PULA 2018

Optometry and Optics for Better Vision

11-13 May CROATIA

Optometry Conference of Central and South-East Europe

European Academy of Optometry and Optics

Book of Abstracts

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

2

Contents

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

PULA2018

Optometry and Optics for Better Vision

11-13 May CROATIA

Keynote Lecture Abstracts

Conjunctival Lesions: Links to Systemic Disease

Thomas F. Freddo

O.D., Ph.D., F.A.A.O.

Adjunct Professor, MCP Health Sciences University

Abstract:

This lecture provides differential diagnostic criteria for congenital and acquired lesions of the conjunctiva, including recommendations for systemic work-ups as indicated. The pathobiology of certain lesions is described to provide context and basis for differential diagnosis.

Learning Objectives:

Conjunctival Lesions.

Understand the histology of the conjunctiva as a means of predicting what lesions can reasonably arise in these tissues.

Understand the clinical significance of the non-uniform distribution of goblet cells in the conjunctiva.

Understand the differential diagnosis of congenital and acquired lesions at or near the limbus.

Understand the differential diagnosis of cystic and pseudocystic appearing lesions.

Understand the differential diagnosis of salmon-colored lesions.

Understand the differential diagnosis of brown/black pigmented lesions.

New opportunities for comfortable Contact Lens wear

Mile Brujic

Premier Vision Group

Abstract:

Contact lenses have advanced significantly in their ability to offer a more comfortable wearing experience. But in the absence of a healthy ocular surface, this becomes a difficult task. This course will discuss the most contemporary perspectives on improving the health of the ocular surface to promote healthy, comfortable contact lens wear. The attendee will be armed for strategies to improve ocular surface health to promote comfortable lens wear through analyzing the most contemporary literature and providing practical applications of those findings.

Sports Vision: Visual training for athletes

Lluïsa Quevedo Junyent

OD, Psychologist, PHD
Polytechnic University of Catalonia
School of Optometry, Terrassa
Olympic Training Center, Sant Cugat del Vallés

Abstract:

Sports coaches, athletes and scientists are constantly in search of new means to enhance sports performance and gain a competitive advantage. Visuo- cognitive skills are crucial performance determinants in most sports, where fast and accurate decisions are required in a complex and rapidly changing environment. Sports vision can be defined as a set of techniques directed to preserve and to enhance visual and perceptual abilities in order to improve sporting performance (Quevedo & Solé, 2010). This optometric specialty englobes various areas of actuation (ocular protection, optical neutralization, specific visual skills evaluation and visual training). The issue of enhancing the visual and visual-motor skills in athletes to boost athletic results has led to several investigations (Clark, Ellis, Bench, Khoury, et al. 2012; Kofsky & Starfield, 1989; McLeod 1991; Quevedo & Solé, 1995; Wimshurst, Sowden & Cardinale, 2012) with different results and conclusions to take into account. Sports vision training programs have a relatively long history of use (Berman 1988; Ericksson 2007; Fullerton 1921; Knudson & Kluka 1997; Schwab & Memmert 2012). However, the past few years with the amazing growth in new digital technologies, we seem to be in front of a new paradigm (Applebaum & Erickson, 2016).

Brain VT Sports Vision, a new online training program based on an artificial intelligence platform has been developed as an internet-based, self-administered visual intervention. Size, shape, color and number and timing of stimulus presentation and response are all customized to the patient's needs. There are a lot of levels according to task difficulty, making ceiling and floor effects unlikely.

Finally we will expose how we employ this technology in our daily clinical practice at the Olympic Training Center in Sant Cugat (Barcelona).

The evidence base for myopia management

Nicola Logan

Aston University, UK

Abstract:

The prevalence of myopia is escalating at an alarming rate worldwide, with 5 billion people expected to be affected worldwide by 2050. Of more concern is that the degree of myopia in the population also appears to be increasing and with this there is an increased risk factor for potentially sight threatening ocular pathologies, including cataract, glaucoma, retinal detachment and myopic maculopathy. The presentation will review current research in myopia development, progression and amelioration. The theory behind the different intervention strategies will be discussed. The efficacy of different myopia control strategies will be presented and their safety profile will be reviewed. Emerging areas of research into myopia control will be explored. Eye care professionals urgently need to reconsider their clinical practice approach in relation to management of myopia which is no longer an optical convenience, but a modifiable risk factor for sight-threatening disease. This presentation will allow an eye care practitioner to better understand the different myopia control interventions currently available to assist them making an evidence based informed decision on what is appropriate for the myopic child.

PULA2018

Optometry and Optics for Better Vision

11-13 May CROATIA

Oral Presentation Abstracts

13

The prominent Secondary Glaucomas

Brett G. Bence

Northwest Eye Surgeons, USA

Abstract:

Pseudoexfolation (PEX) is the most common secondary glaucoma as well as the most frequent unilateral glaucoma. We discuss a 62-year-old female patient who presented with mid-30s monocular intraocular pressure, ipsilateral optic neuropathy, correlating visual field and optical coherence tomography loss, nuclear sclerosis cataract, family history of glaucoma, and pseudoexfoliation. As it turns out, she is of Northern European decent.

We examine the case of a 26-year-old keratoconus patient who had corneal graft surgery. Due to moving across the US for his job, he delayed obtaining an eye examination. With 6 months between examinations and use of topical fluorometholone ophthalmic suspension to prevent rejection, he presented with a painless intraocular pressure of 47mmHg. Distinguishing clinical features included an ipsilateral afferent pupillary defect, incipient PSC cataract, and glaucomatous optic neuropathy. He was diagnosed with steroid-induced secondary glaucoma.

A 37-year-old white male presented with complaint of right more than left mild blurred vision when exercising. He had no other complaints other than moderate myopia and wore glasses. Slit lamp examination showed elevated intraocular pressure of 28 in the right eye, and 22 in the left eye; trans-illumination iris defects OD, Krukenberg's spindle and a prominent Zentmayer ring on the anterior capsule OD, and moderate myopic temporal tilt of the optic disc in the right eye. He was diagnosed with OD pigment dispersion syndrome.

Action:

The pseudoexfoliation glaucoma patient was initially placed on topical glaucoma medications, but did not reach the desired target pressure. She underwent combined cataract surgery with trabeculectomy. Her intraocular pressure improved and diagnostic tests stabilized. The young steroid-induced glaucoma patient was placed on topical glaucoma medications, oral acetazolamide, and suspended from using the corticosteroid. He resumed a "soft" topical steroid, Lotemax®, with glaucoma medications after several weeks. The pigment dispersion syndrome patient showed dense pigment covering the trabecular meshwork as will be highlighted by video gonioscopy. Management included serial tonometry with a 5-8mmHg higher IOT in the OD, equivocal results from RNFL and visual fields, and a debated decision to start treatment with an aqueous suppressant.

Conclusions:

Secondary glaucomas may be more aggressive than POAG and need to be managed accordingly.

Retinal assessment in diabetes: why, what and how

Vibeke Sundling

Buskerud University College, Norway

Abstract:

Diabetes is a global epidemic disease and diabetic retinopathy a potential sight threatening complication. Regular eye examination and treatment of diabetic retinopathy can prevent sight loss. Looking at the potential role of the optometrist in eye care of people with diabetes, this session will give delegates an increased understanding in the area of diagnosis and referral of diabetic retinopathy.

- To improve the understanding of the risk factors for diabetic retinopathy and vision loss
- To improve the understanding of the diagnosis, classification and management of suspect ed diabetic retinopathy
- To improve the understanding of the increasing need for shared care in diabetes eye care

This interactive lecture will discuss the challenges when interpreting retinal digital images and decision-making that follows in people with diabetes. The audience will be presented with several cases and be asked to give their opinion using Kahoot on their mobile phone or tablets.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Peri-Orbital Skin Lesions – A Logical Approach

Thomas F. Freddo

O.D., Ph.D., F.A.A.O.

Adjunct Professor, MCP Health Sciences University, USA

Abstract:

Description: This course allows the clinician to move beyond mere visual recognition of obvious dermatological lesions to an ability to analyze and properly describe skin lesions as a prerequisite to developing a differential diagnosis approach.

Objectives

To identify and describe unique features of peri-orbital skin.

To introduce, define and illustrate the principal terms used to properly describe skin lesions.

To provide a logical approach to differential diagnosis for lesions of similar description (e.g. papillomatous masses).

To review the ABCDE criteria for assessment of pigmented skin lesions.

Should optometrists use ophthalmic medicine?

Josip Čulig

MD, PhD

University of Applied Sciences Velika Gorica, Croatia

Abstract:

Optometry has developed and continues to develop in a different manner and at different rates worldwide. There are some basic principles that can be recognized and are shared by the optometric profession in most countries, such as the need to advance and expand the education of the profession. The range of services in different countries depends equally on state legislation and the professional competences of local optometrists. Most of the professionals in Croatia have achieved the level of 180 ECTS upon the completion of a three years' program. Few of them hold a master's degree from universities outside Croatia. The use of diagnostic ophthalmic medicine by optometrists in Croatia is not allowed.

Discussion:

A course in General Pharmacology gives 3 ECTS points (30 lectures). The main course objective is that the students can upon its successful completion demonstrate fundamental knowledge and insights into general pharmacology. Education for a master's degree in Optometry usually incorporates General Pharmacology (6 ECTS) and Ocular Pharmacology (6 ECTS). The students can describe and demonstrate the understanding of the eye diagnostic agents, among other specific competences.

Why should we use diagnostic medicinal products?

- in case of ocular media and fundus examination:
- to enhance retinal photography; optical coherence tomography;
- refraction through cataracts when the pupils are small;
- cycloplegic refraction;
- if anesthesia is required.

Conclusions:

Optometrists should be certified to use diagnostic medicinal products. Even in the UK, where they gain 12 ECTS during a university program, they should attend a postgraduate course in therapeutics to obtain an official certificate. Obviously, in countries where the university programs contain less pharmacology and clinical pharmacology, such courses should be developed according to the European Diploma. It is important that such courses are developed together with clinical pharmacologists and ophthalmologists under the auspices of the university.

Impact of digital age on optometric practice

Elaine Grisdale[1]

Daniela Nosch[2]

[1]Head of Professional Services and International Development for the Association of British Dispensing Opticians (ABDO)

[2]University of Applied Sciences Northwestern Switzerland (FHNW)

Abstract:

Our increasingly technological world has already changed our society and triggered globalization to an extent that we could not imagine only twenty years ago. What to expect for the next twenty years? Will streets be full of driverless cars, robots serving us in restaurants and at home, treating us in hospitals and looking after us in care homes? It is no longer possible to predict what will change, however one thing is certain, that constant, profound change will happen at an ever increasing speed. We will be challenged to become agile and flexible whilst not losing our ethical values.

What is the immediate impact of the digital age on our optometric profession? The exposé will present an analysis of consumer habits and how we need to get ready for omni-channel integration and augmented reality. There will be discussion of how to use new technology to our advantage and reconsider how we communicate our services.

A number of take home messages will be offered to delegates as a strategy for survival and growth.

News from the TFOS DEWS II Dry Eye Report

Heiko Pult

CEO at Horst Riede GmbH

Dr Heiko Pult - Optometry and Vision Research, Germany

Abstract:

The publication of the Tear Film & Ocular Surface Dry Eye Workshop (TFOS DEWs Report) in 2007 had boosted the understanding, knowledge and research of dry eye. 10 years later this report was fully revised and updated resulting in almost 3 times more pages. The key points of the TFOS DEWS II report are the recent definition of dry eye and diagnoses and management of dry eye. This lecture will present those key information as Dr Heiko Pult is one hand one of the TFOS ambassadors, and on the other hand was co-author of the diagnoses report. Furthermore practical tips will be presented and discussed.

Management of dry eye in practice, considering new management options

Andreas Hartwig

Hartwig Research Center, Heikendorf, Germany
Aston University, Birmingham, England, UK

Abstract:

Globally dry eye disease is the most frequent ocular disease and optometrists are increasingly exposed to patients complaining about dry eyes. Risk factors for dry eye disease can be ocular surgery, contact lenses, systemic diseases such as diabetes, climatic conditions etc. Typically artificial tears are dispensed to relieve ocular discomfort. A variety of other potential solutions is nowadays available to provide good patient care. The therapy needs to be based on a proper diagnosis of the type of dry eye.

In a first instance, artificial tears can lead to a relief. However, artificial tears need to be well chosen and factors such as preservatives need to be considered.

Other options to improve quality of life for patients are lid hygiene, thermal therapy and light therapy. Those approaches aim to improve the quality of the lipid layer of the tear film. Some of those treatments promise effects that last for more than one year.

Nutrition also plays a vital role in the disease and specific supplements can lead to an improvement of the ocular surface. Anti-inflammatory drugs are another option, that are usually prescribed by ophthalmologist.

In case of contact lenses users, specific contact lenses and care regime exist that lead to better wettability of the contact lenses and improved comfort.

Finally, blink frequencies have an impact on the patients' comfort. Therefore, optometrist and ophthalmologists should guide patients to improve their blinking habits.

In summary, a variety of options is available to reduce discomfort in dry eye disease patients. The role of optometrists and ophthalmologists is to guide the patient to the appropriate treatment for each individual suffering from dry eye disease.

Advanced Examination Techniques for the anterior eye

Daniela Oehring

Plymouth University, Plymouth, United Kingdom

Abstract:

In Optometry and primary eye care, both in practice and clinic, many advances have taken place in recent years. Progress is the opposite of standstill. Usually, the term progress is positively occupied: something has developed for the better. Primary eye care and its subspecialties have been at the forefront of medical innovation and have embraced the rapid advances in various technologies, including imaging, data processing, and devices. The last years were no exception. Although the origins of many of these advances began earlier, these years saw them start to take hold by eye care specialists, with the ultimate goal of improving the quality of life for our patients.

Since the medical side of Optometry becomes stronger, the practitioner needs to be informed and updated regarding technological advances. Ophthalmic devices are an essential part of the work of all eye care providers. Not only that patients like gadgets and the communication between practitioner and patient become easier; but technology also allows to record the findings from clinical ocular examination in an objective, reproducible, transmissible and durable manner and thus, allowing an advance diagnosis and monitoring.

The talk will provide an overview of recent developments in anterior eye technology from imaging, IOP monitoring, to the clinical application of anterior ocular biomechanical properties; focussing on the understanding of underlying principles and its clinical use.

Advanced Examination Techniques:

Clinical application of OCT

Holger Dietze

Beuth University of Applied Sciences Berlin, Germany

Abstract:

Optical Coherence Tomography (OCT) is an imaging technique that produces cross-sectional or three-dimensional images of the living eye. It not only supplements the slit lamp and the ophthalmoscope to establish the correct diagnosis but may be used as a safe and efficient screening tool for age related macular degeneration and glaucoma. The talk explains its core technical principles and its major clinical applications in the optometric practice. Emphasis will be put on the OCT report and the principles for its interpretation.

Advanced Examination Techniques:

Interpretation of OCT

Nicholas Romney

Abstract:

Optical Coherence Tomography is simply, the defining clinical technique, of our age. It is the pre-eminent non-invasive method of visualising the eye by optical means and is on the cusp of replacing medical methods such as fundus fluorescein angiography. This presentation is suitable whether you are an optometrist or optician learning more about the eye and clinical techniques, in undertaking imaging alone or in making clinical diagnoses. The presentation will focus on clinical cases where the use of OCT is the defining feature in making a diagnosis. Beginning in the anterior segment the cases will review common and not so common conditions through the posterior pole, retina, macula and optic nerve.

Ophthalmic and contact lens prescribing for sports

Giancarlo Montani

Università del Salento | Unisalento, Italy

Abstract:

In this presentation will be discussed the causes and frequency of eye injuries in sports and recreation activities. Ocular hazards caused by mechanical impact and exposure to harmful electromagnetic radiation will be emphasized along with the need for eye protection. It will outline the basic principles for selection of ophthalmic lens materials and the suitability of various optical devices designed for specific sports. Will be considered the power compensation and decentration required to compensate for dihedral angle associated to some frames indicate for sports protection and the power modification required in swimming goggles or underwater masks. The indication for filter prescription will be considered not only for protection to harmful electromagnetic radiation but also to improve sport performance. It will be also analysed the indication to contact lens use in sports for the ametropic athlete and an overview of factors that should be considered when prescribing contact lenses for those activities. In the final part will be reviewed the guidelines included in the international normative published on "Eye Protection During Sports Activities".

When 'working' eyes are smiling

Fiona Anderson

Abstract:

Today, with the advent of technology; such as computers, tablets, smartphones and the like, our eyes have never before been required to work so hard or at so many different distances, all at the same time!

Our eyes now have to 'work' harder than they have ever done before.

This lecture will cover a review of occupational issues affecting visual health, including visual displays, stress and working positions and the effects of outdoor working and will offer some practical solutions to alleviate the symptoms of visual stress.

Intended Learning Outcomes:

- Practitioners will understand the occupational issues affecting visual health including visual displays, stress and working positions in order to elicit relevant work-related history from the patient.
- Are able to identify the visual symptoms which may be caused by occupational related issues, including VDU and outdoor working, and able to give relevant advice to the patient.
- Ability to advise on the most appropriate optical appliances to meet a range of occupational needs.

Vision in children with special educational needs

Julie Anne Little

Ulster University, Northern Ireland

Abstract:

Children with neurodevelopmental disorders are at increased risk of visual impairment and more commonly have vision problems. This lecture will summarise the key aspects of vision, advise on the assessments and strategies to effectively test individuals who may be non-verbal, and advise on the visual management of these children.

Prismatic corrections – are you getting the correct amount?

Roger Crelier

Head of Institute of Optometry FHNW, Programme Head Optometry BSc
FHNW University of Applied Sciences and Arts Northwestern, Switzerland

Abstract:

Within the eyecare profession, a considerable variety of different measurement con-cepts exists, in order to establish a patient's binocular status and there is also a large variability in when and how prisms are being prescribed. Many different management concepts exist, with regards to vision training as well as to how and when to prescribe prismatic values, particularly as the prismatic amount obtained, depends on the meas-urement technique, of which there a several different ones in use in daily practice.

Most of our used techniques have been around for 50 to 100 years in their origin and each of them mostly follows one single concept. Optometrists believe in their measur-ing system of choice and are often convinced, that theirs is the best and only.

This presentation will discuss the various different concepts in use, as well as current terminology, measuring units and the corresponding philosophies. It will further ex-plore the latest concepts and developments in this area.

Clinical Management of Binocular Vision

John McGann

School of Physics, Dublin Institute of Technology
Dublin, Ireland

Abstract:

As Optometrists we know that heterophoria is very common. In many cases the condition is fully compensated, presenting no difficulties for those affected, however approximately 8% of the population will have decompensated heterophoria with an additional 6% suffering from Convergence Insufficiency (Stidwill, 1997). An earlier study by Daum, published in 1986, found that among exophoric individuals for example, 62% had convergence insufficiency, almost 28% had Basic Exophoria and 10% had Divergence Excess Exophoria. In addition to vergence problems, eyecare practitioners must consider pre-presbyopic accommodative disorders with which they often co-exist.

Individuals affected by decompensated heterophoria will often suffer asthenopic symptoms or may avoid visual tasks which trigger such symptoms. Vergence disorders can be quite subtle in nature, sometimes resulting in an underestimation of their significance. In reality, there can be significant negative effects on an individual's quality of life, often impacting significantly on their academic and work performance. The increasing use of digital devices particularly by teenagers and young adults puts additional strain on their vergence and accommodation systems, making an increase in the prevalence of asthenopic symptoms almost inevitable.

As primary eyecare practitioners Optometrists are well-placed to examine, diagnose and manage these non-strabismic binocular vision anomalies. Once the diagnosis has been made the most appropriate management approach can be decided upon by the practitioner. In some cases combining more than one approach may ultimately be necessary to deal with the asthenopic symptoms.

This lecture will discuss decompensation of heterophoria and the three management approaches (refractive, prismatic and vision therapy) which can be used to restore ocular comfort.

How New Technologies Help us in Optometric Practice

Juan Carlos Ondategui Para

Universitat Politècnica de Catalunya
Barcelona, Catalonia, Spain

Abstract:

In the XXI century, as clinicians we have in front of us a constant growth in the diagnostic instrumentation development, equipment to perform different treatments, materials and solutions for visual and ocular problems. These advances are presentedincrease almost exponentially and we continue to find ourselves in the constant struggle between technological advances and innovation (disruptive or not) and its implementation optometricin optometric practice.

In reference to the technological advances in optometry, we find new devices that allow us to evaluate in greater depth detail the ocular structures. An example is the images obtained by OCT with Swept Source technology, the ability to differentiate structures and information that are capable of processing and analyzing in a few seconds. In the case of corneal topographers that allow analysis of anterior face, posterior face, corneal thickness, corneal aberrations or densitometry of structures.

But it has not only advanced in instrumentation of to measure of ocular structures but in objectively measuring clinical parameters of the visual function as it is the refractive error by means of systems combined with Hartman-Shack aberrometers, such as automating and objectifying the subjective test of refractive error by selecting images in virtual or real scenarios. Or the new equipment that objectively and automatically measures visual responses in different visual environments, with high precision and that can reach alterations in binocularity, accommodation or ocular motility in stages before those usually used in clinical practice. These systems allow us to understand better, what the behavior is of the visual system in front ofunder different visual demandstasks, as well as to plan their treatments through visual therapy.

This lecture will also cover how to manage Optometric Innovation to develop a stronger practice committed with our first goal, to serve our patients with the best skills and facilities we can provide.

In the case of technological advances for treatments that modify eye structures, we should highlight advances in laser technology, such as the femtosecond laser for refractive and cataract surgery, allowing more treatment options and lower risk in the intervention.

Another, totally different issue but as important as or more important than technological advances, is the management of Optometric Innovation. Understanding that innovation is the potential change in the execution of optometric practice where the appearance of new products or services leads to the creation of new markets and can displace existing competitors.

Innovation in Contact Lenses

José M. González-Méijome

University of Minho, Portugal

Abstract:

Innovation in health care is evolving rapidly and the search for different platforms for sensing the function of the human body and administer treatments in a more efficient way has reach the contact lens field. Nanotechnology and biotechnology is expected to expand the role of contact lenses as devices used in a privileged location in direct contact with ocular fluids in the next few years or decades. Measuring glucose concentration, intraocular pressure or dry eye biomarkers might be common uses of contact lenses in the near future. Surface bioengineering has the potential to address some of the major issues with contact lenses including lens discomfort, dryness and microbial interaction.

In parallel, the evolution in the field of material science and technology and advances in micro-optics and microelectronics, offers new alternatives to treat ocular and visual dysfunctions and use contact lenses as interfaces with the real and virtual world. Sophisticated applications related with augmented reality and video recording might be on the way but most relevant in the short term will be the potential applications of smart materials and micro-optical technologies for the correction of presbyopia with accommodating contact lenses or visual rehabilitation with telescopic contact lenses.

Back to the clinical field the role of emerging technologies such as 3D printing, smart-phone embedded visual examination applications or artificial intelligence and big data algorithms on contact lens practice is still to be discovered. Increasing availability of instrumentation in the practitioners hands and more flexible and cost-effective manufacturing technologies might open a route for customization of advanced contact lens designs in specific cases such as irregular ocular surface, presbyopia or myopia control. It is not difficult to envision platforms of communication between patients and practitioners that simultaneously improve compliance with contact lens wear and provide information on potential contact lens related complications.

Contact lens practice will also change significantly over the next few years. New products, new applications and potentially new modes of interaction with our patients need to be considered in our day-to-day routine. Most importantly, the clinician should be updated regularly in a highly dynamic field.

Contact Lenses & Ocular Surface:

CL Quiz

Sebastian Marx

JENVIS Research
Jena, Germany

Abstract:

Modern contact lens systems are known as very healthy and comfortable medical products to correct nearly all kind of ametropia. Nevertheless, there is still a high number of drop-out in the CL wearer population.

Contact lens specialists needs to know a up to date knowledge of the examination techniques and the evaluation of the anterior segment of the eye. A thorough examination should cover all areas of the anterior eye section including the tear film, eyelids, conjunctiva, cornea, iris and lens. Eye care professionals have to be sure in judging pathological findings. They have to decide whether a finding is harmless or needs to be referred for further treatment.

In this interactive presentation, important CL complications are going to be discussed. The audience is interactively embedded in case discussion and can vote for diagnostic options. This lecture provides a convenient opportunity to check and brush up contact lens and anterior eye knowledge.

International Contact Lens Market

Helmer Schweizer

Alcon, Schools of Optometry in Velika Gorica and Novi Sad

Abstract:

This paper presents the European contact lens market, showing where the market came from over time and where it possibly goes to.

It will show the impact that daily disposables have had and still have on the market development, driving penetration of contact lenses.

It will also touch on the most recent developments, like intelligent lenses, myopia control etc.

Topographical diversity and function of retinal cells populations

José M.González-Méijome[1]

Ana I. Amorim-de-Sousa[2]

[1]PhD, University of Minho, Portugal

[2]MSc, University of Minho, Portugal

Abstract:

The human retina is a complex tissue spread over an area of 1100 mm2 where the light is transformed on an electrical sign and the visual information is firstly treated and modulated before gets to the brain. There are 3 types of photoreceptors (L-M-S); 11 different types of bipolar cells (Bc), 3 types of horizontal cells (Hc), 18-25 types of amacrine cells (Ac) and ~23 types of ganglion cells (Gc) in the mammalian retina, including the human species. The center of the fovea is composed mainly by L- and M-cones, with S-cones representing less than 12% of all cones and then decreasing towards periphery. L-and M- cones have their highest density at fovea (~21 000 and 40 000 cells/degree, respectively), while for S-cones at the center of fovea there are ~2500 cells/degree, reaching it maximum density of ~7500 S-cones/degree at approximately 3º from central fovea. Three different types of HC have been described (HI, HII and HIII) and despite the supposed connectivity function described (HI with cones and rods; HII only with cones; HIII L-M cones and alleged with rods), no information about the distribution of the Hc was found in the literature. Eleven types of Bc have been described; 1 directly connected with rods (RB), 7 concerned with information convergence from cones (6 types of diffuse (DB) and 1 type of a giant bistratified (GBB)), and 3 concerned with single-cones contacts in a 1:1 relationship called invaginating (iMBc) and flat (fMBc) midget Bc and the blue-cone Bc (BB). At the center of the fovea there are only iMBc and fMBc connected with L- and M-cones (1iMBc+1fMBc:1cone) till 40º eccentricity. The BB is connected to a single S-cone at fovea but as it moves away start to receive information from 2, 3 or 4 S-cones with a maximum distribution at 3º with ~70 000 BBc/degree. The 6 types of diffuse Bc (DBc) are similarly distributed along the retina with a density of ~2500 cells/mm2 (DB3 and DB6 ~930 cells/mm^2). The GBB is related with S-cones OFF-pathway and is usually connected to ~20 cones pedicles. Its distribution have a peak density of ~140 000 per degree at 1-3ºeccentricity, decreasing to ~37 500 per degree at 20-30º eccentricity. Regarding Ac, there is a lack of information with respect the density and distribution of Ac, however is has been reported from 18 up to 25 different types of Ac along the retina. There have been reported about 23 different types of Gc. Like the Bc, there are invaginating and flat midget/parvocellular Gc (iPGc and fPGc, respectively) responsible for red/green color opponency with a distribution of ~2800 cells/mm2 at 1mm of eccentricity, with a decreasing density up to 280 cells/mm^2 at 15mm from the foveal area. The S-cone Gc (blue/yellow) is a specialized Gc that represents only 3% of all the retinal Gc with a spatial density distribution comparable to the S-cones, with ~400 cells/mm2 at fovea and ~20 cells/mm^2 in more peripheral areas. Another well studied GC is the parasol Gc (MGc), also classified as invaginating (iMGc) and flat (fMGc), and represents ~10% of Gc population, with only 2% of them at fovea, increasing its density to peripheral →

areas (peak density at ~7mm from the nasal fovea with ~3400 cells/mm2 in the macaque retina) with responsibility in detection of movement, depth perception and small changes on brightness. Some authors reported no significant differences in cell density between the four retinal quadrants (nasal, temporal, superior and inferior), while others observed significant differences along the horizontal and vertical meridians, reporting a higher cells density (up to ~1000 cells/mm^2) in the nasal and superior peripheral retina.

Acknowledgement of funding: present study has been partially funded by Fundação para a Ciência e Tecnologia (Portugal) through project PTDC/FIS-OPT/0677/2014 granted to CEORLab and Strategic program UID/FIS/04650/2013 granted to Center of Physics.

Dark Adaptation Techniques: are Practically Relevant to Modern Trials?

Jasleen Jolly

Oxford Eye Hospital, Oxford, UK
Nuffield Laboratory of Ophthalmology, University of Oxford, UK
Moorfields Eye Hospital and UCL Institute of Ophthalmology

Abstract:

Purpose

Dark adaptation is a standard methodology for assessing rod function. The test is undergoing a resurgence as there are an increasing number of clinical trials for the treatment of rod-cone dystrophies. Dark adaptometry is a long process and can be a burden on patients. The FST test (Diagnosys LLC, Cambridge, UK) and the Maculogix® have been developed as alternatives to the Goldman Weekers dark adaptometer for the characterisation of dark adaptation. Scotopic microperimetry techniques are also being developed.

Methods

A group of patients with choroideremia underwent scotopic testing with both full field dark adaptometry and FST using the Espion 2/3 (Diagnosys LLC, Cambridge, UK). A subset of patients underwent localised measurements 5 degrees superior to the fovea using the AdaptDx (Maculogix®, PA, USA). The slope of adaptation over the initial 18 minutes was compared using the 2 techniques. This was performed as part of an ongoing gene therapy trial (NCT02407678). Pilot data has also been collected using the scotopic MAIA.

Results

Three distinct patterns of dark adaptation curves were identified. FST was significantly different between these groups ($P < 0.001$). The FST was well correlated with the final threshold ($r = 0.94$, $P < 0.001$). The Espion dark adaptation threshold at 18 minutes was well correlated with the final threshold ($r = 0.81$, $P < 0.001$). However the Maculogix results did not correlate well with either slope ($P = 0.27$).

Conclusion

The FST is a viable alternative to plotting full dark adaptation curves. The threshold at 18 minutes appears to be related to the final threshold, although it cannot predict it. This indicates that the full adaptation time may not be necessary for the assessment of rod function. The Maculogix conducts measurements over 18 minutes. It may be a viable alternative to the Espion for clinical trials. However, more information is required about the scaling of the dB scale used by the equipment in order to directly compare the methodologies. The Maculogix measurement location did not encompass viable retina in 3 patients so more work is needed around the variability across the retina to allow flexibility with testing regimes. The advantages and disadvantages of each technique will be discussed.

Understanding the Optics of Myopia Control Lenses

José M.González-Méijome[1]
Alessandro Fossetti[2]

[1]PhD, University of Minho, Portugal
[2]IRSOO - Istituto di Ricerca e di Studi in Ottica e Optometria, University of Florence

Abstract:

The mechanisms by which the orthokeratology control of myopia are obtained are still to be fully demonstrated, but the most popular hypothesis is that the effect could be related to the myopic peripheral refraction caused by the corneal molding that creates a ring of great power in mid cornea and thus a myopic annular area on the mid-peripheral retina. This relative peripheral myopization could reduce eye elongation, as demonstrated by the studies of Smith III and other researchers. If the control of myopia could be attributed to the peripheral myopic defocus would be possible to obtain the same result with a progressive center-distance contact lens or with contact lenses having an expressly designed increase in peripheral power.

In effect, positive results on the control of myopia and on the eye axial elongation have been found with the use of both commercially available multifocal soft contact lenses center–distance and dallies contact lenses designed to obtain a relative myopic refraction in the peripheral retina. The amount of these effects are lower than those obtained by orthokeratology, at least for the moment. We could argue if the minor efficacy of soft contact lenses in comparison with orthokeratology has to be attributed to differences in relative peripheral refraction. Future developments in this field would bring to a strong change in the soft contact lens market.

This lecture will present the results of measurement of peripheral refraction with different optical devices that have demonstrated efficacy to reduce axial elongation in children. This information is relevant for the clinician to understand the optical principles involved in the design and the visual impact of these devices.

Implementation of Myopia Control Into Practice

José M.González-Méijome[1]

University of Minho, Portugal

Abstract:

Regulation of axial elongation and associated myopia development is possible through a number of routes including pharmacological, optical interventions and ocular hygiene interventions with different degrees of efficacy. Among the most effective methods, there are several contact lens options including orthokeratology and different soft contact lenses involving specially devised optical designs or multifocal designs initially intended for presbyopia correction. Treatments involving administration of ocular drugs such as atropine at different doses are not available to most primary eye care practitioners across Europe.

This new paradigm requires that we see myopia not only as a visual handicap that can be only corrected with optical or surgical solutions but as a dynamic process that can be managed and regulated to achieve the goal of achieving the minimal axial elongation to minimize the risks of ocular pathology later in life.

Despite the increasing body of evidence supporting these approaches, the clinician still faces several challenges to communicate this new aspect of myopia management to patients (usually children), parents and other eye care practitioners. When considering the possibility of an intervention to regulate myopia progression and not only its correction the clinician has to make several decisions related with the risk of fast and potentially malignant myopization, the appropriate time for initiating the treatment, the method to use, what to expect and how to measure the efficacy of the treatment, what are the potential complications and when to stop the treatment.

This lecture will approach the most challenging questions for the clinician and will guide the primary eye care practitioners for the implementation of a myopia control approach that is compatible with his/her level of expertise and practice profile, from the one with the most sophisticated machinery to measure topographical, dimensional and aberrometric parameters of the eye till the most basically equipped clinic having access only to basic equipment involving refraction and keratometric measurement.

Regulate Visual Demand with Digital Devices

Norberto López-Gil

University of Murcia
Murcia, Spain

Abstract:

Babies are usually born hyperopic, and they are forced to keep most of the day accommodating until they achieve emmetropia after a few years. This emmetropization process is mainly made by means of the axial eye elongation, an easier physiological change than a reduction in optical power. Once the eye reaches emmetropia, if the children spend large amounts of time accommodating (studying, watching video games in a tablet, …), it seems logical that axial elongation continues, until the eye becomes "emmetropic" for the usual near work distance, that is, their eye become myopic. Indeed, although the mechanism that regulates the axial enlogation progression is not still totally understood, there are not doubts that accommodation and near work plays a crucial role in myopia progression. Under this perspective, myopia can be understood as an adaptation to the external conditions rather than a homeostasis failure. However, this adaptation does not always take place, as it shown by the degree of variability in both animal models of myopia and human population, where many children remain hyperopic or emmetropic.

Given the important relationship between myopia and accommodation, together with the actual intense use of children of digital devices (consoles, smart-phones and tablets), it seems important to regulate the visual demand of such devices. Beside the use of cycloplegic agents, the decrease of accommodative effort can be achieved two strategies: or by optical aids (i.e. multifocal contact lenses); or simply forcing the children to be at a minimal distance from the digital device.

The presentation will address the relation between accommodation and myopia progression to present show the actual solutions regarding that second strategy.

Computer Vision Syndrome

Marc Argiles

Universitat Politècnica de Catalunya
Barcelona, Catalonia, Spain

Abstract:

Nowadays, we are living surrounded by screens, we have changed our way of buying, social interacting, learning...all through these screens. However, is our visual system up to the challenges for the new visual skills required? This presentation will revise the concept of Computer Vision Syndrome (CVS), brought about by new screens such tablets and smartphones and the relevance of maintaining an adequate observation distance, avoiding reflexes from the screen and the importance of the eye blink. The screens of the vast majority of electronic devices are now illuminated by LEDs. There are several advantages of this type of light source over its predecessors; however, recent research is giving support to the fact that prolonged exposition to the white LEDs emission in the blue spectrum may have a negative impact on visual health, as well as, on biological rhythms (circadian rhythms) and visual fatigue. As a consequence, ophthalmic lens manufacturers have recently introduced in the market innovative lenses that incorporate blue light filters, specially designed for electronic device users. Various different commercially ophthalmic lenses incorporating a blue light filter will be analysed with regards to absorption and transmission rates. However, not all is bad with regards to the blue light spectrum. Some studies show that blue light might help with attentional resources and cognitive enchantment. So, what's the buzz about the blue light spectrum?

Borders of Aniseikonia for Binocular Vision: Objective and Subjective Evaluation

Petr Veselý[1]

Eva Staffová[1]

Pavel Beneš[1]

[1]Department of Optometry and Orthoptics, Medical Faculty, Masaryk University, BrnoCzech Republic.

Abstract:

Purpose:

Our aim was to define objective and subjective borders (deteriorated by size lens-induced aniseikonia) for comfortable binocular vision in a group of young healthy subjects.

Methods:

Patients were assigned into two groups. Sample A consisted of 117 healthy subjects with an average age of 25 years. Sample B consisted of 56 healthy subjects with an average age of 32 years. In sample A, we measured changes in stereoscopy parallax with a Random dot stereotest, caused by size lenses from 8 to 0%. In sample B, we provided the subjects with a questionnaire of 6 basic questions. The answers were used to evaluate the subjective border of aniseikonia for comfortable binocular vision.

Results:

In sample A, the objective border for comfortable binocular vision was shown to be at 5% of aniseikonia. This value is in agreement with previous studies. However, the exponential dependence between aniseikonia and stereoscopy parallax is a novel observation. In sample B, the subjective border for comfortable binocular vision was found to be higher than 5%, but lower than 5.5%.

Conclusion:

In this study, we have identified the objective border for comfortable binocular vision (5%), and an exponential dependency between stereoscopy parallax and aniseikonia. This function allows the prediction of the effect of aniseikonia on binocular vision. For subjective evaluation of comfortable binocular vision, we defined a new level that is higher than 5%, but lower than 5.5% of aniseikonia.

Retinal Gene Therapy and the Future Impact on Optometry

Jasleen Jolly[1]

Robert Maclaren[1]

[1]Nuffield Laboratory of Ophthalmology & Oxford Biomedical Research Centre, University of Oxford, Oxford, UK

[2]Oxford Eye Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom

Abstract:

Clinical topic:

Retinal gene therapy for inherited retinal degeneration is fast becoming a clinical reality. Gene therapy for Lebers Congenital Amaurosis was recently approved by the US Food and Drug Administration (FDA) and the programme in Oxford for Choroideremia is entering phase 3 trials. As gene therapy enters the therapeutic domain, optometry will become more involved in both the screening and follow up of patients with inherited retinal degenerations and needs to be aware of the important aspects of vision as well as the possible pitfalls.

Actions taken:

We have been developing protocols for visual function testing in patients with inherited retinal degenerations, in order to take into account not only of the vision loss but also the aspects of vision likely to be affected by gene therapy. Conventional tests are not typically robust to changes due to noise or difficulties performing the tests secondary to visual field loss. For example visual acuity becomes a problem due to localisation of the line and electronic methods help to provide more stable measurements. Microperimetry is more sensitive in the area being treated by gene therapy than conventional perimetry due to the tracking of eye movements during testing.

Recommendations:

Advice on testing visual acuity, colour vision, visual field and scotopic visual function testing will be provided for optometrists likely to see patients with inherited retinal degeneration in the future.

Complications and Compliance in over-the-Counter Versus Fitted Contact Lens Wearers

Liat Gantz[1], Eyal Gal[1], Barry Weissman[2], Rim Tarbia[1], Hadeel Agabrea[1]
Malaki Mattar[1], Ayat Abu Ahmad[1], Yara Jabaly[1], Einat Shneor[1]

[1]Department of Optometry and Vision Science, Hadassah Academic College, Jerusalem, Israel

[2]Southern California College of Optometry at Marshall B Ketchum Univeristy, Fullerton CA, and Stein Eye Institute, D Geffen School of Medicine at UCLA, Los Angeles CA.

Abstract:

Purpose:

In the State of Israel, contact lenses (CLs) may be legally purchased over the counter (OTC). However, incorrect fitting and usage of CLs may lead to ocular discomfort and to corneal infections. This study compared soft CL users who purchased contact lenses OTC (OTC_CL) to users who were fit and followed up in optometry practices (F_CL).

Methods:

Healthy soft CL wearers were recruited from two optometry practices and through ads. The study was approved by the institutional review board and subjects signed a consent form prior to their participation. Examiners filled out an online form with Likert-type scale including health history, contact lens usage information, current corneal, lid and sclera condition (based on slit lamp examination), tear film quality, contact lens fit, and Snellen monocular and binocular distance visual acuity. Outcomes from OTC_CL and F_CL were compared using one-way ANOVA and Chi Squared tests with a significance level of 0.05.

Results:

There were 43 participants in the F_CL group (mean age 25.33± 4.12, range: 18-35, 35 female), and 41 in the OTC_CL group (mean age: 28.49±6.70, range: 18-43, 31 female) with no significant difference between them. Ocular complications were significantly lower in the F_CL group ($F(df=1,82) = 13.07$, $p< 0.001$). Namely, meibomian gland disorder ($p=0.02$), corneal neovascularization ($p=0.007$), corneal staining ($p=0.03$), and giant papillary conjunctivitis ($p=0.00$). Lens fit was significantly better ($F(df=1,82)=5.02$, $p< 0.05$) in the F_CL group with significant differences between lens overall diameter ($p=0.03$) and optical power ($p=0.03$). There was no overall effect of handling and compliance, but there was a significant difference between hand washing prior to lens handling ($p =0.01$).

Conclusion:

Findings demonstrate that OTC_CL wearers suffer from more complications, wear lenses that are not well fit, and are less compliant with hand washing. Results of a larger cohort of this study should be brought to health regulation bodies to reexamine the current structure of contact lens sales in Israel.

Active and Interactive Learning

Dinah Paritzky

Hadassah Academic College

Abstract:

In 2018 most optometry programs are looking to actively involve students in the learning process (constructivism), and to move away from the passive lecture mode 1. Active learning will in turn encourage lifelong learning 2.

As educators who were trained in the old fashioned mode, many of us struggle with how to achieve this goal. This presentation will be a fully interactive session in order to demonstrate the use of the following tools (depending on time allowance), and how they may be used in optometric education:

Kahoot
Socrative
Answergarden
Participoll
Plickers
Quizlet
Edpuzzle

If we provide students with only the basic information, then they will suffer from a huge gap in the knowledge and skills they need to function well in twenty-first-century workplaces. In order to be effective citizens, workers, and leaders in society, students also need practice with critical thinking, communication, collaboration, and working creatively3.

Technology can help classrooms be more like real-world environments and better prepare students to enter an increasingly connected and globally-competitive workforce. There are many technologies that can help teachers streamline daily processes and increase opportunities to incorporate critical thinking, communication, collaboration, and creativity into students' learning.4

Using these tools during a lecture enables the lecturer to achieve the following even with very large groups:

immediate interaction with all students
individual feedback
encourage creativity
develop lateral thinking
use Problem-Based learning
use Case-Based learning

Educators must be up to date with current technologies in order to be relevant to their students and to improve the effectiveness of their teaching. This in turn will encourage active learning which will enable life long learning.

Clinical Applications of Prosthetic Contact Lenses: a Case Series

Chun Ki Wong

School of Optometry, The Hong Kong Polytechnic University

Abstract:

Background:

Four patients, aged between 49-57, presented to our Optometry clinic for eye examination. Two of them had ocular trauma resulting in corneal break and iris disfiguration. One was referred for contact lens fitting because of the hazy cornea in on eye secondary to Diabetes. The last one complained sudden onset of diplopia and would like to find a temporary method for patching one eye since no underlying cause of diplopia can be identified. All of them reported difficulty in performing daily activities such as going outdoor and driving.

Action Taken:

All of the patients were fitted with Oculus Flexcon Prosthetic Colored iris (HVID 10.5mm). First two patients were fitted with clear pupil while the others were with opaque pupil (pupil size 3mm). The iris color of the prosthetic lenses was decided according to their fellow eye so as to reduce the variation between two eyes.

First two patient reported significant improvement in their visual discomfort due to glare and photophobia. One of them showed visual acuity improvement from 6/38 to 6/15. Third case regained a normal eye appearance while the last case had successfully blocked the diplopic image. Patients' appearance before and after prosthetic lenses wear were well documented. Subsequent aftercares showed stable lens performance and good ocular conditions. All of them were satisfied with the contact lens performance.

Recommendations & Conclusion:

Iris-painted contact lenses are frequently used in a wide range of anterior eye problems for both sighted and non-sighted eyes. The clinical applications of prosthetic contact lenses can be functional or purely cosmetic. Management on patients required prosthetic lenses and considerations during fitting procedure will be discussed.

Study had aslo shown the use of prosthetic contact lens could significantly improve the social relationships and well-being of patients. In these few cases, patients have problem in performing their daily activities and restriction in social life. With the use of prosthetic lenses, they could regain their normal life. Thus, practitioners should not hesitate in fitting prosthetic lens.

Video Gonioscopy

Brett Bence

Northwest Eye Surgeons

Abstract:

Case presentations:

We examine 4 cases of anterior chamber angle disease with gonioscopy video, 2 patients with traumatic angle recession and 2 patients with peripheral anterior synechiae.

Traumatic angle recession. Patient A is a 78-year-old male with a history of ocular trauma, a snowball injury, in his mid-teenage years. At the time, he was told he had "blood in his eye". Examination showed angle recession of 75 percent of his angle. Fibrosis is evident posterior to the scleral spur and in the anatomical ciliary body band. Patient B is a 34-year-old female who presented following a blunt ocular injury with a bungee cord. She suffered traumatic iritis with 20% pooled hyphema of the anterior chamber. After the blood cleared, gonioscopy showed focal angle recession of 1-2 clock hours with dense pigment.

Peripheral anterior synechiae (PAS). Patient C is a 42-year-old patient with a 15+ year history of poorly-controlled type 2 diabetes mellitus, and co-morbid risk factors of hypertension and smoking. With a presenting complaint of reduced vision, the examination showed proliferative diabetic retinopathy with macular edema. Gonioscopy demonstrated iris rubeosis, PAS in 2 quadrants, and normal intraocular pressure. Patient D is an 81-year-old new patient requesting refill of his eye medications. He was taking 1% prednisolone acetate and timolol. The examination showed dense iris rubeosis with nearly 360 degrees of PAS on gonioscopy. Less than one clock hour of TM was distinguished. He had a hypermature cataract and intraocular pressure of 44mg.

Actions taken:

Patient A has traumatic glaucoma and is managed with topical aqueous suppressant medications. Patient B is being watched as a glaucoma suspect with no medications. Patient C was referred to a retinal specialist for Avastin intravitreal injection and pan-retinal photocoagulation. Patient D suffers from ischemic central retinal vein occlusion and was scheduled for transscleral cyclophotocoagulation to lower the intraocular pressure.

Recommendations/conclusion:

Gonioscopy is an integral clinical tool in the diagnosis and management of glaucoma. In these video cases, gonioscopy was an important adjunctive procedure to help identify and/or confirm the working diagnosis. Establishing the angle grade by corneal focal lines will be discussed as time allows.

Visual Functions in Keratoconus Patients with Relation to Severity Stages of the Disease

Ravid Doron [1], Liron Levi [1], Yulia Pernikov [1]
Riki Greenberger [1], Einat Shneor[1]

[1]Department of Optometry and Vision Science,
Hadassah Academic College, Jerusalem, Israel

Abstract:

Purpose:

Keratoconus (KC) is a corneal disease that may leads to severe visual impairments. Subjects with KC can often have normal VA but suffer from poor quality of vision such as light scatter. Several studies suggested that KC subjects present lower contrast sensitivity (CS) compared to healthy subjects but the magnitude of the reduction and the link to severity are varied in the literature. Moreover, Crowding effect (CE) has not been studied yet in relation to KC. The aim of this study was to examine how and if CS and CE change in KC patients with relation to the progression stages of the disease using psychophysics measurements and compare these functions to normal healthy control.

Methods:

KC was diagnosed based on abnormal topography and tomography, and at least on one clinical signs. KC severity was defined according to the Amsler-Krumeich classification. Healthy controls subjects have been matched to KC by age, gender and refractive error. The study was approved by the institutional review board and subjects signed a consent form prior to their participation. VA, auto refraction and over refraction correction test were performed. CS and CE of KC and controls were tested using psychophysical tests, and were compared and correlate to the severity of the disease.

Results:

9 KC subjects (7 eyes in stage 1, 2 eyes in stage 2, mean age of 23±3.84 years) and 9 healthy subjects (mean age of 26±0.70 years) have participated in the study. Significant difference was shown for KC compared to controls for Cyl ($p=0.004$), for the thinnest site of the cornea ($p=0.014$) and for CS ($p=0.002$, $p=0.05$, $p=0.04$ for 6, 9 and 12 cpd respectively). No difference was found between KC and control eyes for CE. No correlation was found between KC severity and for thickness to CS and CE.

Conclusion:

At the early stage of the disease, KC subjects, show significant lower CS in all frequencies compared to healthy subjects. Further investigation of visual parameters in different stages of the diseadse may provide a better understanding of the progression of the disease.

Low Vision Case Study of a Patient With Macular Degeneration

Jennifer Brower

Association of British Dispensing Opticians

Abstract:

The presentation is a mix of text slides and photographs and is a study of a female patient aged seventy-four years of age with macular degeneration and diabetes. The presenter will discuss the clinical cause of the loss of vision and its effects on vision, the assessment routine, consideration of the patient's visual needs and personal wishes, and the significance of the spectacle correction, magnification, illumination, monocular and binocular vision, details of the low vision aids supplied, and an appropriate aftercare regime.

Results:

By the end of the presentation delegates should understand the basic principles of low vision assessment for a patient with macular degeneration and the priority which must be given to a patient's individual needs. They will appreciate the importance of regular refraction, and understand the relationship between the pathology and the suitability of different types of low vision aids. Delegates will also understand the reasons for providing magnifiers of different types and powers for specific tasks.

Recommendations:

Optometrists and dispensing opticians wishing to undertake low vision work will be able to use this study as an example of how a common low vision pathology can affect a patient's ability to perform everyday tasks such as reading, writing, shopping or travelling. By listening to the patient's particular needs, for essential visual tasks and personal hobbies, and understanding the challenges that low vision patients have to contend with on a daily basis, we can provide effective solutions and encourage more involvement in this field.

Clinical Evaluation of Higher add Bifocal Soft Contact Lens to Control Axial Length Growth in Myopic Children

Langis Michaud[1]
Patrick Simard[1]
Marcotte-Collard Remy[1]

[1]Universite de Montreal

Abstract:

Purpose:

The evaluate the efficacy of a new soft multifocal contact lens design, with a high add power, for myopia and axial length management

Methods:

This is a prospective, randomized, clinical cross-over study. 24 subjects (aged 8-12) were recruited to participate. They were progressive myopic (0.50 to 6D). All were virgin to contact lens wear. Once enrolled, participants were randomly fitted on one eye with a soft bifocal lens, designed with a +5.00D add power surrounding a central zone correcting a refractive error at distance. The second eye was fitted with a spherical lens, made of a similar material and serving as a control. After six months, lenses were crossed-over.

Results:

The clinical population is made of 14 girls and ten boys, average age of 10.5 + 1.2 y.o. Caucasian represent 70% of the participants, Asian 30%. Visual acuity at distance was 6/6 or better for all participants, for each eye tested. Binocular vision did not show any abnormal findings. Refractive error was -2.37 + -0.62 D in average.

After six months, the test eye showed no significant axial length progression. Control eye progressed of at least 0.1 mm. Cycloplegic refraction was stable in the eye wearing bifocal lenses. Spherical aberrations induced by the test lens was significantly higher compared to the naked eye or the control. Ocular health remained within normal limit.

Discussion:

This study, with an innovative approach for customizing central distance zone, proved that it is very feasible to wear a lens with a +5D add power while keeping normal visual acuity at distance and at near, normal accommodative response and increasing positive spherical aberrations.

Conclusion:

A higher add power (+5D) multifocal soft lens, customized, can be used to effectively control axial length growth in young myopic patients, with no negative impact on distance vision, natural accommodation and increases significantly the level of positive spherical aberrations.

Scleral Lens Fitting in Regular and Irregular Cornea: a Case Series

Jimmy Sung Hei Tse

School of Optometry, The Hong Kong Polytechnic University

Abstract:

Clinical topic:

To report two cases of scleral lenses fitting in a high myopic patient and a moderate keratoconus patient.

Case presentation and actions taken:

A 57-year-old high myopic female presented to our clinic for RGP lens replacement. Her habitual lenses were about 20 years old and were significantly warped.

Conventional corneal RGP lenses with different designs and diameters were fitted to the patient. However, all of them were decentered and bound onto the cornea inferiorly because of the patient's tight eye lid. Scleral RGP lenses were then refitted in both eyes. Optimal visual acuity and corneal integrity were achieved.

A 27-year-old male presented to our clinic for contact lens fitting. Corneal topographical measurement revealed moderate keratoconus OD and mild keratoconus OS. RGP lenses were fitted successfully for him, however he decided to stop contact lens wear due to comfort intolerance. He returned to our clinic two years later with significant keratoconus progression OD. He complained severe visual quality reduction and loss of depth perception. Due to his corneal RGP intolerance history, scleral lens and disposable SCL was fitted to his OD and OS respectively. Lens performance, subjective feeling and corneal health condition were optimal during the subsequent aftercare consultations.

Conclusion:

With the design advancements, Scleral lenses are now becoming more and more common in the contact lens practice. With proper scleral support, Scleral RGP lenses often provides good centration and comfort as they are designed to rest on the less sensitive sclera, and will not affected by the asymmetric or irregular corneal surface, tear quality and lid force.

Apart from lens centration and comfort, with adequate vaulting, scleral lens can be fitted on eyes with keratoconus without inducing any bearing on cornea and protecting the corneal surface from mechanical damage, the tear reservoir itself can also neutralizes most of the irregular astigmatism, therefore, lens fitting, corneal health and visual performance of the patient can be significantly improved. The fitting philosophy of scleral lenses will be discussed in the presentation.

Soft contact lenses for keratoconus and irregular corneas

David Berkow

Berkow Optometrists

Abstract:

Background:

Not all irregular corneas need to be fitted with a scleral or semi-scleral gas permeable contact lens or a Rigid Gas Permeable (RGP) contact lens or a piggyback solution.

Content:

One such solution is a specially designed soft contact lens which is produced in either a Hydrogel material or a Silicone Hydrogel material. This lens is manufactured in Israel and exported to many countries.

The lens has a unique design, including "pressure balancing holes" which allow for improved tear flow, improved oxygen permeability, avoid air bubbles and give way to improved stabilized vision.

Another unique feature when fitting this lens is the ability to fit it using the sag. measurements taken with the corneal topographer.

Another feature of this lens is that it may be produced in a toric form (front toric).

This presentation will describe in detail the fitting technique of this lens using both "K" readings and also sag. measurements.

Results:

Clinical tests show that the improved comfort gives way to greater wearing time. 56% of patients fitted with this lens achieved over 12 hours of continuous wear.

Best Corrected Visual Acuity: 74.5% of patients showed an improvement of 2 lines or more when wearing this lens compared to the best corrected spectacle correction.

44% showed an improvement of 3 lines or more.

Recommendations:

I have been fitting this lens for over 2 years with extremely positive results in cases where the irregularities of the cornea are not extreme and in those cases where the patient has difficulty inserting and/or removing a scleral lens or cannot tolerate an RGP corneal lens.

Tears And Fears

David Berkow

Berkow Optometrists

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Abstract:

There are many issues that need attention when examining the contact lens patient.

This presentation will look at the influence of the contact lens on the tear film. It has been demonstrated that in the absence of the contact lens there are fewer complaints of discomfort or eye irritation.

Discussion:

Under normal circumstances the components of the tear film work together to lubricate, moisturize, smooth oxygenate, clean and protect the ocular surface during and between blinks. Unfortunately the presence of a contact lens can change the tear-film structure and the interaction between the contact lens and ocular surface. This may affect the quality of a patient's contact lens wearing experience.

This presentation will explain what comprises the tear film, its function, the rupture of the tear film-how and why. The mechanism of tear exchange and how the contact lens can interfere with and interrupt tear exchange will be explained in detail.

Another aspect addressed in this presentation is the function of each component in the tear film (lipids, proteins, mucin and electrolytes) and how each component may be affected by the influence of the contact lens on the tear film and the biochemical changes caused by the influence of the contact lens on the tear film.

The presentation will explain in detail how to evaluate, clinically, lens-tear interaction (e.g. lipid layer interferometry, tear meniscus height, tear osmolarity, tear break-up time and more).

Recommendations:

Try to assess accurately the cause of the problem. This may be an incorrectly fitting lens, lens modulus, incorrect biocompatibility of the lens material and tear film. Another important issue to address is the tear exchange under the lens. Look carefully for deposits on the lens surface which may upset normal homeostasis and disrupt normal tear function. Define the nature of these deposits (e.g. calcium, protein, lipids etc.) and eliminate them.

An Automated and Objective Cover Test to Measure Phoria

Clara Mestre[1], Carles Otero[1], Fernando Díaz-Doutón[2]
Josselin Gautier[3], Jaume Pujol[1]

[1]Davalor Research Center (dRC). Universitat Politècnica de Catalunya, Terrassa, Spain.
[2]Centre for Sensors, Instruments and Systems Development (CD6). Universitat Politècnica de Cataluna, Terrassa, Spain.
[3]Inria, Biovision Team, Sophia Antipolis, France.

Abstract:

Purpose:

To determine the repeatability of an automated and objective cover test to measure phoria and its agreement with the prism cover test (PCT) and the modified Thorington test (TH). The effect of ocular dominance on the magnitude of phoria was analysed.

Methods:

Two occluders comprising two crossed polarizers driven by stepper motors covered the right (RE) and left (LE) eye alternately while participants fixated a 20/50 Snellen E at 40cm. The EyeLink 1000 Plus (SR-Research) registered eye movements. The test sequence consisted of three cycles of binocular fixation, LE occlusion, binocular fixation and RE occlusion. Each period lasted 5 seconds. Phoria was computed as the deviation of the occluded and fixating eyes from their previous binocular positions. It was repeated in two sessions with a rest of 40 minutes. Phoria was also measured with the PCT and the TH at the beginning of the first session. Ocular dominance was assessed with the Hole-in-the-Card test.

Results:

30 non-presbyopic adults participated in the study. The mean accuracy ±SD of eye-tracker's recordings was 0.27°±0.10°. The mean difference of phoria between sessions ±SD was 0.15±0.79 prism diopters (PD) ($p=0.32$). The direction of phoria was not significantly different with the three tests (Chi-square, $p<0.05$ for the three pairs of methods) nor its magnitude (Repeated measures ANOVA, $p=0.71$). The 95% limits of agreement of the automated and objective cover test were ±7.47 PD and ±5.23 PD compared with the PCT and the TH, respectively. Phoria was significantly smaller in the RE than in the LE with a mean ±SD of -0.96±1.07 PD ($p<0.001$). The effect of ocular dominance was not significant ($p=0.20$).

Conclusion:

Advantages of using eye-trackers to measure phoria are: the measure is objective and with better resolution and repeatability than clinical methods, and movements of the occluded eye can be registered. As eye-trackers become common tools in clinical settings, their use for automated and objective phoria measurement should be the new gold standard for the cover test.

Vision and Road Safety: Putting the Brakes on a Global Public Health Threat

Kristan Gross

Vision Impact Institute

Abstract:

Introduction:

Uncorrected vision continues to endanger the lives of drivers, passengers, and pedestrians around the world. Compounded by external factors such as nighttime driving, inclement weather, and adverse road conditions, uncorrected vision contributes to more than 1.25 million road accident deaths each year.[i] Until recently, the intersection of vision and road safety has not received adequate attention. Consequently, there is a lack of awareness around the need to prioritize uncorrected vision and address the impact of vision problems on driver and road safety. While governments and organizations can play a significant role in driving greater awareness of this public health threat, optometrists and ophthalmologists are also part of the solution because of their direct access to patients in need of vision care.

Key takeaways:

Vision impairment and road safety has not been prioritized in the public health space.

Nighttime conditions create greater vision problems for drivers including refractive blur, hazard detection and avoidance, gap detection, swerving, etc.[ii]

Optometrists and ophthalmologists play a crucial role in vision and road safety, and must be educated and equipped to provide their patients with the best vision care

Conclusion:

It is imperative that we address vision problems and their impact on the safety of drivers, passengers, and pedestrians. Because twenty-three percent of drivers globally suffer from uncorrected vision, we must find solutions that span all countries and demographics.[i] Vision standards for driving must be a priority, and the development and implementation of these standards should not fall solely on local, state and national governments, but also on eye care professionals around the world. As we work towards our goal of expanding access to proper vision care around the world, our success will hinge on the collaboration between stakeholders to identify solutions that will improve driver vision, equip medical professionals with the information and resources they need and, ultimately, ensure road safety for drivers everywhere.

Non-Mydriatic Fundus Imaging With a Smartphone: Influence of Patient Age

Juan Carlos Ondategui Parra[1], Maria Ballesta Sierra[2], Alba Campí Sanou[2]

[1]Universitat Politécnica de Catalunya - Centre for Sensors, Instruments and Systems Development (CD6), Terrassa, Barcelona, Spain.

[2]Universitat Politécnica de Catalunya – Centre Universitari de la Visió (CUV), Terrassa, Barcelona, Spain

Abstract:

Purpose:

The aim of the study is to assesses the quality of photographic records of fundus images obtained with the Smartphone system (iExaminer) adapted to a conventional ophthalmoscope (Panoptic) compared to a system of static retinal photography (retinography) for different groups of age.

Method:

The design of the study is observational, cross-sectional and cases non-consecutive.

A sample of 80 subject underwent a clinical exam at University Vision Centre in Terrassa. This sample has been divided into three different age groups: 23 subjects youth group (YG), 30 subjects adult group (AG) and 27 subjects senior group (SG). Both eyes were measured randomly for each patient with iExaminer and iExaminer app, and the conventional retinography TRC-NW6S (TOPCON). Images were evaluated for each of the systems. Finally, all patients surveyed valuation of the two systems

Results:

The age of the YG (Mean ± sd) was 26,23±4,27 years; for AG was 48,50±4,32 years and for SG was 66,85±6,93 years. Pupillary diameter in the YG for right eye (Mean ± sd) was 3,52±0,89 and 3,46±0,91 for the left eye. For AD, right eye was 3,27±0,77 and 3,27±0,77 for left eye. Right eye's SG was 2,91±0,70 and 2,86±0,71 for the left eye.

The results show that the same criteria for evaluating images graded between the devices for evaluate, and the conventional retinography, there is a statistically significant difference in the young group but not at senior's group. Regarding the satisfaction of the usability there are no significant differences of the any questions or age group.

Conclusion:

The iExaminer with the application is a mobile and portable suitable on urban environments as complementing the work done in a cabinet optometry and ophthalmology

The quality of images recorded with iExaminer, with no dilated pupils, are accepted as valid for a study of the fundus eye, according to the correlation results obtained between the two systems

In adult and senior patients, the evaluation of the fundus eye images shows similar results between iExaminer and conventional retinography.

The final overall patients' satisfaction against iExaminer is positive for all age groups.

Review of biometric changes with presbyopia as explanation for differences in near addition among equal age groups

Karola Panke[1], Martins Zeidaks[2], Aiga Svede[1]

[1]Department of Optometry and Vision Science, University of Latvia, Riga, Latvia

[2]Institute of Technical Physics, Riga Technical University, Riga, Latvia

Abstract:

Purpose:

After age of 45 people start to have problems to see clearly in near distances due to presbyopia. Changes of human eye with age is challenging topic in clinical vision science, because there are a lot of individual factors that can slow or accelerate development of presbyopia. The aim of this paper is to take a closer look at theoretical additive norms expected for age and see if they are useful and reliable in optometry practice.

Methods:

We reviewed 216 patient data provided from eight optometrists and analysed 5 parametrs – age, basic refraction diagnosis, near acuity with distance correction (data available from 178 patients), amount of required addition and visual acuity with addition.

Results:

Our results show tight linear correlation ($r=0.73$, $p< 0.05$) between age and amount of near addition. Despite that average values are in a good agreement with data from 70'ties when Borish defined average near addition values for age (Borish, 1970), we would like to highlight that their usability for patients are limited because of individual differences between individuals. For example, in addition norm table made by Borish addition 2.00 D are associated with 60 years, but in our results we can see that addition amount of 2.00 D can be present from age 50 to 75 years old patients. While in age of 60 we estimated that individual differences in near addition can be from 1.25 D till 2.25 D.

Conclusion:

Factors influencing presbyopia development include increase in straylight, decrease in stiffness gradient in crystalline lens, decrease in eye's refractive index, increase in lens thickness, both anterior and posterior curvatures of lens decrease, decrease in anterior chamber depth, increase in lens weight and changes in lens biochemical composition – content of water, electrolytes, proteins, calcium and natrium. Thus presbyopia for each individual can manifest in different amount and age therefore classical near addition norm values should be used carefully. We provide new normal values where broadened addition data are represented that can be used as a support when prescribing near addition in order to increase eye care specialist's job efficiency and precision.

Objective Measurement of Astigmatism Induced by Decentration of a Bifocal Contact Lens

António Miranda[1], Rute Macedo-De-Araújo[1], Ana Amorim-De-Sousa[1]

Sofia Peixoto-De-Matos[1], José Manuel González Méijome[1]

[1]CEORLab, Center of Physics, University of Minho 4710-057 Braga, Portugal

Abstract:

Research abstract:

Purpose: Dual-focus contact lenses are used as myopia control devices and have demonstrated efficacy to reduce axial elongation. When perfectly centered with the pupil they provide at least two focus at distance and approximately 50 cms but centration cannot be warranted in all fittings what might impact the optical performance of these devices. The purpose of this experiment is to evaluate the effect of lens decentration on the optical performance and induced astigmatism measured with objective methods.

Methods:

A bifocal contact lens used for myopia control with constant power of -0.50D and +2.00D of treatment power was fitted to 6 eyes (28±5 years of age) in this pilot study. Decentration of the CL was measured with the E300 corneal topographer (Medmont. Australia), Aberrometry was measured with the IRx3 Shack-Hartmann aberrometer (Imagineyes, France) for 5 and 3 mm of pupil size, and autorefraction was measured with the WAM5500 (Grand-Seiko, Japan). The residual refraction of subjects was compensated on a Badal optometer adapted to the autorefractometer or the internal optics of the aberrometer. All measures were performed without and with the contact lens in place. The experiment respected the tenets of the Declaration of Helsinki. Statistical analysis was conducted using non-parametric tests to compare repeated measures and to conduct correlation analysis.

Results:

Ocular astigmatism measured without lenses was -0.50±0.21D (range: -0.10 to -1.31D). On average the lenses decentered by 0.54±0.29mm from the pupillary center (range: 0.25 to 1.0 mm); in all eyes, lenses decentered in the temporal or temporal-superior direction. Ocular astigmatism measured with lenses was -1.39±0.17D (range: -1.02 to -1.89D). Interestingly, all with-the-rule astigmatic eyes changed to against-the-rule with the contact lens in place, what is expected from the predominantly horizontal decentration of the optic zone of the lens.

Conclusion:

Corneal topography over the bifocal soft contact lens allows to objectively estimate the decentration with respect to the pupil center. Decentration induces changes in optical performance and increase astigmatism measured with aberrometry for 5 and 3 mm and with autorefractometer.

The Repeatability of Lid Parallel Conjunctival Folds and Lid Wiper Epitheliopathy

Heiko Pult

Optometry & Vision Research, Weinheim, Germany;
School of Biomedical & Life Sciences, Cardiff University, Cardiff, UK;
Ophthalmic Research Group, Life and Health Sciences, Aston University, Birmingham, UK

Abstract:

Purpose:

In the past decade of years, lid parallel conjunctival folds (LICPOF) and lid-wiper epitheliopathy (LWE) has shown to be promising new dry eye tests. Classic dry eye tests are criticized to be unrepeatable (Nichols J. et al. 2004), when being observed over a couple of weeks. However, those data are unknown in LIPCOF and LWE. This study investigated the repeatability of LIPCOF and LWE over a period of one month.

Methods:

LIPCOF and LWE of both eyes of 30 volunteers (female: 21, mean age 32.7 ±9.4 years) were evaluated at day 1 (V1), day 14 (V2) and day 28 (V3). LIPCOF was classified using the Pult scale. Temporal and nasal scores were summarized to LIPCOF Sum. LWE was examined using fluorescein and lissamine green and classified by the Korb scale. Repeatability between visits was analysed by Kappa statistic, intra class coefficient (ICC) and limits of agreement (LoA) as 1.96 x standard deviation.

Results:

Mean LIPCOF Sum grade at V1 was 1.8 ±1.0 and 0.98 ±0.87 for LWE. Kappa between visits for LIPCOF Sum was 0.28 and 0.23 ($p<0.001$; VI – VII and VI - VIII, respectively) and for LWE 0.12 ($p=0.059$) and 0.11 ($p=0.092$). 95% LoA for the differences between visits was 2.18 and 2.04 for LIPCOF Sum and 1.92 and 1.82 for LWE (VI – VII and VI - VIII, respectively). ICC for LIPCOF Sum was 0.802 and 0.730 and 0.685 and 0.628 for LWE ($p<0.001$; VI – VII and VI - VIII, respectively).

Conclusion:

Repeatability of LIPCOF and especially of LWE was limited. However, ICC of LIPCOF and LWE was better as published values of tear meniscus height, tear break up time, Schirmer or phenol red thread test.

The Development and Evaluation of the New Ocular Surface Disease Index-6

Heiko Pult[1]

James Wolffsohn[2]

[1]Optometry & Vision Research, Weinheim, Germany;
School of Biomedical & Life Sciences, Cardiff University, Cardiff, UK;
Ophthalmic Research Group, Life and Health Sciences, Aston University, Birmingham, UK
[2]Ophthalmic Research Group, Life and Health Sciences, Aston University, Birmingham, UK

Abstract:

Purpose:

The Ocular Surface Disease Index (OSDI) is a well-known dry eye questionnaire, used in numerous clinical trials. However, some clinicians claim it being slightly to long and calculation of the final dry eye score may be time consuming. Furthermore some questions, as for example ‚blurry vision' and ‚poor vision', sounds similar to many patients. This study investigated a shorter version of the OSDI with a simplified scoring system, named the OSDI-6.

Methods:

264 completed OSDI (female: 174; mean age: 34.4 ±12.3yrs, mean OSDI score: 13.1 ±11.5) were evaluated by regression analyses to detect the most predictive 2 questions of each of the 3 sub-categories of the OSDI. The resulting 6 questions (Q) were combined to the new OSDI-6. The coefficients of the equation of the regression analyses were rounded. Based on this, the OSDI-6 total score was calculated by following formula: OSDI-6 = 1xQ1 + 2xQ2 + 1xQ3 + 2xQ4 + 1xQ5 + 2xQ6. The ability of the OSDI-6 to predict the OSDI diagnoses (cut-off value 13) was analysed by receiver operative characteristic curve (ROC). Infits and outfits of the single questionnaire were analysed by RASCH analyses. Correlation between OSDI and OSDI-6 were analysed by Pearson correlation.

Results:

The OSDI-6 was significantly correlated to the OSDI ($r=0.902$, $p< 0.001$). Area under the curve of the OSDI-6 was 0.958 (sensitivity=0.943, specificity=0.820, cut-off value 3.5). Infits and outfits were between 1.26 and 0.78 (STRATA=3) for the OSDI-6 and between 1.68 and 0.57 (STRATA=4) for the OSDI.

Conclusion:

The OSDI-6 seems to be a good alternative questionnaire to the OSDI in clinical practice. It can be easily and quickly completed, giving a calculated score predictive of the longer OSDI questionnaire.

Toric Periphery Multi-Curve - Designed Corneal Rgp Lens Fitting in a Keratoconus Patient: a Case Report

Man Chi Yee

School of Optometry, The Hong Kong Polytechnic University

Abstract:

Background:

A twenty-four years old young man came to our clinic reported blurry vision at left eye one year ago and denied any vision improvement by habitual spectacle. He reported eye dryness and fatigue especially after prolonged reading and computer usage. General health was found unremarkable except mild allergic rhinitis without long term medication.

Ocular findings:

Keratoconus was found mild at right eye and moderate at left eye. Spectacle correction could not give an acceptable vision for patient dealing with daily activities. Contact lens fitting was suggested for better vision. Topographic data and pachymetric data were taken.

Actions taken

Contact lens fitting:

In contact lend trial fitting section, a multi-curve corneal rigid gas permeable (RGP) lens designed for Keratoconus was fitted in both eyes. Different base curves were tried on eyes. The final pair of lenses was ordered with toric periphery design as with- the- rule astigmatism made the lens tighter in 3 and 9 o'clock lens periphery. The lens was delivered to patient after teaching on lens handling and care regimen. The patient satisfied with the contact lens comfort and vision. The visual acuity improved significantly. Ocular health was found unremarkable after consecutive aftercare visits. Regular follow up was suggested in order to monitor the progression of Keratoconus.

Conclusion:

Practitioners can help patients with Keratoconus by assessing the ocular condition and giving proper advices on management. In this case, the quality of life of the young keratoconic patient can be improved by prescribing customized RGP contact lens as he can see much better. Advanced fitting options such as toric periphery curves design were available in most RGP lens brands for Keratoconus. Practitioners should get more familiar with the proper adjustment on contact lens modification. It can definitely enhance the lens fit, stability, comfort and visual quality.

A Review of Wales Optometry Postgraduate Education Centre Educational Training and Assessment to Eye Care Practitioners in England from its Inception in 2010 to the End of 2017

Sasha Macken

Wales Optometry Postgraduate Education Centre, School of Optometry and Vision Sciences, Cardiff University.

Abstract:

Educational topic/area:

A review of Wales Optometry Postgraduate Education Centre (WOPEC) educational training and assessment to eye care practitioners in England from its inception in 2010 to the end of 2017.

Results/discussion:

Data details uptake and successful completion of 6 online learning modules delivered by WOPEC in conjunction with Local Optical Committee Support Unit (LOCSU): Minor Eye Conditions Scheme (MECS); Glaucoma Repeated Measures (GRM); Cataract; Learning Disabilities; Low Vision and Paediatrics.

MECS is the most popular in the series and, to date, 6083 practitioners have successfully completed the lectures. Learning Disabilities and Low Vision modules receive lower accomplishment rates with overall 316 and 198 practitioners respectively, even considering their availability to dispensing opticians and optometrists.

For the MECS and GRM modules, WOPEC offers an Objective Structured Clinical Examination (OSCE) style assessment so that competencies and practical skills can be demonstrated to commissioning bodies. Completion rate of MECS and GRM online lecture modules and their event assessment demonstrate an increase every year, Assessment completion totals 4392 for MECS and 2510 for GRM to date.

The MECS assessments involves 5 stations, testing practical skills such as Volk lens assessment, communication and patient related competencies. The Glaucoma Repeated Measures require optometrists to demonstrate skills; Volk lens assessment, Van Herick's anterior chamber angle assessment and Goldmann applanation tonometry, as well as a written short answer glaucoma case study.

Over a recent 12 month period WOPEC event results for both MECS and Glaucoma were reviewed. 777 practitioners undertook MECS OCSE assessment at 43 events. 91.1% passed all 5 stations. Of the 69 practitioners who received an overall fail, 54 failed the Volk station and 15 failed 2 or more of other stations and would require a re-sit at a future event. ➞

Recommendations/conclusion:

A large number of practitioners have completed online learning with WOPEC indicating their commitment to enhanced eye care services. Additionally, a significant number also underwent practical assessments. Further work is required to encourage uptake of particular modules. Practitioners fail certain assessments and further analysis is required to determine if improvement could be made in delivery of the station or training prior to event.

Contact Lens Wear in 2000 Students Between 17 and 25 Years of Age Entering University in 2015, 2016 and 2017

José M. González-Méijome[1], Paulo Fernandes[1], Rute J. Macedo-De-Araújo[1]
Ana R. Vaz[1], Daniela Lopes-Ferreira[1], Ana I. Amorim-De-Sousa[1]
António Queirós[1]

[1]CEORLab, Center of Physics, Unviersity of Minho, Portugal

Abstract:

Purpose:

The purpose of the present work was to analyze the prevalence of contact lens wear in the new students between 17 and 25 years of age, and the factors related with this prescription.

Methods:

A random sample of 2027 students entering the University for the first time between 2015 and 2017 was recruited, representing approximately 25% of the new students entering the University of Minho. Data collection respected the tenets of the Declaration of Helsinki and was evaluated and approved by the Ethics Subcommittee for Life and Health Sciences. Statistical analysis was conducted using non-parametric tests to compare repeated measures and to conduct correlation analysis and Chi square test to compare proportions between groups (i.e. by gender). Results: Of the 2027 surveyed, 1911 met the age criteria and answered the questions related to contact lens wear (94%). Their average age was 18.7±1.1 years (63% females; 37% males) and the last visual exam had been done 2.2±2.3 years ago (range: 0 to 13 years). Of the subjects evaluated, 42% used some mode of visual correction while 2% referred that they needed visual correction but didn't use it regularly. Prescriptions were performed in a hospital in 19% of cases, in an optical shop in 25% and in an ophthalmology clinic in 56%. Fourteen percent (14%) of the subjects wear contact lenses, 8% states they don't like the idea of wearing contact lenses and 6% answered that they could not adapt to contact lenses. The responses were not different ($p>0.05$) between males and females. Myopic prescription was the most frequent, being present in 95% of the cases.

Conclusion:

Nearly half of the students entering the university report to use visual correction, and majority of the prescriptions being done by ophthalmologists. Contact lens wear prevalence in this cohort of young adults is significantly higher (by two-fold) compared to the use of this modality of visual correction in the general population in Portugal and myopia is the main reason. The place where the patients receive their prescription showed an effect on the prevalence of contact lens wear.

Changes in Ocular Accommodation with Bifocal Contact Lenses With Continuous Viewing and Intermittent Visual Deprivation Between Target Vergences

José M. González-Méijome[1], António Miranda[1], Ana I. Amorim-De-Sousa[1]
Rute J. Macedo-De-Araújo[1], Sofia C. Peixoto-De-Matos[1]

[1]CEORLab, Center of Physics, Unviversity of Minho, Braga, Portugal

Abstract:

Purpose:

The response of accommodation system to bifocal and multifocal contact lenses in non-presbyopic subjects has been subjected to analysis with contradictory results. Theoretical models predict that for intermediate or near vision targets, the eye should not accommodate to obtain the maximum image quality. The purpose of this study was to evaluate the accommodative activity at different target vergences.

Methods:

This is a pilot study involving 6 right eyes of six adult subjects (28±5 years) with at least 4 D of accommodative amplitude. A transiluminated high contrast logMAR 0.3 acuity was used as target. Vergence was changed at 0 D, 1D, 2D, 3D and 4 D using a Badal lens (focal=150mm) at 140 mm from the pupil plane and an auxiliary lens (focal=200mm) to keep approximately constant luminance of the target through the system and minimal magnification changes. Accommodative response was recorded without contact lens, and with the bifocal contact lens using two approaches. In the first one the subject was viewing the target while the Badal system was changing vergence (Continuous), while in the second one, vision was deprived between vergence changes (Intermittent). Five consecutive autorefraction measures were recorded in a custom-made software (DRRE, CEORLab, University of Minho) 3 seconds after blinking and/or eye opening. The experiment respected the tenets of the Declaration of Helsinki. Statistical analysis was conducted using non-parametric tests to compare repeated measures and to conduct correlation analysis.

Results:

Under the 3 conditions (no lens, Continuous and Intermittent), the accommodative response was highly correlated with the vergence change ($r^2>0.900$; $p< 0.01$) with diferences within ±0.50D between vergence change (demand) accommodative activity (response). There was no difference between accommodation under Continuous viewing or Intermittent viewing during vergence change ($p>0.05$ for all vergences).

Conclusion:

The results from this pilot study suggest that bifocal contact lenses do not affect the accommodative response of non-presbyopic eyes for targets between 1 meter and 25 cms. These results indirectly indicate that the visual system ignores the near focus and continues guiding accommodation through the distance focus.

Implementation of a New Profession in Republic of Moldova - Optometry

Ala Paduca[1], Irene Langeggen[2], Jan Richard Bruenech[2]
Bente Monica Aakre[2], Magnar Sommerstad[2], Hans Bjorn Bakketeig[3]
Eugeniu Bendelic[1], Valeriu Cusnir[1], Tatiana Ghidirimschi[4]
Lilia Dumbraveanu[1], Olga Cernetchi[1], Silvia Stratulat[1], Gheorghe Placinta[1]
Viorica Macovei[1]

[1]State University of Medicine and Pharmacy Nicolae Testemitanu
[2]University College of Sautheast Norway
[3]Hjelp Moldova
[4]Low Vision Center of Moldova

Abstract:

Educational area:

Traditionally, only ophthalmologists and opticians were engaged in eye healthcare in the Republic of Moldova. Although the quality of services offered is overall relatively high, it is clear that the system faces several difficulties. Besides all, the Republic of Moldova was the first country in Europe where the RAAB + DR survey was conducted in 2012, which showed that almost 96.2% of vision impairment in the population aged 50 years and over is treatable or avoidable. The wide range of avoidable visual impairment and blindness together with the high costs of training ophthalmologists lead to the introduction of a new profession – optometrist. This possibility became real thanks to the Eurasia Project "Moldova – Norwegian collaboration program in optometry. Enhancing primary eye health care in Moldova" - which was developed by the University College of Southeast Norway and Nicolae Testemitanu State University of Medicine and Pharmacy in 2016.

Results/Discussion:

The project aims is to establish a sustainable academic education for Optometrists at Nicolae Testemitanu State University of Medicine and Pharmacy, focusing on competence deficiencies in optometry education to the European Diploma in Optometry - with 4 years of study and 240 credits. Due to the valuable support of our partners USN and Help Moldova the implementation of this project succeeded and started from the 1st of September 2017. Our University has 17 students enrolled in the Optometry Program. The integration of highly educated four year trained optometrists into primary health services is a practical means of correcting refractive error, detecting ocular disease, enabling co-managed care between ophthalmologists and optometrists. It is expected that highly trained optometrists will play a vital role in increasing the level of primary eye care services in our country.

Conclusion:

The implementation of a new profession – optometrist in the Republic of Moldova augurs well in order to achieve the goal of eliminating avoidable blindness by 2020. Four-year trained optometrists can make a major contribution to eye care in a more convenient and cost effective way at a community level.

Validation of the Objective Evaluation of Bulbar Conjunctival Redness in Healthy And Diseased Eyes

Daniela Oehring[1]

Kathleen Kunert[2]

Wolfgang Sickenberger[2]

[1]Facultiy of Healthy and Human Sciences, Plymouth University, Plymouth, United Kingdom

[2]Sci-Tec, Ernst-Abbe Hochschule Jena, Jena, Germany

Abstract:

Increased conjunctival blood flow is symptomatic for a wide range of ocular diseases including MGD conjunctivitis, diabetes and glaucoma. Thus, assessing of the conjunctival redness (CR) is fundamental to primary eye care. To simplify documentation, grading scales have been developed; which are highly subjective. A recent development of the Keratograph 5M (K5M; Oculus) introduced automated evaluation of CR by the R-Scan. The study aimed to validate the objective grading of bulbar and limbal CR utilizing the R-Scan.

In this prospective study CR was assessed in 25 subjects (51% female, aged [33.9 ± 15.7]years, 48% dry eye) using the K5M. One eye was chosen randomly and captured using the K5M. The same picture was evaluated objectively and subjectively by 35 primary eye care practitioners (80% Optometrists, 20% Ophthalmologists). Each picture was subjectively evaluated 3x randomly. Bulbar CR was assessed in total, nasal (N), temporal (T) as well as limbal within five severity levels (Grade 0 [G0; normal] to Grade 4 [G4; severe], 25 increments per grade). Descriptive analyses were used for initial results, RM-one-way ANOVA to identify significant differences between grading levels and concordance was evaluated using Pearson\'s correlation coefficient and ICC(3k).

The difference between subjective and objective grading for total bulbar CR was found to be significantly different: the difference within G0 was (-0.1±0.11), G1(0.2±0.23), G2(0.1±0.32), G3(0.8±1.4), G4(-0.1±0.11). G0 and G1 were graded significantly higher subjectively than objectively. Within the segments of the limbal area, the CR was significantly higher subjectively within G1 (T [-0.4±0.24]; N [0.4±0.22]). Significant correlations were found between subjective and objective measurements within all CR assessments ($r>0.7$, $p< 0.05$; ICC>0.75, CA>0.83).

This study is the first comparing objective CR-grading with objective CR-grading over the full range of possible findings within a clinical setting. It could be shown, that the R-Scan evaluates the level of redness similar to experienced professionals. These findings show that CR can be classified quick and objectively using automated technique.

Comparison of Dry Eye Status Before and after Lasik or Implantation of Visian Icl

Peter Gierow[1]

Magdalena Hellman[1]

Petra Hansson[1]

[1]Linnaeus University

Abstract:

Purpose:

The aim of the study was to compare the dry eye status of patients before and three weeks after they underwent LASIK or implantation of Visian Implantable Collamer Lens (ICL).

Methods:

11 patients underwent LASIK and 6 had the ICL:s inserted. All were examined with regard to the tear film lipid layer, tear meniscus and non-invasive break up time (NIBUT) using a Tearscope Plus (Keeler) at the day of surgery and three weeks later. Both eyes were examined. The patients were at both occasions asked to fill out a questionnaire (OSDI, Allergan). A 5-step grading scale was used both for the lipid layer and the lower tear meniscus. NIBUT was measured from the last blink to the appearance of a discontinuity in the tear film. The results before and after surgery were analysed by paired Student´s t-test.

Results:

No significant changes were observed in the lipid layer (2.9 +/- 0.6 before LASIK and 2.8 +/- 0.8 after vs 2.9 +/- 0.7 and 2.6 +/- 0.5 for ICL). Both the tear meniscus and NIBUT were reduced significantly for LASIK (2.5 +/- 1.3 to 1.8 +/- 1.3; $p<0.05$ and from 20.1 +/- 8.6 to 13.9 +/- 9.8 s; $p<0.05$), respectively. No significant changes were observed for the ICL patients (2.5 +/- 1.2 to 2.1 +/- 1.0 and from 16.8 +/- 6.7 to 20.3 +/- 8.9 s). A significant change was also observed in the OSDI score, from 4.2 +/- 3.2 to 15.1 +/- 10.1 ($p<0.01$) in LASIK-group, no significant changes were observed in the ICL group (17.0 +/- 13.2 to 10.1 +/- 10.2).

Conclusion:

Our results show that significant changes can be observed in the tear meniscus volume and tear stability three weeks after LASIK. A significant change was also observed using a subjective questionnaire. No significant changes could be observed in the lipid layer. No significant changes were found in the ICL group, perhaps indicating that this procedure affects dry eye status less.

Implementing a Multidisciplinary Vision Screening Tool in Acute Stroke Rehabilitation Using Knowledge Translation

Helle Falkenberg[1]

Torgeir Mathisen[1]

Grethe Eilertsen[1]

Heidi Ormstad[1]

Irene Langeggen[1]

[1]University College of Southeast Norway

Abstract:

Purpose:

To improve outcomes in stroke survivors by implementing structured vision rehabilitation in multidisciplinary stroke units.

Method:

A multidisciplinary clinical vision screening tool (CROSS) was developed using knowledge translation framework. The CROSS-tool included symptoms, habitual monocular VA and peripheral visual fields, ocular motor function, driving and vision advice, and was implemented in two stroke units after a multidisciplinary competence building course. To evaluate the CROSS-tool, the results were compared to an extended visual eye exam preformed 6-12 weeks post stroke by an authorized optometrist at the National centre for optics, vision and eye care, University college of Southeast Norway.

Results:

11 female (68,4, +/-14,1 yrs) and 29 male (64,1, +/- 13 yrs) stroke patients were examined. The CROSS-tool identified 17 patients with visual problems, including 8 reading difficulties, 17 reduced visual field, 8 binocular problems and 3 with visual neglect. The eye exam revealed 11 with reduced visual acuity, 12 reduced visual field, 5 binocular problems and 1 with neglect.

Conclusion:

Overall, there was a good agreement between the CROSS-tool and the eye examination. The multidisciplinary CROSS-tool can identify visual problems in stroke patients. Further, optometrist can contribute in vision rehabilitation after stroke. However, future research to ascertain validity is needed to ensure vision is considered in all aspects of rehabilitation after stroke.

Refractive and Biometric Parameters in a Portuguese Population of 850 Young Adults Entering University of Minho in 2017

Ana R. Vaz[1], Antonio Miranda[1], Rute J. Macedo-De-Araújo[1]
Daniela Lopes-Ferreira[1], Erna Vukalic[1], Daliborka Roknic[1]
Masa Kangler[1], Sofia C. Peixoto-De-Matos[1], Ana I. Amorim-De-Sousa[1]
André Amorim[1], Jorge Jorge[1], Paulo Fernandes[1], António Queirós[1]
José M. González-Méijome[1]

[1]CEORLab, University of Minho, Center of Physics, Braga, Portugal

Abstract:

Purpose: There is a present trend towards early onset myopia and an increasing proportion of the population is wearing some visual correction from very early in life. Previous studies in this geographical area found myopia prevalence from 5% at the age of 6 to 12% at the age of 9, nearly 17% at the age of 14. The purpose of this study was to evaluate the refractive and biometric data of subjects entering the university for the first time. Methods: A random sample of 850 students entering the University for the first time was recruited, representing approximately 30% of the new students entering the University of Minho. After reading and accepting the informed consent, they were subjective to autorefractometry, biometry and keratometry using non-invasive methods. To avoid involuntary accommodation under non-cycloplegic conditions, an open field auto-refractometer was used (WAM5500, Grand Seiko, Japan). The axial length (AL) and corneal curvature were measured with the IOL Master (Zeiss, Germany). The protocol was compliant with the Declaration of Helsinki and was approved by the Ethics Subcommittee for Life and Health Sciences. Statistical analysis was conducted using paired sample T-test and ANOVA. Results: Average age was 17±5 years (63% females; 37% males) and the last visual exam had been done 2.2±2.3 years ago (range: 0 to 13 years). Myopia criterion defined as spherical equivalent (M) <= -0.75 was present in 30% when right and left eyes were separately analyzed. Emmetropia criterion with M between -0.74 and -0.49 was met by 55% of the subjects and hyperopia of +0.50 or higher was present in 20%. Anisometropia higher than 2D and 1D was present in 1% and 3% of the population. Average M and axial length was -1.97±1D and 24.5±1.0mm for myopes, 0.05±0.8D and 23.5±0.8mm for emmetropes, 0.95±0.8D and 23.0±0.8mm for hyperopes (ANOVA with Bonferroni post-hoc test, p>0.001, all comparisons). Conclusion: Myopia affects over 30% of 17 to 25 year old students entering the superior education in Portugal. This values represent an increase over previous evaluations conducted in previous 5 years and are associated with an elongation of the axial length.

Keratoconus and Presbyopia: Multifocal Contact Lens Solutions for Keratoconic Patients

Gustav Pöltner

Institut Miller Contactlinsen, Innsbruck; VVR - University of Applied Sciences Velika Gorica; FHG-Innsbruck

Abstract:

Reading glasses cannot be our only one solution, if our Keratocone client becomes presbyop. In this practical case reports, different multifocal and bifocal systems, in combination with rotation symmetric, toric- and quadrantic-symmetric back-geometries will be shown. How to fit, what are the critical skills and how was the customer satisfaction, will be discussed.

Does Prism Order Affect Vertical Fusional Ranges?

Liat Gantz[1], Natalie Shaw[1], Chanie Loring Rand[1], Adina Guttermann [1]
Sara Elana Friedman[1], Ravid Doron[1], Einat Shneor[1]

[1] Department of Optometry and Vision Science, Hadassah Academic College, Jerusalem, Israel

Abstract:

Purpose:

The order of horizontal prism presentation (base-out vs. base-in) has been shown to affect the results of horizontal fusional reserves testing, likely due to the relationship between accommodation and convergence. However, prism presentation order has not been tested for vertical fusional reserves, which have a smaller range and do not involve accommodation. This study examined the effect of vertical prism order (base-up (BU) vs. base-down (BD)) on vertical fusional reserves.

Methods:

30 subjects with normal binocular vision (mean age: 22.6±1.93, range: 20-29, 7 male) were randomized into BU first/ BD second, or BD first/ BU second testing groups. Smooth (phoropter) and step (prism-bar) vertical fusional ranges (reserves) were measured by masked examiners with an hour between each testing method. Break and recovery values of the two testing groups were compared using a three-way repeated measures ANOVA, with order (BU first or second and vice versa), test method (smooth or step), and prism type (BU/BD) as factors.

Results:

There was a significant interaction between prism type (BU/BD) and prism order ($F(df=1,29)=29$, $p=0.00$) with post hoc testing indicating that the results for BU and BD break values differed between the two orders. There was also a significant interaction between prism type and test method ($F(df=1,29)=4.27$, $p\leq0.05$) with post hoc testing indicating that the results of the BU break values were significantly different between the step and smooth methods. BU recovery values and BD recovery values were significantly different ($F(df=1,29)=7.68$, $p=0.01$). There was a significant interaction between prism type and prism order ($F(df=1,29)=9.72$, $p=0.00$) with post hoc indicating that the BU and BD recovery values were only significantly different when the BU was presented first, and not when the BD was presented first. However, all differences were less than 1Δ, which is not clinically significant.

Conclusion:

All statistically significant effects were not clinically significant. Therefore, it cannot be concluded that prism order affects the measurement of vertical fusional reserves.

Effects of Different Contact Lens Design on Accommodative Function And Binocular Vision of Young Adult Subjects.

Giancarlo Montani

Università del Salento

Abstract:

Purpose:

To assess the effects of one daily hydrogel single vision contact lens and one daily hydrogel CL for correction of presbyopia, with an "extended depth of focus" design, on accommodation and near binocular vision functions of young adult subjects.

Methods:

Eighteen young adults with distance high contrast VA ≤0,00logMar spherical refractive error between +3,00 and -3,00D, refractive astigmatism <0,50D and esophoria at near were selected. The following accommodative functions were measured: amplitude and accommodative accuracy at 40 cm, negative and positive relative accommodation (NRA/PRA), and accommodative facility (FA). Measurements were carried out during wear of a daily hydrogel single vision CL (Fusion 1Day, Safilens) and a daily hydrogel CL for correction of presbyopia (Fusion 1Day Presbyo, Safilens). The power of single vision lenses were determined based on subjective refraction (maximum amount of spherical plus power for best VA). The power of CLs for correction of presbyopia were selected more positive or less negative by 0,50D, compared to the single vision CL. In addition, heterophoria at near (NP), fixation disparity (FD), stereopsis and VA were recorded for distance and near.

Results:

All subject selected for the study were asymptomatic and within an age range of 18-30 years. No statistically significant difference between the single vision and "extended depth of focus" CLs neither for distance nor for near were obtained for NRA, PRA, FD and stereopsis ($p>0,05$). A small but statistically significant change of accommodation accuracy, with reduction in LAG, was observed with the presbyopia CL (0,23±0.12D; $p<0,05$), as well as an increase in FA (1,4±0,37 cycles per min $p<0,05$) and in amplitude of accommodation (1,19±0,47D; $p<0,05$) and a shifts of NP in exo direction (0,94±0.28Δ; $p<0,05$).

Conclusion:

The data obtained in this pilot study suggest that the CL for correction of presbyopia applied in young adults may influence accommodative functions and a reduction in near convergence, when an increase of positive power by 0,50D for distance vision was applied. These effects on accommodative function and near convergence occurred without significant effects on VA compared with single vision CLs, hence potentially providing a benefit in the management of digital eyestrain.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Challenges and Solutions Related to Mobility of the Optometry Credential

Jeffrey Weaver[1]

Erin Brooks[1]

[1]College of Optometry, University of Missouri-St. Louis

Abstract:

Educational topic or area:

The human population is becoming increasingly mobile. For the profession of optometry to have enough mobility to be a truly global workforce, it is important to have a mechanism to verify the competence of optometrists through an industry recognized credential that can be carried across national borders. In Europe, the European Diploma in Optometry was developed as an accreditation program with high standards with multiple goals, one of which was to support the free movement of optometrists around Europe. Such a process on an even larger scale would be beneficial if it allowed mobility of optometrists across the globe. We propose such a program based on the ISO/IEC 17024 standard for personnel certification programmes.

Results/Discussion:

In 2012, the ISO (the international organization for standardization) released an updated standard to harmonize the various procedures used around the world for certifying the competence of personnel in different occupations or professions. ISO/IEC 17024:2012 Conformity assessment – General requirements for bodies operating certification of persons, provided guidance toward a global benchmark for personnel certification programmes to ensure that they operate in a consistent, comparable and reliable manner worldwide, allowing individuals to have skills that translate across national lines. Optometrists pursue credentials to demonstrate their knowledge, skills and abilities to perform the work of the profession. A program accredited under ISO/IEC 17024 should increase the potential for national and international reciprocity of the optometry credential.

Recommendations/Conclusion:

To address the growing need for mobility of the optometry credential, the profession should consider a worldwide optometry assessment program based on the requirements of ISO/IEC 17024. The program could be based much on the work already accomplished in the European Diploma of Optometry, but expanded for global purposes.

Changes in Relative Peripheral Refraction, Hoas and Optical Quality Using a Soft Radial Refractive Gradient Multifocal Contact Lens with Different Additions and Optical Zones

Giancarlo Montani[1]

Pascal Blaser[2]

[1]Università del Salento

[2]SwissLens

Abstract:

Purpose:

The purpose of this study was to investigate the changes in relative peripheral refraction (RPR) across the horizontal visual field and the effects on high order aberrations (HOAs) and objective optical quality induced by a radial refractive gradient CL that produces peripheral myopic defocus (MD), with different additions and central distant optical zones.

Methods:

Fifteen young adults (range age 20–26 years) with spherical refractive error of -0.50 to -4.00D participated. In each participant's RE non-cycloplegic axial (ARE) and peripheral refractive error (PRE) at 10, 20 and 30° temporally and nasally from the line of sight was measured using an open-field autorefractor and with the measurements transposed in vectors (M, J0 and J45) RPR values were calculated by subtracting ARE from PRE values. Ocular wavefront aberrations for a pupillary diameter of 4mm were measured, along the line of sight and the RMS of coma, spherical aberration (SA) and HOAs were determined. Optical quality was measured also considering the Strehl ratio (SR). All measurement was repeated using custom made soft CLs with different centre distance diameter (CDD) (3.50/4.50/5.50mm) and different additions (+1.50/+2.50D) introduced by a peripheral polynomial progression.

Results:

When uncorrected all eyes presented an average hyperopic RPR for M across all eccentricities with the higher values at 30° (N +1.21±0.29D and T +1.06±0.38D). When corrected with CLs the RPR values presented a MD, highest with 2,5D adds with a reduction of this effect with the increase of CCD (3,5mm N +1.90±0.39D and T +1.32±0.46D, 5,5mm N +1.74±0.49D and T +0.98±0.42D). The CCD changes the position of maximum MS from 10° with 3,5mm to 30° for 5,5mm. CLs use induced an increase in RMS for HOAS, horizontal and vertical coma and positive SA and a reduction of SR with a higher effect for 3,5mm CCD and 2,5D add CL and lower for 5,5mm CCD and 1,5D add CL.

Conclusion:

In conclusion, the CLs tested are effective to introduce a peripheral MD. To obtain the best balance between the higher MD with lower HOAs increase and optical quality reduction it suggested the use of 2,50dt addition with 4,5mm CCD.

Closing Gaps in Optometry Curricula to Meet the Accreditation Standards of the European Diploma of Optometry

Ellen Svarverud[1], Vidyut Rajhans[2], Dinah Paritsky [3]
Bente Monica Aakre[1], Ariela Gordon-Shaag[3]

[1]Department of Optometry, Radiography and Lighting Design, University College of Southeast Norway
[2]Department of Optometry, Manipal University
[3]Deptartment of Optometry, Hadassah Academic College

Abstract:

Educational topic or area:

OCULUS is an Erasmus+ funded international consortium of schools of optometry (SO) in Europe, Israel and India. The main goal of OCULUS is curriculum reform so that its members meet the accreditation standards of the European Diploma of Optometry, administered by the European Council of Optometry and Optics (ECOO). Five schools of optometry completed the European Diploma self assessment process and received benchmarking reports from ECOO, which identified gaps between their curricula and the European Diploma. The gaps were primarily in teaching and assessment of clinical competencies. This abstract describes strategies for gap-closure.

Results:

Each of the Israeli and Indian institutions was assigned a mentor from a European SO that had already received accreditation. Together they created a pedagogical transformation plan aimed at closing the gaps. The plans were developed and finalized at a workshop in London and at a consortium meeting in India. Best practices were shared between all the members and common strategies were formed.

The following four reasons for clinical gaps were identified: 1. Faculty did not possess the skills and/or equipment to teach certain clinical procedures especially in the area of investigative techniques; 2. Assessment of clinical competencies was not carried out with clear criteria for pass/fail; 3. The SO did not ensure that every student was exposed to all the required patient groups; 4. Optometry students did not keep a detailed log book monitored by clinical instructors/faculty. Train-the-trainer workshops were designed to fill the gaps in investigative techniques and assessment of clinical competencies. Ways of bridging the gaps in terms of patient encounters such as grand-rounds for exposure to patients have been planned. Meditrek, a commercial electronic log book, has been modified to meet the needs of the European Diploma.

Conclusion:

All of the competencies to fill the gaps in the curricula of the five SO are being filled by mentorship from best practices within the consortium. The Erasmus+ funding has enabled us to share clinical competencies and strategies for filling the gap.

Flexible Education and Flipped Classroom: Professional Development and Continuing Education in Optometry

Vibeke Sundling[1], Ellen Svarverud[1], Tove Lise Morisbakk[1], Bente Monica Aakre[1]

[1]National centre for optics, vision and eye care, Department of optometry, radiography and lighting design, Faculty of health and social sciences, University College of Southeast Norway

Abstract:

The scope of practice and competence of optometrists differs within and between European countries necessitating the availability of continuing education. Flexible education facilitates professional development and continuing education, independent of time, place, and work- and life situation. The use of digital learning resources and flipped classroom facilitates active learning and teacher-supported student activities such as case reports, laboratory assignments, problem solving and discussions that provide deeper insights and skills, as well as reflection in relation to relevance, implication and application of acquired knowledge to clinical practice.

Results/Discussion:

The Department of optometry, radiography and lighting design, University College of Southeast Norway has developed three flexible continuing education courses (each 15 ECTS). The courses have received financial support from the Norwegian Agency for Digital Learning in Higher Education, which is an agency, established and supported by the Norwegian government and the Ministry of Education and Research. These courses offer Norwegian optometrists who do not have education at the current national level the opportunity to acquire competence to perform the scope of practice at the level required by Norwegian Health Authorities today (Level 3 Ocular Diagnostic Services). The courses are also available for foreign optometrists seeking authorization in Norway.

Two of the courses provide the competency to requisite and use ocular diagnostic drugs and the third course the competency to fit contact lenses. The ocular diagnostic courses are offered in Norwegian and English, whereas the contact lens course is currently only available in Norwegian. The courses have a high completion rate (92%). In the period 2015-2017, 97 optometrists successfully completed one or more of the courses. The students' feedback is positive, in particular with regard to flexibility and learning modes. Generally, they enjoy the combination of working with course material in their own time and having discussion sessions, workshops and practical exercises on campus. Specifically, they emphasise the advantages of being able to watch the video lectures several times.

Conclusion:

Formal flexible education in optometry has a great potential for professional development and bridging the different levels of optometry in Europe and worldwide.

Investigating the Role of Visual-Attentional Abilities in Driver Safety

Jesse Michaels[1], Romain Chaumillon[1], David Nguyen-Tri[1], Donald Watanabe[1]
Pierro Hirsch[2], Francois Bellavance[3], Guillaume Giraudet[4]
Delphine Bernardin[5], Jocelyn Faubert[1]

[1]Visual Psychophysics and Perception Laboratory, School of Optometry, Université de Montréal
[2]Virage Simulation
[3]Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT) and Department of Management Sciences, HEC Montréal
[4]Essilor International, R&D
[5]Essilor Canada Ltd.

Abstract:

Purpose:

When accounting for relative miles driven, drivers 70 years and older are at significantly increased risk of accidents and traffic violations relative to younger adults. The literature on aging and driving suggests that visual sensory measures alone are poor at identifying at-risk older drivers, despite their ubiquity as the sole visual tests for driving re-licensure. Results from numerous studies suggest that higher-order perceptual-cognitive, i.e. visual-attentional abilities ought to be considered as part of broader visual screening and perhaps eventually rehabilitation strategies for aging drivers.

Methods:

115 drivers between the ages of 18 and 86 performed three simulator scenarios meant to represent ecological driving environments with increasing visual attentional loads: highway (low), rural (middle) and city (high). We used an independent task known as 3D-MOT to assess participants' visual-attentional ability. We then investigated whether 3D-MOT ability was correlated with and predictive of measures of driving performance.

Results:

3D-MOT was strongly correlated with the number of crashes ($r(113) = -.31$, $p < .001$), standard deviation of lane position ('SDLP' ($r(113) = -.26$, $p < .005$), distance at max steer change rate ($r(113) = -.2$ $p = .03$) and naturally adopted mean speed ($r(113)=.54$, $p < .001$). These results show that the more the perceptual-cognitive abilities were altered, the more driving speed decreased and crash occurrence increased. Linear regression analyses demonstrated that 3D-MOT predicted crashes ($\beta = -.36$; $t = -2.75$; $p = .007$), naturally adopted mean speed ($\beta = .37$; $t = 3.18$; $p = .002$) and had a tendency to predict max brake ($\beta = .23$; $t = 1.75$; $p = .08$). By comparison, age only predicted the maximum amount of braking ($\beta = .34$; $t = 2.61$; $p = .01$).

Conclusion:

Our results suggest that visual-attentional measures could identify subtle changes in perceptual-cognitive ability affecting driving ability. Alongside visual sensory measures, such measures could help determine aging patients' continued fitness to drive. Previous research demonstrating the trainability and transfer of 3D-MOT ability suggests that rehabilitation may even be possible in cases where drivers are deemed at-risk.

Do we Really Understand where the Information in a Human Eye of a Photon Ends, and the Information of an Electron Begins?

Ettore Tamajo

University of Applied Sciences Velika Gorica, Croatia

Abstract:

This question is even nowadays very fundamental despite the progress of science and computers. The photon as a quantum of electromagnetic radiation is behave quantum mechanically, and hence we are forced to treat so as well its roll and nature.

The photon has not its mass of rest, its velocity is always at speed of light. The photon is a mediator of the electromagnetic force, hence it is called a bozon. The impact of such an entity in the human eye retina assumes that information transforms and continues to travel in form of an electron through the human brain.

An electron of course has its mass of rest, hence it travels with a speed much less than the speed of light. The electron is an elementary particle and hence it is a fermion. Even today we don't know where exactly this information transformation in the human eye happens. This presentation is going to try explain such a transformation, and where is happening.

Visual Acuity Revisited

Matjaž Mihelčič[1]

Duško Opsenica

[1]University of Applied Sciences Velika Gorica

Abstract:

Purpose:

The results of visual acuity (VA) measurement normally include not only the minimum separabile as a resolution threshold, but also a factor of recognition of the object – the minimum cognobile. We aimed to separately assess these two factors by designing an optotype, which obeys the Snellen E construction (5 x 5 squares), but does not represent any known sign or optotype.

Methods:

Visual acuity of 26 Subjects in the age group 19 to 25 years (AVE 22,3 years) and 26 subjects in the age group 26 to 46 years (AVE 33,1 years) was tested by means of a) Snellen E optotype and b) unconventional optotype, designed in the same rule as Snellen E. Each optotype was printed on a card in the VA resolution of 1,0 (6 / 6) for 6 meters, but was first presented at 12 meters. The threshold was determined by spatial approaching of the examiner. Subjects had to copy the optotype when they "recognized" it.

Results:

Both age groups showed significant drop in measured VA when using unconventional optotype. In the younger group, the average drop of was 7,3 % ($p < 0,001$) and in the elder group, the drop was 19,5 % ($p < 0,001$).

Conclusion:

The effect of minimum cognobile is a potent factor in determining the visual acuity; according to our study´s findings, more so in the elder population. We can hypothesize that effect is due to stronger established patterns for known objects in more experienced readers. These facts suggest that VA, measured with conventional optotypes through lifetime, may give unrealistic curve of VA changes. The real decline of VA in aging could be steeper than previously assumed.

In the presentation, several neurological and psychological aspects, i.e. neural adaptation to fogging and form recognition effect will be discussed.

PULA2018

Optometry and Optics for Better Vision

11-13 May CROATIA

Young Researchers Abstracts

New techniques for the screening and refraction of presbyopic vision impaired people

Adele Longo

Essilor International

Abstract:

The management of presbyopic and non presbyopic patients requires a specific attention. In depth vision health screening is mandatory, refraction has to be carefully conducted for both distance and near and dispensing should be managed accurately.

This presentation will review the different steps of a today's patient journey. A specific focus will be made on the latest techniques that practitioners can use for successfully managing their presbyopic patients, from screening to refraction to dispensing.

Comparison of Two Methods for Prescribing Prism and Correlation With Symptoms

Ondrej Policar[1]

Kristijan Pili[2]

[1]Czech Technical University

[2]University of Applied Sciences Velika Gorica

Abstract:

Purpose:

In the optometry practice there are large amount of methods and tests, according which we can prescribe prism correction. But which prism correction is the best one? The most important factors in assessing the success of prismatic correction are subjective feelings of the patient. If the patient was satisfied and symptoms of decompensated heterophoria resolved, we can say that prismatic correction is successful. In this study, correction according to Maddox rules (Maddox rod method) and Mallet fixation disparity test was compared based on the subjective feeling of the patient and connection with the symptoms. With Maddox rod dissociated heterophoria is measured whereas with Mallet test associated heterophoria is measured. In previous studies was shown, that associated heterophoria is better indicator of symptoms of decompensated heterophoria but in the Czech Republic and other European countries both methods are still used for prescribing the prism correction.

Methods:

Symptoms of decompensated heterophoria were quantified according to a created questionnaire that evaluates a magnitude of observed symptoms. Both methods were used during examination and resulting prisms were presented to the patient. Patient consequently rates both possibilities on the scale from 1 to 10. Results of both methods were correlated with every single symptom and with total score resulting from the questionnaire.

Results:

It was found a significant statistical difference ($p < 0.05$) between compared methods. Prisms measured with Mallet test were more comfortable for most respondents. Moreover, correlations with symptoms was higher for associated heterophoria measurement. The highest correlation coefficient was found between symptoms of occasional diplopia and the results of Mallet method.

Conclusion:

This study confirms some results of previous studies. Associated heterophoria measurement is much better indicator of symptoms and the correction of associated heterophoria is more comfortable than the usage of Maddox rules. This study also gives us information about specificity of decompensated heterophoria symptoms.

Spontaneous Visual Acuity in Students who Have Entered Higher Education for the First Time

Erna Vukalić

Abstract:

Purpose:

The purpose of this study was to evaluate visual acuity in university students.

Methods:

Visual acuity was measured with a high-contrast EDTRS logarithmic acuity chart in a random sample of 855 students who enrolled at the University of Minho (Portugal) in 2017. Subjects with a previous history of surgery, existing pathology and older than 25 years of age were excluded from the study to reinforce homogeneity and representativeness of the sample. The study protocol was compliant with the Declaration of Helsinki and was approved by the Ethics Subcommittee for Life and Health Sciences. Statistical analysis was conducted using SPSS v24 (IBM,IL) to calculate descriptive statistics for the data set and obtain comparison between groups.

Results:

The average age of 835 study participants was 19±1 years (the sample including 63% females; 37% males) and they had their last visual exam 2.2±2.3 years ago (range given: 0 to 13 years). LogMAR visual acuity was 0.00 (decimal 1.0 or 10/10) or higher in 17% of the sample, between 0.00 and 0.3 (decimal 0.5 or 10/20) in 64% and lower than 0.3 in 19% of the sample. Inter-ocular VA values were found to be highly correlated (Pearson $r=0.775$, $p<0.001$), the mean visual acuity was 0.17±0.2 in the right eye and 0.16±0.2 in the left eye and this difference was statistically significant (paired sample T-test; $p=0.016$). The mean inter-ocular difference regarding visual acuity was 0.011±0.14 (95% confidence interval for the difference ranging from 0.002 to 0.021). Visual acuity was determined to be significantly better in contact lens wearers (14% of the sample) than in the remaining group (independent sample T-test, $p<0.001$), which is related to the fact that a significant number of spectacle wearers usually do not wear their prescription glasses.

Conclusion:

Nearly half of study participants have prescription eyeglasses but a significant number of them do not use them regularly. As a result, their visual acuity is poor and this might adversely impact their learning activities. It is necessary to develop strategies to stimulate the use of prescription eyeglasses among the students before they enroll into the university and during their university years.

The effect of mydriasis on intraocular pressure and anterior chamber angle in narrow angles (grades 0-2)

Elena Iuliana Linde Coztiny[1]

Ellen Svarverud[1]

[1]The College of South-East Norway Faculty for Health and Social Science

Abstract:

Purpose:

With the introduction of diagnostic drugs as part of optometric practice, there have been some concerns that patients with narrow anterior chamber angles are at risk of developing angle closure. This study evaluates if mydriatics changed the intraocular pressure and the measured anterior chamber angles in healthy people graded with narrow anterior chamber angles using van Herick's method.

Method:

The study included 29 patients (58 eyes) between 18 and 76 years (72.4% females), all of which had anterior chamber angle graded 0-2 using van Herick's method. The examination procedure included measurement of intraocular pressure using Icare tonometry and anterior chamber angle grading using van Herick's method and gonioscopy (six-mirror lens under local anaestetics). After being enrolled in the study, the patients were examined on two different occasions; 1) without mydriatics and 2) pupils dilated with Tropicamide 0.5%. Intraocular pressure was always performed before angle grading.

Results:

There was no significant change ($p=0.899$) between intraocular pressure measured before and after using mydriatics. Generally, the anterior chamber angle was graded significantly narrower in nasal and temporal quadrants using van Herick's method compared with gonioscopy, both before and after dilating ($p< 0.001$). Grading with van Herick's method showed statistically significant narrower angles under mydriasis ($p< 0.001$). Gonioscopic grading showed statistically significant narrower angles under mydriasis for nasal ($p=0.046$), superior ($p=0.046$) and temporal ($p=0.014$) quadrants. The narrowing of the angle was never more than one grade difference before and after using mydriatics, and in no cases was the angle grade 0. There were no incidents of angle closure.

Conclusion:

There was no significant change in intraocular pressure using mydriatics in this study, but chamber angles were graded statistically significant narrower with both techniques. However, the clinically significant change is modest, and the benefits of a good view of the posterior segment outweighs the minuscule risk of developing angle closure.

Oral presentation abstracts

Near correction and ocular health care service enhance visual function in life-long male prisoners in Moldova

Cathrine Saastad[1]

Ellen Svarverud[1]

Irene Langeggen[1]

Jan Richard Bruenech[1]

[1]University of South East Norway

Abstract:

Purpose:

Good vision is important for general health and quality of life. However, previous literature has promoted the view that the prevalence of vision problems is higher among incarcerated persons than in normal populations. Prisoners comprise a vulnerable group, with none or restricted rights, and are prohibited from ocular health service in many countries, including Moldova. This study aims to investigate visual status in a group of prisoners in Moldova.

Methods:

Male prisoners (n=40) sentenced to life in Rezina prison participated in the study. Due to security reasons, strict rules and time efficiency, a screening protocol was used. The screening consisted of brief history taking, habitual visual acuity (VA) distance and near, cover test distance and near, near point of convergence (NPC), monocular accommodation amplitude and ocular motility. A short questionnaire including how many years they attended school and self-reported reading and writing skills was performed. Non-cycloplegic retinoscopy was performed by an experienced optometrist. Referral for a comprehensive eye examination was not possible, but glasses were provided when necessary.

Results:

Mean age was 40.9±8.0 years (range 19-62). Binocular habitual decimal VA was 0.8 or poorer in 13 (32.5%) participants at distance and in 25 (62.5%) at near. 13 (32.5%) showed NPC poorer than 10 cm. 15% had myopia (SER ≤ -0.5 DS), 67.5% emmetropia (-0.50 < SER < +1.00 DS) and 15% hyperopia (SER > 1.0 DS). 17.5% had astigmatism (≤ -0.75 DC) and 15% anisometropia (≥ 1.00 DS). 33 (88%) participants completed the questionnaire. Of those, 3 (9%) and 1 (3%) reported poor reading or writing skills, respectively. On average they attended school for 10.8 ±3.1 years (range 5-19). Only 2 of the prisoners discontinued during the primary school. Reading glasses of at least +1.50 DS were provided to 50% of the prisoners.

Conclusion:

Our results show the importance of vision examinations for prisoners in Moldova. Ocular health care services are of great value for these people regarding their daily life, function and rehabilitation. The ability to do close-up work makes the prisoner able to read books, participate in education or work in handcraft workshops within the prison.

Investigation on the handling and disposal of contact lenses

Dorotea Prguda[1]

Sanja Kalambura[1]

[1]University of Applied Sciences Velika Gorica, Croatia

Abstract:

Purpose: The aim of this research was to investigate how students handle contact lenses (CLs) in everyday life and are they aware about environmental problems which can be caused by them.

Methods:

Several scientific methods were used: inductive and deductive, analysis and synthesis, statistical and methods of interviewing.

Results This research consisted of 467 directly involved students from 4 different study programs. 21% or 100 students use contact lenses in daily life. 52% are female and 48% male; 72% are in age range between 20 and 25 years. 69% of them are myopic. 30% of students wear contact lenses longer than the prescribed time and 54% regularly wear spectacles as well as CLs. 43% wear monthly CLs and 39% daily CLs. 61% do not have any health problems with CLs but 39% have typical irritation reactions: foreign body feeling and symptoms of dryness. 76% of students wash their hands before handling CLs, 88% of them always keep the CLs in their own package and 85% always use prescribed solutions. The monthly CL wearer uses 12 pairs of contact lenses, including packaging, and 12 plastic bottles with cleaning and storage solution, which results in 549 grams of polymer waste per year. That will be for Croatia 57 tons of polymer waste per year.

Conclusions:

Optometrists are very important in educating clients. Also in the terms of global waste problems, CL wearers should be made aware of the waste produced daily . Estimated quantities of polymer waste are not very large in amount in terms of total waste, but these quantities are not negligible. For successful recycling, the first step is proper separate collection and our proposal is to prepare a good pilot program in every EU country level to show that optometrists also care for the environment.

Visual Changes Induced by Transcranial Magnetic Stimulation

Ana Rita Tuna[1]

Nuno Pinto[3]

Amelia Nunes[1]

Maria Vaz Pato[2]

[1]University of Beira Interior

[2]CICS - Health Sciences Research Centre, Faculty of Health Sciences, University of Beira Interior

[3]Dr. Lopes Dias School of Health - Polytechnic Institute of Castelo Branco, Portugal

Abstract:

Purpose:

Recent scientific breakthroughs showed that adult brain has enough neuronal plasticity to permit changes in binocular vision. Parameters such as suppressive imbalance and ocular dominance are fundamental to evaluate the quality of binocular vision.

Through Transcranial Magnetic Stimulation (TMS) it is possible to change cortical excitability of the visual cortex, and influence binocular balance.

The main goals of our study were to quantify the suppressive imbalance before and after applying transcranial magnetic stimulation, and to raise awareness about new techniques that allow balance recovery between the eyes.

Methods:

A group of 4 young adults with ages between 20 to 24 years with a difference of one line of visual acuity and a clear different dominance between his eyes (in average 0,3 neutral density filters), were submitted to a session of continuous theta burst stimulation (cTBS) and were evaluated before and after it. We used as control parameters visual acuity and suppressive imbalance.

Results:

Improvements were observed in sensory ocular dominance of the non-dominant eye in all patients that were evaluated and visual acuity in three of the four patients had improved.

Sensory ocular dominance was quantified for each of the volunteers before and after cTBS and the results were compared, revealing that after cTBS the two eyes where balanced in all subjects. At the beginning the average of suppressive imbalance was 0,066 (± 0,036) and after cTBS was 0,018 (± 0,036). The average of gain proportion was 0,41 (± 0,42).

Conclusion:

After applying cTBS the parameter with more significant enhancements was ocular dominance. It's clear that with only one session of cTBS it is possible to balance the eyes that are asymmetric. We conclude that cTBS is a technique able to make changes in the visual system, possibly by increasing neuronal plasticity.

Inclusion of an extended optometric exam in a traditional optician's shop

Kerstin Eller[1]

Astrid Schulz[1]

[1]Beuth University of Applied Sciences Berlin, Germany

Abstract:

Purpose:

The ocular health is traditionally assessed by ophthalmologists in Germany, and the costs for the exam are frequently covered by health insurance. This may explain why the optometric exam beyond subjective refraction is not very wide spread, and most traditional optician's shops don't even it. However, demographic data suggest that optometric services will be much more in demand in the future. The purpose of this study is to find out whether optometric services are sustainable in traditional German optician's shops.

Methods:

A survey was carried out in 47 in traditional optician's shops, and questionnaires were handed out to 84 community members of which 40 were patients at a clinical optometry class at the university. Based on actual market prices for common optometric devices, average test duration, fee for a qualified optometrist and common customer frequencies a rate was calculated which makes optometric services profitable for small and mid-sizes individual optician's shops in Germany. The study is complemented by interviews with a representative of the local optician's guild and optometrists, who regularly perform optometric eye exams.

Results:

93% of the participants are interested in an extended eye exam of which 85% are willing to pay for it. In mean a fee of 50€ per exam were acceptable. The calculated rate for optometric services indicates that optometric services will only be profitable through cross-financing, e.g. by selling glasses. Of the 47 participating optician's shops only 5 provide optometric services, and only 18 are interested in offering optometric services in the future. These results are in contrast to the opinion of the practising optometrists in this study and of the representative of the (local) professional body who both emphasize the importance of optometric services in the future.

Conclusion:

The results of this study suggest that there is an acceptance and a demand of optometric services among the public in Germany. However, to transform an optician's shop to an optometric practice the corresponding services might need to be well advertised, and public might need to be properly educated about their benefit.

The Berlin Ortho-K-Study – Results with Bifocal Orhokeratology Contact lenses

Ricarda Schmidt

Claudia Herbers

Prof. Dr. Peter Moest

Abstract:

Purpose:

This study is divided into two parts. Its main aim is to investigate if bifocal orthokeratology contact lenses (Ortho-K CLs), FOK(X) BIFO (CH-Falco) improve the near visual acuity of presbyopic patients.

In addition, the annual supply with new monofocal Ortho-K lenses is carried out on the patients of the long-term study.

Methods:

Bifocal Ortho-K CLs were fitted on seven patients and visual acuity was recorded for distance and near vision. In addition, the amplitude of accommodation was evaluated.

New monofocal Ortho-K CLs were fitted on 23 subjects constituting part of a long-term study. The question considered was how many patients require changes in lens-parameters.

Results:

One of the seven patients dropped out of the bifocal study. Two of the remaining six patients reached the intended reading visual acuity of 0.80. One fitting showed a positive trend with a current reading visual acuity of 0.63. In two cases successful monovision with bifocal Ortho-K lenses developed. One fitting shows no difference to the reading visual acuity with monofocal correction.

All six patients are able to read a text with a visual acuity of 0.63 or 0.80 after wearing the bifocal Ortho-K lenses. Three of the six fittings develop an expected result.

The successful reading visual acuity is not in correspondence with the measured values of the maximum ability of accommodation. The suitability of the measuring method must be checked.

The fitting took place in a period between 5 to 12 weeks.

Five of the monofocal patients required a change of lens-parameters. For 14 patients, no changes were required. Four patients were new participants and were fitted Ortho-K CLs for the first time.

Conclusion:

The bifocal Ortho-K lens offers an attractive new option for presbyopes. Unlike the monofocal Ortho-K lenses, a longer period of time is required for the adaptation period.

Approximately one third of the monofocal patients required new lens-parameters. The refractive error seems to have not changed in most of the cases.

PULA2018

Optometry and Optics for Better Vision

11-13 May CROATIA

Workshop Abstracts

Clinical skills workshop

Demonstration and Practice of Optometric Refraction and Binocular Balance When Testing in Parallel

Jonathan Shapiro[1],

Gidon Shapiro[2]

Abed El-Qadir Watad[3]

[1]Hadassah Academic College, Jerusalem

[2] Shapiro Optometrist Ltd

[3] Roayah Optometry Clinic & Vision Care

Abstract:

The examination of the visual functions of acuity, binocular muscle balance, and cortical integration of the two eyes are traditionally taught and clinically performed in a series of examinations. For example, when a parameter, such as the cylinder correction and axis, has been determined and fixed, the next parameter, the spherical correction, is examined. Since the whole visual system is an integration of many factors, there is an inter-relationship between all the parameters. If a test performed later in the routine affects a parameter formally fixed, the examiner may not be aware of this. If, for example, a prism is introduced, it may affect the spherical and cylinder correction formally consider as being fixed. When testing in series it is difficult to see these changes. By testing in parallel the whole aspect of the visual balance can be seen simultaneously. The workshop will explain and demonstrate testing in parallel and the participants will be able to experience the methodology and practice on each other.

Clinical skills workshop

Enhancing the efficacy and efficiency of binocular measurements

Paolo Tacconella

VisivaMente, visual neuroscience association, Italy

Abstract:

It is possible to enhance the efficacy and efficiency of the optometric measurements modifying the psychophysical characteristics of the targets used and the procedures applied. For all the binocular testing it is crucial to use targets that show the presence of central suppression. The implementation of polarized targets to detect central suppression is highly recommended. It would be helpful to consider two forms of relative accommodation or vergence: tonic and phasic, the first being the standard test of relative function and the second being the "facility" test. Some of the probes used in optometry can be consider as typical performance testing and some other are of maximum performance. Understanding their differences is helpful to assign the right importance to the tests we use on a daily basis.

Clinical skills workshop

Evidence Based Clinical Decision Making in Optometric Car

Melisa Vitek[1]

Janice Scharre[1]

[1] Salus University, United States

Abstract:

While most healthcare providers embrace the belief that evidence-based clinical decision-making leads to better patient outcomes, many, including optometrists, provide healthcare that lags behind the current scientific literature. Optometrists often have difficulty finding, appraising and/or applying current best evidence. Participants in this hands-on workshop will work in small groups. A specific patient scenario will be provided and each group will be asked to formulate and categorize an answerable clinical question. Groups will then search the literature and share with the large group their search experiences. A specific article will then be provided to each group and they will work through the critical appraisal of that article. Critical appraisal results will be shared with the large group for discussion. The small groups will then apply the results of that article to the patient scenario. Finally, the small groups will, once again, share their work with the large group for discussion.

Clinical skills workshop

Modern workflow for dry eye evaluations

Sebastian Marx[1]

Julia Wittekind[1]

[1]JENVIS Research Institute, Jena, Germany

Abstract:

Dry eye is a common eye disease which is characterized by various symptoms. Nowadays not only older people are suffering from dry eye as young people doing extensive work on displays during the days which leads to an increase of dry eyes in that population group as well. Although a multiplicity of dry eye tests are available, not every test can be performed. The workshop will demonstrate a quick dry eye screening which can be conducted before every refraction consisting of three short tests in order to evaluate if a more sophisticated screening needs to be done. Additionally a new time efficient workflow will be introduced using slit lamp and Keratograph 5M to finally identify the cause and develop a treatment plan. The intention of the workshop is that every attendee may conduct the new approach.

Clinical skills workshop

Neuro - optometric examination

Konstantinos Katsoulos

MSc, FBCLA, FEAOO, FAAO

Athens Eye Hospital, Greece

Abstract:

Workshop Content:

Examination of the patient presenting with manifestations of neurological disease. Advanced examination of the pupils, ocular motility and gaze defects. Basic examination of the cranial nerves, and examination of the ptosis patient and the optic neuritis patient. Videos and photos of real patients will be presented and discussed.

Skills To Be Developed:

Use of the penlight for the examination of pupillary reflexes. Ocular motility examination techniques to test for complex strabismus cases and gaze deficits indicative for neuro-ophthalmological pathology. Basic nystagmus evaluation.Techniques for examining the ptosis patient (Palpebral aperture measurement, levator function measurement, Bell's phenomenon evaluation, lid function, exophthalmos evaluation).

Learning Objectives:

The attendant, by the completion of the workshop, should be able to differentiate the various forms of pupil dysfunction (e.g. Horner's syndrome, Adie's tonic pupil, bilateral tonic pupils). He/she should be able to examine the cranial nerves and evaluate patients presenting with ophthalmic manifestations of neurological disease. The participant should also be able on completion to decide on the referral process. The participant should be able to investigate the patient with tests such as lid fatigue, lid twitch sign and ice test, and guide the rest of the investigation, with blood tests or neuroimaging (magnetic resonance imaging, magnetic resonance angiography, computed tomography) and manage or refer appropriately. Referral pathways to ophthalmologists, neurologists and endocrinologists will be discussed. Additionally he should be able to perform the basic examination of the optic neuritis and the Graves' ophthalmopathy patient. Additionally, the role of visual evoked potentials (VEPs) in the investigation of optic neuritis will be discussed.

Clinical skills workshop

New technics for the screening and refraction of presbyopic patients and for the dispensing of progressive lenses

Essilor sponsor workshop

Adele Longo[1]

Davor Mihaljević[2]

[1]Essilor International

[2]Essilor Croatia

Abstract:

The management of presbyopic patients requires a specific attention. In depth vision health screening is mandatory, refraction has to be carefully conducted for both distance and near and dispensing should be managed accurately.

This presentation will review the different steps of a today's patient journey. A specific focus will be made on the latest techniques that practitioners can use for successfully managing their presbyopic patients, from screening to refraction to dispensing.

In the workshop participants will be invited to follow demonstrations as well as to practice. They will be offered a copy of the Essilor Academy "Practical Refraction" Ophthalmic Optics File as well as of the "Progressive Lenses Fitting Guide".

Clinical skills workshop

"Out of the box" Soft lens and RGP - fits onto acclamation – interactive case studies

Gustav Pöltner

Augenoptikermeister, Kontaktlinsenoptiker, Lehrbeauftragter
VDC/O, ECOO
Contactlinsen - Institut – Miller – Innsbruck/Austria
FH-Gesundheit-Tirol - Innsbruck/Austria
HTL-Kolleg-Optometrie, Hall in Tirol/Austria
University of Applied Sciences Velika Gorica / Croatia

Abstract:

What is the best contact lens solution for our client? Disposable soft – or individual soft lenses? RGP-with special fit? Will we find an moovement by soft lenses, if the back surface geometry is absolutly parallel, to the Cornea geometry and the Coreno scleral profile? Which parameter changing will have the higher effect of the fit, the change of the radius or the change of the diameter?

Questions over questions. In this interactive quiz-modul, participants should find a common answer of most of this questions. An exciting trip should be done absolutly - by you.

Clinical skills workshop

Practical skills in direct ophthalmoscopy

Pavel Beneš[1]

Synek Svatopluk [1]

[1]Department of Optometry and Orthoptics, Faculy of Medicine,
Masaryk University, Brno, Czech Republic

Abstract:

After the short introduction to ophthalmoscopy will be discussed basic principles and methods how to recognize different ocular conditions leading to structural changes of retinal tissue. Following that theoretic part the participants will be able to try the direct ophthalmoscopy via direct ophthalmoscopy simulator. Software of this device is able to offer many pathological ocular conditions which are common especially in older age population. For example age related macular degeneration, diabetic retinopathy and others. In this workshop participants will be able to better understand the importance of this kind of eye examination, identify various retinal conditions which can cause to visual acuity loss. They can improve their skills with direct ophthalmoscope handling.

Clinical skills workshop

Screening of visual functions

Andreas Berke[1]

Gustav Pöltner[2]

[1] ZVA Zentralverband der Augenoptiker und Optometristen
[2]Augenoptikermeister, Kontaktlinsenoptiker, Lehrbeauftragter
VDC/O, ECOO
Contactlinsen - Institut – Miller – Innsbruck/Austria
FH-Gesundheit-Tirol - Innsbruck/Austria
HTL-Kolleg-Optometrie, Hall in Tirol/Austria
University of Applied Sciences Velika Gorica/Croatia

Abstract:

Comprehensive optometric examination includes screening of visual functions. Ocular motility, horizontal and vertikal sakkades, binocular function, pupil reaction and visual field are important aspects of vision. Easy to perform tests can reveal a number of crucial visual disorders. We demonstrate screening procedures that are simple, unexpensive and not time consuming.

Clinical skills workshop

Scleral lenses made easy

Langis Michaud

Universite de Montreal, Canada

Abstract:

Purpose:

To demonstrate how to simplify the fitting and the evaluation of scleral contact lenses on irregular and normal corneas.

Methods:

Didactic portion covers the basic principles of scleral lens fitting and evaluation. Emphasis is made on the use of smaller diameter scleral lenses as an easier way to fit and to troubleshoot issues as well as a healthier option for the ocular surface vs other modalities. A practical session follows this brief presentation where attendees will practice insertion and evaluation of scleral lenses among each other. At the end, a brief summary will cover the top 5 troubleshooting issues.

Results:

Attendees will be able to fit, evaluate and troubleshoot the usage of smaller scleral lenses.

Conclusion:

scleral lenses are part of modern optometry and should be used on a regular basis. They provide comfort, stable vision and are a healthy option, if fitted properly.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Clinical skills workshop

The ABC of BV – Vision Training for Busy Optometrists

Chaterine Porter[1]

Nicholas Rumney[2]

[1]University of Manchester, United Kingdom

[2] BBR Optometry

Abstract:

The aim of this two hour interactive workshop is to encourage Optometrists to make appropriate use of the binocular vision tests they already have in practice: cover test, convergence assessment (NPC and jump convergence), accommodation assessment (including flippers), and prism fusion range. It will provide a brief refresher on the infrastructure required for binocular vision and discuss the links between accommodation and convergence. After attending practitioners will be able to demonstrate and interpret the results of various basic binocular vision tests, and know how to use simple vision training exercises (brock string, dot card, 3 cats and hart chart accommodative rock) to treat common disorders of convergence and accommodation. The final part of the workshop will involve a discussion of anonymised patient case records. This will enable practitioners to develop a management plan for their patients which they can immediately implement in their own practice.

Clinical skills workshop

The EUROMCONTACT Loyalty Simulator

Helmer Schweizer

Alcon, Schools of Optometry in Velika Gorica and Novi Sad

Abstract:

Every business owner faces a lot of challenges and has a lot of concerns, when considering changes on how she / he run the business. Those changes can be a) to measure the customer retention and stay closer to the customers by e-mails etc. b) to increase the number of subscrîptions for contact lenses, c) to charge (more) fees for the services around contact lenses and at the same time lower the prices for the products, as well as d) to increase the number of CL wearers. The EUROMCONTACT loyalty simulator tool allows 'playing' with some of these changes, even in some extreme ways, before making a decision. It can then also be used to derive KPIs to track the progress versus set goals. This may give the individual more confidence in selecting the area of change, the magnitude and the goals of the envisioned change(s). This presentation will show how the tool works, hand out the link to the web based tool and encourage the attendees to actively use the tool. The workshop will discuss with the participants the reasons for considering change. It will deliver ideas on the how of the change, including the need for communication.

Clinical skills workshop

Vision and sesnorimotor skills trainig

Damjan Žunić[1,2,3]

Antonio Mikulić[3,4]

[1] Eye clinic dr Vukas, Zagreb, Croatia
[2] University of Applied Sciences Velika Gorica, Velika Gorica, Croatia
[3]Eye clinic Optical Express, Zagreb, Croatia
[4]Biotrening center, Zagreb, Croatia

Abstract:

The main purpose of this workshop is to introduce optometrist with exercises that can help professional athletes and patients undergoing physical therapy improve their sensorimotor skills. By implementing those exercises professional athletes can improve their performance and patients undergoing physical therapy can speed up their recovery and get back to everyday life.

Participants will be shown how optometrist can analyze, train and improve skills such as perception span, dynamic vision, multiple object tracking, eye hand coordination and other skills. They will also be shown how to analyze gathered information and how to create an improvement plan. We will be using the most advanced equipment available in combination with balance boards, tennis balls, Brock-String, Marsden ball and other. Participants will have the opportunity to use all of the mentioned equipment to test some of their own sensorimotor skills and see in which areas they have the most potential for improvement.

Clinical skills workshop

Visual Stress in practice

John Mc Gann[1]

Rupal Lovell-Patel[2]

[1] Dublin Institute of Technology, Republic of Ireland

[2] Anglia Ruskin University , United Kingdom

Abstract:

A proportion of patients encountered by optometrists and dispensing opticians in practice will report visual perceptual distortions (pattern glare) when viewing striped patterns. This may result in symptoms of "visual stress" in these individuals many of whom will also display reduced reading speeds.

We know too that undetected vision problems such as vergence and accommodative anomalies are common and individuals affected may present with symptoms similar to those with visual stress. It is therefore important to correctly identify those whose reading speed might be improved through the use of coloured overlays or specific lens tints.

This workshop aims to demonstrate how to investigate and manage individuals presenting with visual stress using Cerium Optical Intuitive Colorimeter, Wilkins Rate of Reading Test and Institute of Optometry Pattern Glare test.

PULA2018

Optometry and Optics for Better Vision

11-13 May CROATIA

Poster Session Abstracts

105

Digital Eye Strain in Group of Young Subjects

Pavel Beneš[1]

Petr Vesely[1]

[1]Department of Optometry and Orthoptics,

Faculty of Medicine, Masaryk University, Brno, Czech Republic

Abstract:

Digital Eye Strain is a very actual topic today. Almost everyone spends most of his/her daily activities working at near. A large amount of population does not use the proper correction or an optical aid at the distance or does not use the aid at all. If an individual\'s visual apparatus does not work properly, a faster and more severe fatigue occurs when working at near. Also, regeneration is significantly prolonged. The aim of this study is to first demonstrate and diagnose disorders of simple binocular vision in a group of young individuals, but also to evaluate the effect of near working and disorders of simple binocular vision on individual´s fatigue.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

The Effect of Change in Value and the Axis of Astigmatism on Visual Performance at The Different Visual Distances

Petr Veselý[1]

Barbora Langova[1]

[1]Department of Optometry and Orthoptics,
Faculty of Medicine, Masaryk University, Brno, Czech Republic

Abstract:

Purpose:

The aim of this study is to verify whether exist a difference in adaptation to spectacle lenses with spherical and aspheric design and whether patients perceives the difference in vision quality during the comparing these two types of lenses and determining what type of lenses will be preferred.

Methods:

For this study were selected 18 patients with a refractive error greater than -3 D. In the study, we had 67 % of women, 33 % of men with the average age 26. The patients used both pairs of spectacle lenses for comparing visual comfort, image distortion and chromatic aberrations. We measured visual acuity (central and peripheral angle 30°) without adaptation and after adaptation. We measured subjectively astigmatism of oblique rays for viewing angle 30° without adaptation and after adaptation, further image distortion without adaptation and after adaptation.

Results:

The central, respectively peripheral visual acuity with aspheric designed spectacle lenses was improved from 0.89, respectively 0.82, to 1.0, respectively 0.99 in decimal expression.

The central, respectively peripheral visual acuity with spherical designed spectacle lenses was improved from 0.98, respectively 0.97, to 1.0, respectively 0.99 in decimal expression.

Parametrical paired T-test showed statistical important difference only in case of aspheric designed lenses ($p = 0.002$ and $p = 0.0003$).

Peripheral image distortion in aspheric designed lenses was 1.92 % before adaptation and 1.05 % after two weeks adaptation.

Peripheral image distortion in spherical designed lenses was 1.47 % before adaptation and 1.67 % after two weeks adaptation.

We found statistically significant difference only for aspheric lenses ($p = 0.001$).

Conclusion:

In this study, patients were able to compare two types of spectacle lenses. Results of measured visual acuity and image distortion clearly indicate that aspheric lenses need some adaptation for improving visual performance over spherical surfaces.

Finally, both lenses enable the same quality of visual acuity for both central and peripheral gaze after 14-day adaptation of subjects. From the measured results, we can conclude that the visual acuity was not impaired by the residual refractive defect, but due to the distortion of the image with aspheric lenses.

Color Vision In Group Of Subjects Without And With Chromagen Filter

Petr Veselý[1]

Lucie Patočkova[1]

Pavel Beneš[1]

[1]Department of Optometry and Orthoptics,

Faculty of Medicine, Masaryk University, Brno, Czech Republic

Abstract:

Purpose:

Our aim in this study was to prove influence of chromagen filter on color vision quality. Further, we wanted to compare quality of color vision in groups of young healthy persons with persons with maculopathy.

Methods:

We had in total 39 subjects in our study. First group contained 13 subjects with average age 23 years without important eye pathology. In the second group we had 13 patients (average age 68 years) with maculopathy. Third group contained subjects with average age 64 years without important eye pathology. While examination we used sorting tests for color vision: Farnsworth-Munsell test and Lanthony test. We evaluated results according the Vingryse and King-Smith quantitative technique, where TES around 100 means slight defect of color vision.

For statistical analysis we used parametric T-test with level of statistical significance set on 0.05.

Results:

We found that average total error score (GTES = 107.46) in young healthy subjects with color chromagen filter does not differ from TES value gained from patients with disease of macula (MTES = 105.27, p = 0.86). Further we found that chromagen filter changes color vision in group of young subjects on statistical significant level (TES = 82.15, GTES = 107.46, p = 0.01). However, in clinical view this is not important color vision defect (TES = 107.46 and CI = 1.42). Next study result showed statistically not important difference between the color vision in young healthy patient (average age 23 years) and older healthy patients with average age 64 years (TES = 82.15, STES = 79.53, p = 0.58).

Conclusion:

Finally, we can conclude that green color chromagen filter does not have negative influence for dyslectic patients who will use this chromagen filter all day, because of GTES value 107.46. This value is very small and does not not negatively influence practical color vision. Further, we proved that color vision deterioration of patients with macular disease is not important for practical distinguishing of colors but is important clinically for diagnostic purposes. Finally, we brought result, which shows not important difference between young healthy subjects and older subjects (23 versus 68 years).

Correlation of the Keratometry Values from Pentacam, Iolmaster and Verion

Jan Vaverka[1], Aneta Čunderlova[1], Šarka Skorkovska[1], Jana Zuczkova[1],

[1]NeoVize

Abstract:

Purpose:

To achieve the best results of intraocular refractive and cataract surgery are essential exact data of the anterior segment biometric measurements. The aim of this study was to evaluate correlation of keratometry, axis and power of astigmatism prior the operation in comparison of three different device.

Methods:

In our retrospective study of 50 eyes was keratometry acquired by Pentacam (Oculus Gmbh, Wetzlar, Germany), IOLMaster (Carl Zeiss Meditec, Jena, Germany) Verion (Alcon, Fort Worth, USA). Each device performs on a different physical principle, the calculation takes into account different corneal area and refractive index. Excluded were patients with systemic disease, after any corneal surgery, with corneal diseases and eye injury. Isoosmolar artificial tears were used prior each measurement to exclude the error due to the dry eye.

Results:

Differences between measured data form IOLMaster and Verion are not statistically significant. Pentacam keratometry data in compassion with data obtained by IOLMaster (resp. Verion) are not statistically significant (the difference is statistically significant; $p < 0{,}001$). Differences between measured astigmatism and axis are not statistically significant.

Keratometry values, axis and power of astigmatism obtained by used devices achieved high correlation ($r = 0{,}98$).

Conclusion:

Even we have found high correlation within all devices, to exclude the error or inaccurate postoperative refractive outcome it is worth to compare the results on more devices based on surgeon´s or technician´s experience.

Levels of Cortical Integration of Binocular Vision by the Use of Varying Parameters in a Random Dot Stereogram.

Jonathan Shapiro

Hadassah Academic College

Abstract:

In clinical optometry a good level of stereopsis is often taken as an indication of good binocular vision. This presentation challenges that assumption by showing that the image received at the visual cortex by one eye can be grossly distorted while stereopsis can be maintained.

A high level of integration of the monocular images, formed at each retina, in the visual cortex is the ultimate goal of providing vision care. It is assumed that there are no phorias or fixation disparity causing de-compensation of the binocular stability.

Binocular vision can be considered as being composed of two different components. These are (1) the simultaneous perception of the image from each eye in two dimensions, and (2) the stereopsis caused by retinal disparity. These two types of perception are not identical and are measured with different systems.

The level and stability of the binocular cortical integration can be measured by altering the parameters of the input from one eye until suppression occurs.

In this presentation the subject is presented with a two-dimensional Red/Blue anaglyph. The level of the luminance of one of the targets is reduced until suppression occurs. (Pulfrich suppression). In the second part of the presentation a Random Dot Stereogram is presented with changes in a) levels of luminance; b) aniseikonia - total/horizontal/vertical, and rotational.

The subject viewing the target will determine when suppression occurs.

A comparison can be made between the point of suppression of a two-dimensional target and a stereo target that occur by changes in the luminance.

Aniseikonic changes on a stereoscopic image, that still allow the creation of a stereo image, can be measured. The point of suppression is often at variance with that stated in text books.

Comparison of Intra-Ocular Pressure With Different Tonometers in Normal Subjects

Abbasali Yekta[1], Hamed Momeni-Moghaddam[2], Mohammad Reza Sedaghat[4]
Mobina Ghanavati[1], Nasim Maddah[1], Hadi Ostadimoghaddam[2]
Mehdi Khabazkhoob[3], Javad Heravian[2], Abbas Azimi Khorasani[2]

[1]Department of Optometry, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Refractive Errors Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
[3]Noor Research Center for Ophthalmic Epidemiology, Noor Eye Hospital, Tehran, Iran
[4]Department of Ophthalmology, Khatam-anbia Hospital, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract:

Purpose:

To compare the intra-ocular pressure (IOP) measured by different tonometers and compare it with the Goldman tonometer as a gold standard. The effect of cornea biomechanics on the results of different tonometers was investigated and compared with the compensated pressure based on the biomechanics presented by Corvis.

Methods:

In a cross-sectional study, data were collected from 94 eyes of the normal people who were candidates for refractive surgery. Intra-ocular pressure was measured by automatic Goldman, non-contact Topcon, ocular response analyzer (IOPg and IOPcc), Corvis device (IOPncc and bIOP), Icare and manual ART. Corneal biomechanical parameters were evaluated using Schimpflag technology by Corvis device and ocular response analyzer, and corneal thickness measured by Pentacam. Data were analyzed using SPSS 22 software using ANOVA, Pearson correlation and independent t-test. Blund and Altman charts and the intraclass correlation coefficient (ICC) used In order to determine the IOP measured by different tonometers agreement with Goldman tonometer, and IOP by different tonometers agreement with bIOP(measured by non-contact Corvis tonometer).

Results:

The results of this study showed that the highest and the lowest IOP were obtained from Topcon non-contact tonometer (17.30 ± 2.5 mmHg) Goldman tonometer (13.08 ± 2.66 mm Hg) respectively. Significant differences was found between IOP measured with the Goldman tonometer and the other, but the least mean difference and highest agreement with the pressure measured with the Goldman tonometer in the Icare tonometer (within the range of ± 4.93) were found. The agreement of the results between different pressures with bIOP showed a relative agreement between Goldman and bIOP results and a fairly complete and strong agreement between IOPncc and IOPcc with bIOP, respectively. Significant differences in IOP measured in thin and thick corneas with non-contact Topcon, Icare, ART, IOPncc and IOPg in ORA were found ($P< 0.05$). Measured IOP with Goldman, bIOP and IOPcc did not show significant differences in corneas of different thicknesses.

Conclusion:

Icare tonometer can be a good alternative device for measuring IOP, especially in glaucoma screening programs without using anesthetics.

Evaluating Corneal Densitometry in Keratoconic Patients Versus Normal Control Subjects

Amit N. Jinabhai[1], Ali S Alrashah[1], Khaled Alzahrani[1], Chantal Hillarby[1]

[1]Division of Pharmacy and Optometry, School of Health Sciences,
Faculty of Biology Medicine and Health,
The University of Manchester, Manchester, United Kingdom

Abstract:

Purpose:

To evaluate differences in best-corrected HCVA, corneal densitometry (CD), pachymetry and keratometry measurements between ten normals (27.3±6.7years), fourteen keratoconic patients (24.8±5.8years) who previously (3/12 earlier) underwent corneal collagen-crosslinking (CCXL), and ten keratoconic patients without CCXL (26.5±7.3years).

Methods:

Pachymetry, CD and keratometry measurements were made with the Pentacam. CD data were obtained across three annular zones (6-10mm, 2-6mm and 0-2mm) within the anterior (120µm depth), central and posterior (60µm depth) layers, respectively. Pachymetry data were evaluated at the thinnest corneal location. Keratometry measurements were recorded in the steepest/flattest meridians. HCVA measurements were made using an ETDRS logMAR chart positioned at 4m using either trial lenses (normals), or the keratoconic patient's habitual correction (either spectacles or RGP lenses).

Study parameters were compared between groups using either ANOVA (parametric data), or the Kruskal-Wallis H-test (non-parametric data). Correlation analyses were performed using either Pearson's correlation (parametric data) or Spearman's correlation (non-parametric data).

Results:

Neither age ($p = 0.630$) nor gender ($p = 0.820$) were significantly different between the three study groups. In contrast, ETDRS logMAR HCVA ($p<0.001$), the thinnest corneal location ($p<0.001$), the steepest keratometry readings ($p<0.001$), and the flattest keratometry readings ($p<0.001$) were all found to be significantly different between the three study groups.

With respect to CD, the data in the anterior ($p<0.001$), central ($p<0.006$) and posterior layers ($p<0.006$) were found to be significantly different, across each of the three annular zones, between all three study groups.

However, for all three study groups, no significant correlations were found between the CD values and the HCVA data ($p\geq0.111$); or between the CD values and the flat keratometry data ($p\geq0.077$), or between the CD values and the steep keratometry data ($p\geq0.140$).

For the CCXL group only, there were significant positive correlations between the thinnest corneal location and the CD data in the anterior corneal layer within the 2-6mm zone ($R=+0.537$, $p=0.048$), and within the 6-10mm zone ($r=+0.620$, $p=0.018$). ➞

Conclusion:

Although CD values were found to be significantly different between these three study groups, the CD data could not be used to predict best-corrected HCVA or keratometry measurements in any of these groups.

Accommodative Insufficiency in a University Student Population in Iran

Abbasali Yekta[1], Mehdi Khabazkhoob[3], Fatemeh Azad Shahraki[2]
Hadi Ostdi Moghaddam[1], Hassan Hashemi[3], Mostafa Ahmadi[4]
Javad Heravian[2], Hamed Momeni-Moghaddam[2]

[1]Refractive Errors Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
[2]Department of Optometry, School of Paramedical Sciences,
Mashhad University of Medical Sciences, Mashhad, Iran
[3]Noor Ophthalmology Research Center, Noor Eye Hospital, Tehran, Iran
[4]Azad University of Shahrekord, Shahrekord, Iran

Abstract:

Purpose:

To determine the prevalence of accommodative insufficiency (AI) and its relation with age, gender, and refractive errors in a university student population in Iran.

Methods:

In a cross-sectional study, 726 students of Shahrekord University in Iran were participated in the study through a multi-stage cluster sampling approach. After applying the exclusion criteria, analyses were performed with data from 713 students. The mean age of the subjects was 21.35 ± 1.87 years (18 to 25 years) and 51.1% of them were female.

All students had optometric tests including measurement of visual acuity, subjective and objective refractions, as well as binocular vision anomalies. Amplitude of accommodation was measured with the Donders' push-up method using the Royal Air Force (RAF) rule. Monocular accommodative facility was measured with ±2.00 diopter flipper lenses. The accommodative response was tested using dynamic retinoscopy with the monocular estimation method (MEM). Finally, all students underwent ocular examination by slit-lamp biomicroscopy.

Results:

The prevalence of AI in university students was 4.1% (2.61-5.52). The rate was 6.04% (3.58-8.5) in females and 2.01% (0.53-3.48) in males, and logistic regression showed a significantly higher odds of AI in females (p=0.009). The prevalence of AI was 7.41% in the 18-19-year-old age group and 5.88% in the 24-25-year-old group (p=0.662). The prevalence of AI among emmetropic, myopic, and hyperopic individuals was 3.74% (1.88-5.61), 4.44% (2.07-6.81), and 5.26% (1.14-11.15), respectively (P=0.869).

Conclusion:

The prevalence of AI in university students was lower than the most prevalence rates reported in previous studies. In the present study, gender and AI showed a strong association, such that AI prevalence was significantly higher in females than males. Accommodative insufficiency had no statistically significant relationship with age or refractive error in university students.

Optimising Testing Strategies when Conducting Maia Microperimetry

Jasleen Jolly[1]

Ruofan Han[1]

Robert Mac Laren[1]

[1]University of Oxford, Oxford, UK

Abstract:

Clinical Topic:

Microperimetry is increasingly utilised as a valuable test for monitoring central retinal function. It differs from other forms of visual field testing by including active eye tracking based on SLO imaging, allowing corrections for some eye movement. Microperimetry fields are also increasingly used as outcome measures in significant interventional trials. In view of this, the testing protocol for microperimetry must be standardised to allow comparable results to be produced between trials and studies.

Action Taken:

Twenty eyes from 20 healthy patients underwent MAIA microperimetry pre- and post- dilation and no impact of dilation was found (P=0.23). This effect was replicated in a cohort with inherited retinal degeneration (P=0.69). In a separate study, we assessed the impact of dark adaptation time in mesopic conditions prior to testing, on microperimetry performance in 40 eyes from 40 healthy patients and found no adaptation was required following exposure to ambient light (P=0.33) but 10 minutes recovery in mesopic conditions improved thresholds measured following exposure to bright lights such as those from a slitlamp or ophthalmic imaging (P=0.0002).

Recommendations:

MAIA microperimetry testing can be undertaken with or without dilation but conditions should remain consistent within clinical trials. No formal dark adaptation is required prior to performing microperimetry. However, a minimum of 10 minutes recovery in mesopic light conditions is advisable in order to ameliorate the impact of exposure to bright lights routinely used in a clinical setting.

Real Time Blink Monitoring: A Realistic Approach

Marc Argiles[1]

Genis Cardona[1]

Elisabet Perez[1]

[1]Polytechnic University Of Catalonia

Abstract:

Purpose:

Users of visual display terminals (VDTs) commonly complain of visual fatigue and dry eye after prolonged work in front of the computer. Computer use has been associated with an alteration of blinking patterns and with a larger palpebral aperture, influenced by cognitive demands and screen position, respectively. The joint contribution of both factors results in a greater exposure of the ocular surface to the environment and in an increased tear film evaporation and instability, leading to dry eye symptoms and visual fatigue. Blinking is commonly monitored with expensive, complex equipment, of difficult implementation in a working environment such as an office or classroom. The aim of the present study was to develop an algorithm for the detection of eye blinks in real time using a simple webcam, which is available in most computer platforms.

Method:

The automatic blink detection process is based on partly modified pre-existing eye detection and image processing algorithms and consists of four stages aimed at eye detection, eye tracking, iris detection and segmentation, and iris height/width ratio assessment. In its current phase of development, it may be used on pre-recorded videos. The algorithm was tested on 17 one-minute video segments of subjects undertaking different tasks on personal computers. A variety of illumination conditions, working distances, face configurations (with and without glasses), skin tone and webcam resolutions were included in the preliminary trials to assess the performance of the algorithm in less than ideal conditions.

Results:

The sensitivity of the algorithm for blink detection was found to be of 87.5% (range 30% to 100%), with a mean false-positive rate of 0.2% (range 0% to 1.7%), depending on the illumination conditions during which the image was captured and other computer–user spatial configurations.

Conclusion:

Given the relevance of exploring blink frequency in the framework of the visual fatigue symptoms experienced by most computer users, non-invasive and non-intrusive blink monitoring strategies are a first step towards developing bio-feedback mechanisms for blink re-education. Further research is being conducted to allow the current version of the algorithm to operate with real-time video streaming and with standard computing languages and tools.

The Effects Of Swaying (Shokeling) On Accommodative Function During Learning And Praying Among Yeshiva Students

Einat Shneor[1], Ravid Doron[1], Shalva Miller[1]

Rachel Silver[1], Rachel Eichler[1]

[1]Hadassah Academic College

Abstract:

Purpose:

Accommodation is the ability of the lens to focus on objects at different distances to obtain a clear retinal image (Lockhart and Shi, 2010). Near work habits in the ultra-orthodox community include long hours of sustained near work, with small text size and increased accommodative effort, accompanied by rocking movement back and forth (Ben Simon et al., 2004). The aim of this study was to compare the effects of swaying on accommodative facility and amplitude of accommodation among yeshiva students.

Methods:

Healthy subjects with a minimum of 6/9 for distance and J1+ for near and normal binocular vision participated in the study. The study was approved by the institutional review board and subjects signed a consent form prior to their participation. Participants were divided into those that sway during learning or praying and those that do not (by use of a questionnaire). Over refraction was performed using retinoscopy and subjective refraction. Cover test, Amplitude of Accommodation (Push Up), and Monocular Accommodative Facility (±2.00 flippers) were then performed. Results were analyzed using correlation and unpaired T tests.

Results:

40 male yeshiva students (21 swaying, 19 control) between the ages of 18-30 years (average age 24.4 ± 3.72) participated in the study. We found that the swaying group and the control group had similar MAF (p=0.47) and Amplitude of Accommodation (p=0.14) results. We found no correlation between accommodative ability and the number of years in yeshiva and hours spent studying/ praying daily. Surprisingly, we found a high percentage of accommodative dysfunctions (38%) in both groups.

Conclusion:

Swaying does not affect accommodative ability. Further research on the prevalence of accommodative dysfunctions among yeshiva students can be conducted in the future.

Unusual Accommodation and Visual Disturbance in 7-Year-Old Kid Using Myopic Control Lenses

Ka Yan Leung

The Hong Kong Polytechnic University

Abstract:

Case presentation:

A 7-year-old Chinese female with rapid myopic progression experienced sudden onset of distance vision blur after had worn a pair of prismatic bifocal for myopic control for few months. Best corrected VA was 6/6-, but the response during subjective refraction was sluggish. Normal accommodative amplitude (15D) but poor accommodative facility (+/-2.00D: 0 cpm) was found. Home vision training exercises were prescribed. The blurry distance vision was resolved in around 1-2 months, however, she reported what she saw by LE were dimmer than RE. Red-cap test was performed, she reported the cap was red when seen by RE but was orange when seen by LE. Pupils reflex were normal, no RAPD; rim of both optic nerve head was distinct. Ishihara and saturated D15 results were normal for each eye.

Actions taken:

She was referred to see neurologist, finally her patient brought her to see an ophthalmologist and was diagnosed normal. Her myopia changed from -0.50D to -2.00D in 10-month but then kept unchanged for at least 7 months since she had worn prismatic bifocal. As the prismatic bifocal retard her myopic progression, she keeps wearing the prismatic bifocal as well as the home training: 1. Near-Dist Hart Chart, 2. Hart Chart with +/- 1.00D flipper. Regular follow up in every 1-2 months was advised for monitor her conditions.

Recommendations:

It was suggested under-correction of myopia reduces accommodative effort. Higher accommodative lag in myope with or without wearing bifocal was reported by several studies, however, there is no study literature about accommodative facility for whose wearing bifocal as myopic control. Base-In prism is prescribed to minimize the disruption of oculomotor equilibrium induced by the positive-lens, the accommodation disturbance was more likely due to the positive-lens rather than prismatic prescription. This case raises the need of evaluating the accommodation functions, including the amplitude and facility, prior to prescribe bifocal in pediatric patients, for monitoring the impact of bifocal on the accommodation. Equally important in this case is to rule out any optic neuropathies while pediatric patient gives possible signs of optic neuritis, while the accommodative disorder may just co-exist coincidentally.

Sensorimotor Training - Future of Optometry

Damjan Žunić

Optical Express, Strojarska cesta 18, 10000 Zagreb

Mentalni Trening, Trnjansa cesta 63, 10000 Zagreb

Očna poliklinika dr Vukas, Ilica 129, 10000 Zagreb

Abstract:

Clinical Topic:

The main purpose of this presentation is to introduce optometrists with exercises that can help professional athletes and patients undergoing physical therapy improve their sensorimotor skills. In our center we combine optometry, ophthalmology, psychology and sports medicine. Our main goal is to help our clients reach their maximum physical and mental potential. By implementing our program professional athletes can improve their performance and patients undergoing physical therapy can speed up their recovery and get back to every-day life.

Content/Case Presentation:

The presentation will be focused on role of optometrists in such environment. We will explain how we can analyze sensorimotor skills such as visual clarity, contrast sensitivity, depth perception, dynamic vision, perception span, multiple object tracking, eye hand coordination, near-far focus alteration, peripheral awareness and target capture. Our main diagnostic tool is Senaptec Sensory Station which analyzes obtained results regarding age, gender, type of sport, level of competition and position within a team.

Actions Taken:

After the assessment we design a three-month individual Vision Training program designed especially for that client. Two times a week our clients train on Senaptec Sensory Station and improve specific skills such as eye hand coordination, peripheral awareness, depth perception, multiple object tracking, dynamic vision and near-far focus alteration. In office we also use balance boards, tennis balls, Marsden ball, Brock-String, Hart charts and other devices used in Vision Therapy programs. We also implement training with Senaptec Strobe glasses both in office and at home or on everyday practice (for athletes). If needed we design Home Vision Training program that helps our clients stabilize convergence, divergence, accommodation and improve binocular vision.

Recommendations/Conclusions:

Case reports will be provided that show how our clients improved over time with implementing our program. We will provide videos of our clients training on previously mentioned equipment. In conclusion we will show how optometrists can benefit from implementing similar programs in their everyday practice and help their clients improve skills they use in every-day life.

Changes in Front Corneal Surface at Patients Wearing Contact Lenses

Dana Trávníková[1]

Pavel Beneš[1]

[1]Department of optometry and ortoptic,
Masaryk University, Brno, Czech Republic

Abstract:

Clinical topic:

This study is focused on changes in the front corneal surface in patients wearing contact lenses.

Content presentation:

We presumed that front corneal surface may change during the day time while contact lenses are worn. Altogether 34 testing objects were involved in this study. At the beginning of the study, the front corneal surface was measured in investigated individuals without wearing eye lenses three times a day (9 AM, 12 PM, 17 PM).

Later, the (very) same individuals were measured before the application of contact lenses and after at least 8 hours of using the contact lenses.

Actions taken:

A corneal topograph and an auto-kerato-refrakto-tono-pachymeter were used for the front corneal surface determination. At the beginning, we have measured values at individuals without wearing contact lenses. The mean values (with standard deviation) of the front corneal surface measured on the corneal topograph device were: 7,72±0,03 mm at 9 AM, 7,71 ± 0,03 at 12 AM and 7,70 ± 0,03 at 5 PM whilst values on the auto-kerato-refracto-tono-pachymeter were: 7,73±0,03 mm at 9 AM, 7,73 ± 0,03 at 12 AM and 7,73 ± 0,03 at 5 PM. Later, every tested individual used specific contact lenses (BioTrue One day, Nesofilcon A, curvature 8,6, oxygen permeability 42 Dk/t, 78% water percentage) to fit his/her dioptric refraction. Contact lenses were worn in both eyes. Before the application the mean value (with standard deviation) of the front corneal surface measured on the corneal topography was 7,71±0,03 mm whilst 7,73 ± 0,03 was value measured on the auto-kerato-refracto-tono-pachymeter. Whereas after the 8 hours of eye lenses wearing we measured 7,72 ± 0,09 on the corneal topography device and 7,74 ± 0,03 on the auto-kerato-refracto-tono-pachymeter device. For the statistical evaluation, the student coefficient was used (P = 0,995, N = 200 and tPN = 2,592).

Conclusion:

The goal of this study was to determine statistically significant differences in changes of front corneal surface during eye lenses wearing. According to the obtained values we have not found any significant differences among measuring devices even after 8 hours of eye lens wearing.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Physiological Changes in Front Corneal Radius Within the Daytime

Dana Trávníková[1]

Pavel Beneš[1]

[1]Department of optometry and ortoptic,
Masaryk University, Brno, Czech Republic

Abstract:

Clinical topic:

This study is focused on physiological changes in front corneal curvature during the day time.

Content presentation:

The front corneal curvature is an important value especially when contact lenses are being inserted. We presumed that front corneal curvature changes during the day time and may affect overall refraction, even though overall feeling when contact lenses are worn during the day may change. The goal of this study was to determine whether there are significant changes in the front corneal curvature during the day time.

Actions taken:

Altogether 34 individuals (average age 21.5) were involved in this study. Three times a day (9.30 AM, 12 AM and 4 PM) a corneal topograph device and an auto-refractometer device were used to evaluate the corneal curvature. The mean values of the front corneal radius measured on the corneal topograph device were: 9.30 AM (7,733±0,047 mm), 12 AM (7,721 ± 0,046) and 4 PM (7,714 ± 0,044). The changes in the front corneal radius measured on the auto-refractometer device were: 9:30 AM (7,727 ± 0,047 mm), 12 AM (7,727 ± 0,047 mm) and 4 PM (7,729 ± 0,047). The results are mean values with the standard error of the mean. For the statistical evaluation, the student coefficient was used (P = 0,995, N = 200 and tPN = 2,592).

Conclusion:

Both devices used for evaluation have not observed any significant change during the day-time measurement. According to the obtained results, we can say, there is no significant change during the day in the front corneal curvature.

Impact on Gas-Permeable Contact Lens Parameters After Storage in a Non-Neutralized Hydrogen Peroxide Case During 1 to 30 Days.

Langis Michaud[1]

Anna Zarouk[1]

[1]Universite de Montreal

Abstract:

Purpose:

This study was conducted to measure the impact of storing large gas permeable lenses in a regular soft contact lens case, filled with non-neutralized hydrogen peroxide, during 1 to 30 days.

Methods: Twenty new scleral contact lenses, never worn, were used for this study. THey were soaked in a regular soft contact lens case, filled with a controlled volume of hydrogen peroxide solution (Alcon, Tx, US) for 1, 3, 7 and 30 days. Chemical analysis of its content was done at the same intervals, by iodometric titration with sodium thiosulfate. Lens parameters (power, diameter, base curve) were checked at every step (1-3-7-30 days), and the wetting angle was also evaluated at these moments (captive bubble, Image J software analysis).

Results:

There was no statistical difference in the chemical composition of the hydrogen peroxide over 30 days. There was no degradation of its composition during 30 days. Lens parameters were also not affected, except for the wetting angle, which showed a significant decrease over time. There was a statistical difference ($F16.64$; $p<0.001$), specifically between day 1 (16,73 deg) and 7 (13,96 deg), 1 and 30 (13,15 deg), 3 (15,50 deg) and 7 and 3 and 30 days (ANOVA for repeated measurements, with Bonferroni posthoc testing).

Conclusion:

Storing gas permeable lenses in a non-neutralizing case seems to preserve the lens parameters. and may be considered a valid option.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Visual Health Promotion in the School Environment

Amélia Fernandes Nunes[1], Marta Gonçalves[3], Pedro Monteiro[1]
Francisco Ferreira[1], Carlos Martins[2], Henriqueta Forte[2]

[1]Universidade da Beira Interior, Centro de Investigação em Ciências da Saúde (CICS); Centro Clínico e Experimental e Ciências da Visão (CCECV)
[2]Unidade de Saúde Pública (USP); Agrupamento de Centros de Saúde Cova da Beira (ACeS CB)
[3]Universidade da Beira Interior, Master students (Optometry and visual science)

Abstract:

Introduction:

Promoting visual health is getting more important because of today\'s visually demanding lifestyles. Promoting healthy practices during adolescence is crucial for the prevention of health problems in adulthood and schools are in an ideal position to promote and maintain health.

Propose:

To provide specific knowledge in a sample of adolescents that will enable them to promote and protect their visual health and determine if visuo-postural habits change after health promotion actions.

Methods:

Students from the 6th and 7th grade participated, with a total of 112 students, aged between 11 and 14 years. The 6th grade benefitted from the training actions, but the 7th grade did not.

Training actions took place in the classroom of 6th grade students, involved 65 adolescents and ran for two months. They were given information about the visual system, the most common visual symptoms of eye strain and guidelines to promote visual health in various contexts such as in the classroom, at home and on the street.

Both groups (6th and 7th grade) answered a questionnaire in the classroom, about visual habits, before and after the training actions.

Results:

Regarding the training actions, the knowledge of the students increased significantly. In general, there were significant improvements of visual and postural habits, in the first two weeks, followed by a relapse in most of the habits. The frequency of use of sunglasses outdoor, on sunny days, increased significantly throughout the follow-up period (Wilcoxon test (Z=-2,651; p=0.008)).

Comparing the behaviour of the control group (7th grade) with the experimental group (6th grade), it was observed that the students' habits of the experimental group improved comparatively to those of the control group, but without statistical significance. However, in the posture "sitting at the desk for reading or writing", the improvement was significant (Mann Witney teste (U=968; p= 0,002)).

Conclusion:

This study concludes that training actions are effective in increasing knowledge about visual health, and contributes to the adoption of healthier habits. It should be noted however, that the short time frame for follow-up did not allow significant changes in most of the visuo-postural habits adopted by the students.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Modern Corneo-Scleral Contact Lenses Fitting in Keratoconus Patient with Progression: a Case Report

Angel Chun-Ki Wong[1]

Katherine Hiu-Yan So[1]

[1]The Hong Kong Polytechnic University

Abstract:

Clinical Topic:

Modern corneo-scleral contact lenses fitting in keratoconus patient with progression: A case report

Content:

A 36-year-old Chinese female, TD, was diagnosed with keratoconus in both eyes since 2004. She came for an eye check and requested for a contact fitting because of the lens irritation and blurry vision in her left eye. Corneal topography showed the severity of keratoconus was mild in the right eye but moderate in the left eye. She used her own RGP lenses for 1 year (RE) and 3 year (LE) respectively. Contact lens fitting was acceptable in RE. However, the left lens was too steep at central while lens edge was too flat resulting in lens irritation.

Contact lens fitting:

Considered that the irregularity in her right eye was very mild, she was fitted with regular RGP in her right eye. On the other hand, the left eye condition was more severe and she needed to fit with special keratoconus-designed rigid lenses for visual correction. Good visual performance can be achieved using these type of lenses. However, the patient started to report blurriness in the left eye after several years due to progression of the disease. Modification of lens parameter did not show any improvement. Thus, the patient was refitted with larger diameter corneo-scleral lenses which was meant to correct the irregularity and aberration more effectively.

Recommendations & Conclusion:

Corneal RGP, which performance will be highly affected by corneal profile, has many restrictions or limitations such as uncomfortable lid reaction and centration problem. Once the disease progress, the lenses may no longer be able to provide a satisfactory vision for patients. Therefore, large diameter contact lenses started to play an important role in visual correction of patients suffering from corneal irregularity in modern society. Corneo-scleral lenses, which rest on both corneal and scleral, provide a higher level of comfort and more steady vision to patient comparing to the corneal RGP. It is important for optometrists to make consideration to switch lens types and use different modern corneo-scleral lens design for improving the lens performance in terms of comfort, ocular health and vision.

Statistical Study of the Arteriovenous Thickness Ratio of Fundus to Young People

Evangelos Pateras[1]

Rafaella Leontiou[1]

Antonios Nousi[1]

[1]Athens University of Applied Sciences – A.T.E.I. of Athens

Abstract:

Introduction:

1) Retinal arteries: During fundoscopy, the arteries appear brighter and narrower than retinal veins (arteriovenous 2: 3 or 4: 5 ratio).
2) Retinal veins: the perivenular capillaries are formed in four main branches (superotemporal, inferotemporal, superonasal and inferonasal) after the separation of the central retinal vein at the optic disc.

Purpose:

Compare the ratio of the thickness of the veins and the arteries of fundus, to young adults aged 18-24 years.

Methodology:

A sample of fundus images from 100 students, taken from a non-mydriatic fundus camera drs, at the facilities of A.T.E.I. of Athens.

Subsequently, based on the sample, the thickness of the veins and arteries was measured and recorded in an Excel database, where the arteriovenous ratio was calculated of each fundus for each eye separately. By means of computational tables and diagrams using the excel program, we compared the ratio of the whole sample as well as by gender criteria and grouping right and left eyes.

Results:

Of the 200 eye fundus examined, irrespective of gender and right and left eyes, it was estimated that the average arterial thickness was 2,35 and the average vein thickness was 2,93. The average thickness, regardless of sex, was calculated: for the right eyes 2,37 for the arteries and 2,91 for the veins and for the left eyes 2,33 for the arteries and 2,95 for the veins.

Conclusion:

In the set of all measurements and results, we find that the ratio of arteriovenous thickness of the fundus is approximately in a range of 2,35 : 2,93 (i.e. about 4/5), taking into account some standard deviations due to measurement errors. It is a normal admitted value if we take into account that the patients who examined were young people with a healthy fundus image.

Comparative Study of the Horizontal & Vertical Ratio of Cup/Disc Of Optical Nerve in a Population Aged 18-24 Years (Athens University of Applied Sciences – A.t.e.i. Students) Using a Non-Mydriatic Fundus Camera

Evangelos Pateras[1]
Marianthi Stergiou[1]
Rafaella Leontiou[1]
Antonios Nousi[1]

[1]Athens University of Applied Sciences – A.T.E.I. of Athens

Abstract:

Purpose:

Comparison of horizontal and vertical cup/disc diameters of the ophthalmic nerve head and their ratio (cup-to-disc ratio) from images taken from 18-24 year old people taken from the sea-bed camera without mydriasis.

Method:

Selected 50 healthy patients aged 18-24 (in 50 patients representing 30 women and 20 men) were discussed and the right and left eye (100 eyes) with two different fundus cameras (without mydriasis) ZEISS VISUCAM 200 and drs automated fundus / retinal camera. The pictures were taken at an angle of 45 ° to focus head and nasal. From the photograph, with the aid of a ruler by human administration, a measurement of the dimensions of the optic nerve head horizontally and vertically. Even calculated the ratio of the diameters in each eye and patient, the maximum value, minimum value, average price and the divergence in tabular excel. Be stressed here that the results in the two dimensions of the optic nerve as the digital fundus camera does not capture depth as other fundus imaging device (e.g. HRT).

Results:

Estimated that in 50 patients, 100 eyes, women and men, with the right and left eye, horizontal and vertical measurement of internal-external optical disc diameter, the average horizontal measurement condition is Average (H) = 0.3876, the average vertical measurement condition is Average (V) = 0.3697

Conclusion:

All the 50 patients had an average cup-to-disc ratio horizontal (H) = 0.3876 and vertical (V) = 0.3697 which is in the normal limits expected

Statistical Study of Cornea with the Help of a Placido Topography and its Correlation with the Best Fitting Curve in Rectangular and Oblique Meridians

Evangelos Pateras[1]

Rafaella Leontiou[1]

Antonios Nousi[1]

[1]Athens University of Applied Sciences – A.T.E.I. of Athens

Abstract:

Introduction:

The normal cornea is aspherical and shows a small degree of asymmetry. The aspherical conic sections such as the cornea are described by a single equation:

$$y2 = 2r0x-px2$$

Where r0 is the radius of curvature of the surface at the top and the type of conic section depends on the value of p, p is the number whose value determines and the type of surface.

Purpose:

Using Placido topographer CSO Phoenix, 30 people (A.T.E.I. of Athens students) were measured and refractive maps were taken from the corneas of those participants.

Method:

We excluded map samples where astigmatism in the central 3 mm measurement was < 0.50 Dc. The refractive power was taken at the horizontal (180°), vertical (90°), and oblique axes (45° and 135°) for each of the 30 people (A.T.E.I. of Athens students).

Results:

Taken the refractive powers for example as it is seen in Fig.8, firstly at 180° (46.78, 45.50, 44.65, 44.41, 45.12, 46.30) at 90 ° (45.86, 44.71, 44.09, 45.10, 46.07) at 45 ° (45.49, 45.51, 46.85) and at 135 ° (46.18, 45.47, 45.32) we tried to find using the best fitting curve equation that represents the curve that each meridian had according to the data selected. The polynomial best fitting curve matching the curvature of the cornea at 180o is y = 0,3343x2 - 1,82x + 45,178, at 90o is y = 0,4343x2 - 2,1466x + 45,791 at 45o is y = 0,2805x2 - 1,2659x + 44,494, at 135o is y = 0,3404x2 - 1,6032x + 44,856.

Conclusion:

The results showed that the shape of the cornea varies in the various meridians (e.g. 180° or 90°) and even with oblique meridians (e.g. in the nasal relative to the temporal side) and does not have the same curvature.

The Perception of Color Testing in Early Detection of the Macular Diseases

Lucie Patockova[1]

Petr Vesely[1]

[1]Masaryk university, Department of optometry and orthoptics

Abstract:

The perception of color testing in early detection of the macular diseases is a dissertation research implements at the Clinic of Eye Diseases and Optometry in the Faculty Hospital St. Anne, Brno, Czech Republic

People over fifty are in risk group of the degenerative changes in the retina. The most common cause are Age-Related Degeneration (AMD) and diabetic retinopathy, that affect primary vision because of macular involvement.

In developed countries is an AMD the leading cause of practical blindness. Diabetic retinopathy is the leading cause of complete blindness.

Color perception test is performed on the experimental (38 people) and control group (28 people). The experimental group, which has diagnosed a disease affecting the macula, and a control group without diagnosed eye disease.

First time is measured the visual acuity of probands with the correction and then is conducted Lanthony D-15 Standard test and Lanthony D-15 desatured test. Testing is done monocular. In conclusion is detected density of eye lens by Pentacam because of the exclusion of probands with a high degree of cataract.

Subsequently is evaluated statistically average value of the angle (confusion angle), TES (total error score), S-index (selectivity index), C-index (index confusion) and FTS with standard and desatured test. The results are compared between the two groups in order to determine whether is there a statistically significant difference.

First results show a statistically significant difference in the average TES (t-test; $p < 0,05$), C-index (t-test; $p < 0,05$) and FTS (t-test; $< 0,001$) for right eye and in the average TES (t-test; $p < 0,05$), C-index (t-test; $p < 0,05$) and FTS (t-test; $< 0,05$) for the left eye.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Measure of Fusional Vergence by Tranaglyphs & Vectograms in Optometric Practice

Beáta Kovačovicová[1]

Petr Veselý[1]

[1]Masaryk University, Department of Optometry and Orthoptics

Abstract:

Clinical topic:

The optical fusion is an ability to combine images from two eyes to form one visual perception. This is achieved through fusional motor vergence. The vergence enables to maintain the binocular vision by a range of induced vergences until the diplopia is exhibited in the patients (if the binocular vision is interrupted). The physiological range of fusional vergence was described in 1948. The value of patient vergence contains a relevant information for the correct diagnostic and subsequently a proper compensation.

Content or case presentation:

The measurement of fusional vergence belongs to the fundamental, very fast, but also very frequently overlooked technique in routine optometrists practice. In this study the differences between the tranaglyphs and vectrograms researched in clients results that are daily exposed to the artificial light sources (e.g. monitors, mobile phones, tablets) and the results of the defined control group are shown. The main beneficial effect of introducing those examination methods to the regular screening is in the early detection of developing pathological changes.

Actions taken:

During the process of researching, the fusional vergence was measured in all patients and clients, older than 15 years. The subjects were divided into groups based on their health predispositions and an average day use of the electronic devices reported. The tranaglyphs were measured with anaglyphic glasses; the examination distance was 40 cm. For the vectrograms, the polarisation filters were used. Both measured values were noted in the lower part of the test in the pD.

Recommendations/Conclusion:

In our presented study we are highlighting the benefits of the integration of the measurement of a fusional reserve into normal practice. The changes in the accommodation-vergence system (such as heterophoria) can be uncovered by this approach. The early identification and following compensation in an astenopic stage can prevent further decompensation and consecutive diplopy. Via this simple examination procedure, the naming of abnormal vergence fusion in the short distance is highly likely. In the today world, full of the increasing requirements of the all-day use of the electronic devices (with working distance 40-80 cm) is this, however, extremely important.

Influence Of Heterophoria on the Computer Work

Nicol Dostálová[1]

Petr Veselý[1]

[1]Masaryk University, Department of Optometry and Orthoptics

Abstract:

Clinical topic:

Heterophoria is (in fact) a type of latent strabismus most commonly caused by the malfunction of extraocular muscles; however, this malfunction is not visible at first sight. It can cause headaches, blurred vision, double vision or diplopia. These problems manifest themselves most frequently when working on distances lower than 70 cm – nowadays it applies mainly to computer work.

Content or case presentation:

This study focuses on patients (older than 15 years, of all genders and refractive errors) suffering from heterophoria which causes problems while working on a computer. Every patient undergoes the eye examination described below and then continues to the eye-tracking measurement. Results of this group are compared with the orthophoric patients to verify the influence of heterophoria on the computer work.

Actions taken:

During the period of this study, every patient completes a reliable and valid questionnaire which is focused on the information related to the patient\'s work on a computer. Then, it is focused on the basic examination (visual acuity, objective and subjective refraction using the trial frame) and then, with best vision, it continues with examination of heterophoria on the long distance (6 m) and 70-cm-distance, using the von Graefe prism to separate the visual perception. The other part of the investigation deals with the eye-tracking method which is used, in this case, for measuring the speed of eye movements in patients with heterophoria at the beginning and later after of working on a computer to reveal whether heterophoria influences the efficiency of the work on a computer or not.

Recommendations/Conclusion:

We expect that heterophoria has negative influence on the long – term computer work. The worse the heterophoria is, the graver problems it can cause. All hypotheses are verified by eye-tracking method based on the comparison of subjects with orthophoria and patients suffering from heterophoria.

The Re-emerging Face of Tuberculosis in Europe

Konstantinos Katsoulos[1]

Anastasios Anastasakis[1]

Panagiotis Zafirakis[1]

Gerasimos Livir Rallatos[1]

[1]Athens Eye Hospital

Abstract:

Clinical topic:

To present 6 cases of tuberculosis patients, 5 of them with ophthalmological findings, and 1 monitored for optic nerve toxicity to ethambutol.

Case presentation:

Retrospective case series. 1 patient presented with total ophthalmoplegia of the left eye, and subsequent testing revealed tuberculosis (and hence tuberculosis of the nervous system). 1 patient presented with bilateral papilledema and central retinal vein occlusions due to tuberculous meningitis. 1 patient presented with a large tuberculoma (granuloma due to tuberculosis) in the choroid. 2 patients presented with serpiginoid choroiditis, an autoimmune response of the choroid to TB antigens. 1 patient had no opthalmological findings, but was followed up for concern of ethambutol (an anti - TB drug) optic nerve toxicity.

Actions taken:

In the case of the patients with ophthalmoplegia, tuberculosis was diagnosed from subsequent testing, with ophthalmoplegia as the manifesting symptom. The other cases were co-managed with the infectious disease specialists, as tuberculosis had already been diagnosed. They were either on anti-TB medication, consisting of the classic regimen of 4 drugs (rifampicin, pyrazinamide, isoniazid, ethambutol), or were out of medication as they were considered cured of clinical TB. In the last case, there were no ophthalmological findings, but the patient was monitored for optic nerve toxicity to ethambutol, an anti - TB antibiotic drug.

Conclusion:

Tuberculosis is an re-emerging problem in the developed world. As it may imitate many diseases, clinicians should be highly suspicious of this infectious disease.

Unusual Prevalence of Color Vision Defects in Children From a Small Bulgarian Town

Mila Dragomirova[1]

Snejana Iordanova[1]

[1]Sofia University

Abstract:

Purpose:

During the last 4 years optometrists have become progressively involved in children vision screenings in Bulgaria. The timely detection of vision problems in children is a challenge in the country. The Sofia University and the Bulgarian Association of Optometrists have made a systematic attempt to overcome this challenge. Vision screenings have been organized as social entrepreneurship, student practice and cooperation with other universities, and additionally aim to demonstrate good practice of working together with ophthalmologists. Color vision, as one of the important attribute of visual perception, is investigated during the screening session of 203 school students between 6-18 years old, from a small town Sapareva Banya.

Method:

The examination was performed through Ishihara pseudoisochromatic plates, Farnsworth D-15 test and Lanthony Desaturated D-15 test. The administration of the used plates and arrangement test has been done according to their requirements with respect to lighting, viewing time, and testing distance. In the interest of saving time during the screening the tests have been administered binocularly. The students have been wearing their refractive correction, in case of proven need, and there was no tint in the glasses or contact lenses.

Results:

According to the Ishihara plates among the 87 boys and 116 girls, 9.2% and 4.31% respectively, had a defect. The statistically processed data from color vision tests have been compared with other known data from Europe. The typical presence of such defects is approximately 7.0% and 0.5% for males and females respectively.

Conclusion:

None of the students have previously been tested for color perception. Respectively, in many cases, there was no awareness among the students, parents and teachers of the presence of color perception problems. Since a higher prevalence of color vision defects was discovered among the children, it would be of interest to investigate the prevalence of such defects among the adult population of the town. The next step would be to determine the underlying causes.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

The Impact of Different Materials on Soft Contact Lenses with Varying Wearing Time

Vasilena Panayotova[1]

Hristina Valeva[1]

Nikola Peev[1]

[1]Sofia University "St. Kliment Ohridski"

Abstract:

Purpose:

Increasingly people, who need refractive correction, prefer using soft contact lenses. Due to the fact, that the lenses are very common, the users don't have the needed knowledge, regarding their use, the materials, they're made of, and their impact on the eyes.

Our goal was to reach objective assessment of how different materials and wearing times of the contact lenses affect the front eye surface and the eye appendages, as well as subjective patient evaluation.

Methods:

We closely observed 8 patients, wearing soft contact lenses with different wearing time (daily and monthly), which are made of different materials, namely silicone hydrogel and hydrogel.

For the research we were using Zeiss slit lamp biomicroscope. Our checkpoints were the 1st and 15th days of the wearing time of the particular lens. We were examining for bulbar, limbal and tarsal redness, as well as corneal neovascularization, assessing the results, based on the Brien Holden Vision Institute Grading Scales, along with observing the behaviour of the tear film via specular microscopy.

Furthermore, the patients were answering a set of questions every fifth day and the answers were assessed according OSDI (Ocular Surface Disease Index) to evaluate their subjective comfort.

Results:

The results were quite satisfactory. Regarding the daily lenses, there weren't any significant differences between the first and the last day and all the results were within normal limits. Silicon hydrogel lenses performed better in both the objective and subjective assessment of the patients. Regarding the monthly lenses, the results were pretty the same, again the silicon hydrogel lenses showed marginally better overall performance, however there was worse wetting of the lens by the end of the experiment.

Conclusion:

To conclude, patients, using contact lenses don't feel any noticeable difference when wearing lenses, made from either silicone hydrogel or hydrogel, with daily or monthly wearing time. In result of the observation of the changes in the tear film, as well as the discomfort, caused by longer wearing times of hydrogel contact lenses, our patients said they would rather switch to using silicone hydrogel lenses.

Influence of Near Overcorrection in Subjective Satisfaction in Wearers of Progressive Addition Lenses

Melisa Subero[1]
Marta Alvarez [1]
Eva Chamorro[1]
Jose Miguel Cleva[1]
José Alonso[1]

[1]Indizen Optical Technologies (IOT)

Abstract:

Purpose:

Well-designed free-form personalized progressive power lenses (PPLs) provide users with the right addition at near reference point (NRP). Classical front-side PPLs usually introduce oblique aberrations at NRP with some cylinder and an effectively higher add. ECP and/or lens manufacturers worry about the users complaining because of the actual "smaller" addition provided by the free-form PPL, specially if the user wore front-side progressive before. This worry can be magnified after lens testing, as the lensometer reading for free-form PPL is usually smaller than that of front-side PPL. Because of this, addition over-prescription tends to be a common practice among ECPs, and some manufacturers offer increased addition as default. However, any unnecessary increase of the addition compromises other lens properties, specially at intermediate vision. This study compares the personalized PPLs performance, with and without this overcompensated addition to determine its effect in terms of wearer perception.

Method:

30 (57,17±5,19) presbyopic subjects participated in this double mask trial. 2 personalized PPLs with the same progressive design were tested: CL-Control had the prescribed near addition power as determined by the optician during the refraction and OL-Overcorrected had addition 0.25D higher. Subjects were asked to wear 2 glasses (CL&OL). Quantitative scores (scale 0-10) were given by them the first time and after 7 days using both lenses. Besides, they had to choose the best lens for different everyday visual tasks and the one they considered better in terms of adaptation. Data were analyzed by Statgraphics Centurion XVI.II software.

Results:

Regarding wearers opinion, CL got significant better overall first impression (p.=0,02). Adaptation tended to be faster (p.=0,08) with CL and was significantly preferred by 43% of wearers compared to 20% whose preferred OL for far vision activities.

Conclusion:

Addition over-prescription is sometimes applied to personalized PPL, so they provide a near-vision lensometer power closer to that of conventional PPLs. Results show no advantages in using an overcorrection on the addition and even more, lenses without overcorrection got statistically significant better.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Influence of Mean Sphere Power Distribution in Subjective Progressive Lens Wearers Satisfaction

Amelia Gonzalez [1], Pablo Concepcion[1], Eva Chamorro[1]
Jose Miguel Cleva[1], Jose Alonso[1]

[1]Indizen Optical Technologies. SL

Abstract:

Purpose:

The main optical figures used to assess the performance of progressive lenses (PPLs) are the main power profile and the astigmatism map. However, in turns out that the peripheral distribution of mean sphere also plays a significant role on lens performance. The goal of this study is to analyze the influence of the average value of the mean sphere in the peripheral regions of the PPLs, mainly to the nasal and temporal sides of the upper intermediate and far regions.

Method:

45(57,52±5,35) presbyopic subjects with experience using PPLs participated in this observational, prospective and double mask trial. PPLs were created ad-hoc for this study, and manufactured with a variable frontal curvature. Each wearer tested two pair of lenses having a similar cylinder map. One of the pairs have a design with a mean sphere map with positive values in the peripheral areas of the lens (lens A). The other one was designed to have a flatter mean sphere distribution at the periphery, having an average value closer to zero in these lateral parts (lens B). Subjects were asked to score designs in a scale from 0-5 for different tasks, when they wore them for the first time and after 7 days of use. In addition, they were asked to choose the best lens for each task. Statistical analysis was performed using Statgraphics Centurion XVI. II software.

Results:

Regarding to wearers opinion, B lenses got statistically significantly better in overall (p=0.03) and intermediate vision (p=0.04), first impressions. After 7 days, the vision in electronic devices was better for B lenses (p=0.05), and it was significantly preferred by 42% of wearers at far vision (p=0.005), 44% at intermediate vision (p=0.01) and 53% in overall satisfaction (p=0.03).

Conclusion:

PPLs having peripheral distribution of mean sphere close to zero diopters seems to provide better performance in terms of overall satisfaction and at far and intermediate tasks, but they don't provide any significant improvement for near vision. As a result, mean sphere power distribution plays a key role in the visual performance of the lens and affects significantly the wearer satisfaction of the PPLs.

Are we Assessing Children's Vision Properly?

Núria Vila-Vidal[1], Núria Vila-Vidal[2], Laura Guisasola[1]

Jordi Alonso[3], Ricard Tresserras[4]

[1]Centre Universitari de la Visió. Universitat Politècnica de Catalunya

[2]Dep. Ciències Experimentals i de la Salut. Universitat Pompeu Fabra

[3]IMIM. Institut Hospital Mar d'Investigacions Mèdiques.

[4]Direcció General de Planificació en Salut. Generalitat de Catalunya

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Abstract:

Purpose:

This study aims to highlight the importance of evaluating binocularity, accommodation and ocular motility in children with symptoms or poor academic achievement, even if the refractive error is corrected and the visual acuity is good.

Method:

A team of optometrists annually perform eye exams in the third year of primary school children (8-9 years) in the city of Terrassa (Barcelona). The data collected between 2007 and 2015 correspond to 1,614 children (698 boys and 896 girls). The optometric examination includes three main areas: refraction, visual acuity and visual function including the set of binocularity, accommodation, and ocular motility during reading.

Results:

641 schoolchildren (40.2%) presented alterations in at least one of the tests, and it was common for the subject who presented alterations to do so in more than one test.

The refractive error distribution identified a total of 148 myopic students with refraction lower than -0.25 D (9.3%, CI 95%:7.9-10.7) and 173 hyperopic children with refraction greater than +1.25 D (10.9%; CI95%:9.3-12.4).

101 subjects presented low values (< 0.7) of visual acuity (6.3%, CI95%:5.1-7.5) either because they do not wear glasses and should wear it or because it was incorrect.

We analysed the visual function results of the 1445 subjects who had shown good visual acuity, either because they were emmetropic or because they wear glasses. 234 students of them (16.2%, CI 95%:14.3-18.1) presented binocular dysfunctions, 176 (12.2%, CI95%:10.5-13.9) presented accommodative alterations and 234 (16.2%, CI95%:14.3-18.1) have ocular motility dysfunctions during reading. In none of the cases, the differences between sexes were statistically significant.

Conclusion:

Almost half of the schoolchildren aged 8-9 years have some visual dysfunction undetected or uncorrected. Among children with good visual acuity, we also found binocular, accommodative and ocular motility dysfunctions.

Health professionals, family members and teachers must be aware of the possible existence of these alterations because the associated symptoms could difficult the schoolchildren's visual comfort and interfere in their learning.

It would be necessary to include tests as an alert for alterations of the visual function in the routine of visual child assessment.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Polarizing Sunglass Lens Materials – Serbian Market Study

Elvira Djurdjic[1], Jovana Mrdjen[1], Zeljka Cvejic[1]

[1]Faculty of Science, Department of Physics, University of Novi Sad, Trg Dositeja Obradovica 4, 21000 Novi Sad, Serbia

Abstract:

Purpose:

Polarizing lenses may provide numerous benefits to the wearer such as glare reduction, eye strain reduction as well as improving eye comfort and vision quality. Some research shows that blinding sun glare may cause snow blindness as well as cataracts in some extreme cases, thus using good quality polarizing lenses may prevent these damages. Market is overwhelmed with different kind of polarizing sunglasses and our motivation was to examine the quality of them.

Methods:

Analysis has been done using Thermo Scientific DXR Raman spectrometer coupled with DPSS 780nm laser with power level 24mW, CCD camera as detector, and OMNIC software for collecting and analyzing spectra. Characterization of materials have been done using ThermoScientific Fisher Raman spectra database. We have chosen this vibrational spectroscopy technique as very quick, reliable, precise and non-invasive.

Results:

Obtained results have shown that some products have bad polarizing filters or do not have it at all. Some lenses have traditional layered structure containing layer of allyl diglycol carbonate doped with iodine (CR-39). Depth profile measurements confirmed layered structure of lens by decreasing of iodine peaks (107 and 155 cm-1) intensity in spectra. Other lenses were made of pure polycarbonate, matching 99.1% the database spectra of polycarbonate. Depth profile measurements of these lenses showed uniform structure of lens, confirming the polarizing property of material without layering.

Conclusion:

Different material, quality and price range polarizing lenses can be found on Serbian market, as our research has shown. Sales of sunglasses with polarizing lenses are growing year after year. This indicates the awareness of the vision health and quality of the Serbian population.

Reproducibility and Reliability of Transpalpebral Measures of Intraocular Pressure

Alessandro Fossetti[1], Elena Coppa[1], Erisiola Vallaj[1]

Giampaolo Lucarini[1], Giuseppe Migliori[1]

[1]Institute for Research and Studies in Optics and Optometry (I.R.S.O.O.) VINCI, ITALY 2)
University of Florence, FLORENCE, ITALY

Abstract:

Purpose:

To assess the reproducibility of the Diaton Transpalpebral Tonometer (DTT) and to evaluate whether measuring intraocular pressure (IOP) by DTT in clinical practice, or for screening purposes, could be an alternative method to the use of Goldmann applanation tonometer (GAT) carried out using a contact lens (GAT-CL).

Method:

The right eye IOP of 66 volunteer students aged between 18 and 35, with healthy corneas, corneal astigmatism < 3.00D and corneal curvature >7.40 mm was measured by DTT by two different operators. The two measures were taken in a random order with a two-minute interval. After one week 35 subjects out of the 66, underwent an IOP measure by both DTT and GAT-CL. The measures were taken at five-minute intervals in a random order. The agreement between the two techniques was determined using the Bland-Altman method.

Results:

The mean measures of the two operators were 16.82mmHg±3.26, and 16.48mmHg±2.98, with a mean difference of -0.33 mmHg±2.00. The mean difference was not statistically significant ($p = 0.18$) with a good correlation ($r = 0.80$). According to Bland-Altman analysis, upper and lower limits of agreement were +3.67mmHg and - 4.33mmHg, respectively.

The mean pressure measured by GAT-CL (15.3mmHg±2.1) was 0.42mmHg (± 2.9) higher than the one taken by DTT (14.9mmHg±2,8). The correlation between the two sets of measurements was quite poor($r = 0.28$). Upper and lower limits of agreement were +5.38 and -6.22 mmHg, respectively.

Conclusion:

The reproducibility of DTT measurements was quite good, but the Bland-Altman analysis indicated a poor agreement with the GAT-CL results. These results did not allow to conclude that DTT can be used as an alternative to GAT-CL in clinical practice. Since the sample consisted of young subjects with intraocular pressure not exceeding 21 mmHg, future studies should include aged patients, and patients with higher IOP, in order to assess the suitability of DTT for screening activities.

Symmetry of Ocular Length and Retinal Sensitivity in Myopia, Emmetropia and Anisometropia

Sven Jonuscheit[1], Saleh Alhussain[2], Edward Mallen[3], Niall Strang[1]

[1]Glasgow Caledonian University
[2]Oyun Hospital
[3]University of Bradford

Abstract:

Purpose:

To investigate the inter- and intra-ocular symmetry of cornea-to-retina length and retinal sensitivity in three refractive groups.

Methods:

Healthy individuals aged between 18 and 45 years with myopia, emmetropia and anisometropia were invited to take part. Central and peripheral cornea-to-retina length were measured in both eyes at 30 degrees eccentricity with partial coherence interferometry (IOL Master, Carl Zeiss Meditec, Jena, Germany). Retinal sensitivity was assessed centrally and at 30 degrees using the 30-2 SITA Fast strategy on the Humphrey Visual Field Analyzer II (Carl Zeiss, Oberkochen, Germany). To determine inter- and intra-ocular differences in cornea-to-retina length and peripheral retinal sensitivity of right and left eyes were compared for each of the refractive groups (one-way analysis of variance (ANOVA) and the Scheffe post-hoc test). Meridional differences were assessed with the paired t-test and correlation analysis was used to investigate the interrelationship between cornea-to-retina length and peripheral retinal sensitivity.

Results:

Twenty-eight myopes, 15 emmetropes and 14 anisometropes participated. Cornea-to-retina length and retinal sensitivity showed a high degree of interocular symmetry and low interocular variability for corresponding peripheral locations ($p \geq 0.770$ and 0.107 respectively). Between-group comparisons of retinal sensitivity indicate no clinically significant differences between the three refractive groups. Intra-ocular comparisons revealed small, but inconsistent meridional differences in cornea-to-retina length and peripheral retinal sensitivity (e.g. when comparing superior vs inferior and temporal vs nasal locations). In myopes, peripheral retinal sensitivity was slightly lower at locations along the vertical meridian as compared to those along the horizontal meridian. Peripheral retinal sensitivity was independent of ocular length ($p > 0.05$).

Conclusion:

Cornea-to-retina length and peripheral retinal sensitivity show high interocular symmetry between right and left eyes in healthy pre-presbyopic individuals with myopia, emmetropia and anisometropia. With axial length being the primary determinant in axial myopia and myopic anisometropia, the fellow eyes of the same individual appear to develop largely symmetrically.

Changes in Age-Normalised Prevalence for Common Eye Conditions in Scotland

Abeeda Khatoon[1]

Niall Strang[1]

Gunter Loffler[1]

[1]Glasgow Caledonian University

Abstract:

Purpose:

In 2006 the role of optometrists in Scotland was enhanced to include diagnosis and management of common eye conditions whilst improving access to eyecare across communities. Resultantly, optometrists record information about a range of eye conditions following each patient examination. This large data set provides an opportunity to examine changes in reported eye conditions over a ten year period.

Methods:

Data were collated from the General Ophthalmic Services forms submitted by optometrists. This analysis focused on the 3 most prevalent ocular conditions: Cataract, Age Related Macular Degeneration (Macular Problems) and Glaucoma. The total number of patients diagnosed with these conditions was expressed relative to the respective population/health board and age bracket.

Results:

In 2015/16 the total number of patients diagnosed with each of these conditions across Scotland was: Cataract 410,686, Macular Problems 117,596, Glaucoma/Ocular Hypertension (OHT) 61,361. Expressed as a fraction of the total population (5,327,700), the calculated prevalence was: Cataract 7.70%, Macular Problems 2.21%, Glaucoma/OHT 1.15%. Age-normalised (over 60 years for Cataract and Macular problems =1,299,996, over 50 years = 2,357,917 for Glaucoma) prevalence was: Cataract = 31.59%, Macular Problems = 9.05%, Glaucoma = 2.60%. In 2006/07, the figures were Cataract 15.24%, Macular Problems 5.11%, Glaucoma/OHT 1.31%. The change in Cataract and Glaucoma/OHT represents an approximately linear increase over the ten year period. In contrast, Macular Problems showed a sharp increase in recorded prevalence between 2006 and 2009 followed by a plateau. The data for Scotland as a whole are well mirrored by each of the Health Board areas.

Conclusion:

For two of the most prevalent ophthalmic conditions, data across Scotland shows substantial, approximately twofold, increase in age normalised prevalence over the past 10 years. These increases are likely linked to both the aging population and the increase in access to eyecare in Scotland. However, the inconsistent pattern of prevalence change for the different eye conditions argues that the increase in prevalence cannot be attributed solely to an ageing population. These data should prove useful for the planning and resourcing of eyecare provision.

Evaluation of Patients Attending an Enhanced Eye Care Service in the Uk

Nik Sheen

Cardiff University

Abstract:

Purpose:

To describe patient demographics and how far patients travel to access an enhanced eye care service in the UK.

Method:

Audit data from an enhanced eye care service where patients visit an optometrist if they have an acute eye problem, have been referred by another healthcare professional or have an increased risk of eye disease are described. Data from 116,834 patient visits over 15 months (between January 2016 and March 2017) was captured. Patient age, ethnicity and descriptors of residence were analysed using postcode data. Using statistical software and Geographic Information Services (GIS), patient journey times and distances travelled was obtained.

Results:

The mean average age of the patients was 56.3 years (SD 22.7) with over 46% of patients over the age of 65 years old. 94.9% of patient\'s ethnicity was White with 2.8% Asian/ Asian British and 1.1% Black/ Black British. 71.5% of patients reside in an Urban location with 28.5% from a Rural location. 24.1% of patients attending were from a Communities First area (the poorest localities). 74.6% of patients travelled less than 5 miles to access the service with travel times taking less than 10 minutes for 57.5% of patients.

Conclusion:

The service is accessed by a wide age range of patients with the commonest age range between 65-74 years. The majority of patients live in Urban areas and are of White ethnicity. Three quarters of patients access services close to where they live (less than 5 miles) with travel taking less than 10 minutes for the majority. The service is accessed by those that live in the poorest areas. This data can be used to demonstrate good equity of access for patients accessing services and be used to plan future promotion of eye care services in the UK.

The Repeatability of Alvarez Lens Spectacle Adjustment

Niall Strang[1]

Alison Guthrie[1]

Mhairi Day[1]

[1]Glasgow Caledonian University

Abstract:

Purpose:

Alvarez lens spectacles can be self-adjusted to a reasonable level of accuracy although residual cylindrical errors often reduce visual acuity (VA) compared to values obtained following auto-refraction. Modern auto-refractors are known to measure in a repeatable fashion however there is uncertainty as to how this applies to the Alvarez lens adjustment. In this study we compare the self-adjusted refractive error and VA values found in two separate pairs of Alvarez lenses.

Methods:

108 participants with an age range 18-81 (mean 39 ± 18.9) years, were asked to adjust the power of each lens in two separate pairs of Alvarez designed adjustable spectacles (-6 /+3DS), in accordance with the manufacturer's instructions. Inclusion criteria were based on the published recommendations of the manufacturer. Refractive error and LogMAR VA values obtained using the two pairs of spectacles were compared. The powers of both pairs of spectacles were measured manually using a Shin-Nippon LM-10 manual focimeter.

Results:

The Mean Spherical Equivalent (MSE) between the two pairs of Alvarez lenses was not significantly correlated in both eyes (RE, r2 = 0.21, p>0.05; LE, r2 = 0.02, p>0.05). The mean difference (±SD) between the MSE in the two spectacles was 0.08D ±2.03D in the RE and 0.30D ±2.74D in the LE. LogMAR VA measured with the Alvarez pairs was not significantly correlated in both eyes (RE, r2 = 0.05, p>0.05; LE, r2 = 0.01, p>0.05). The mean difference (±SD) between the two pairs was -0.01± 0.24 in the right eye and -0.02 ± 0.34 in the left eye.

Conclusion:

There was a large variability in the endpoint MSE refractive error and LogMAR VA between the two Alvarez pairs. This suggests that patients have difficulty adjusting the Alvarez spectacles to an accurate and repeatable level of refraction and VA.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Influence of Chromatic Aberration on Vision Quality

Gatis Ikaunieks[1]

Natalija Mickevica[1]

Gunta Krumina[1]

[1]Department of Optometry and vision science, faculty of Physics and mathematics, University of Latvia

Abstract:

Purpose:

One of ophthalmic lens parameters which can influence vision quality is chromatic aberration. Amount of chromatic aberration is mainly related with refractive index and optical power of the lens, however individual sensitivity to this type of aberrations could be different. Aim of this study was to assess effect of induced transverse chromatic aberration (TCA) on vision quality of spectacle wearers.

Method:

For TCA measurements computer program based on subjective Vernier alignment method was used. In this method vertical line is showed on the computer screen. Part of line is located on red and other part on blue background. With induced TCA subject will perceive misaligned line. Subjects task were to shift one part of line to the right or left till all vertical line appeared unbroken and perfectly aligned. In this way amount of TCA was assessed. Prisms with power 5, 10 and 15Δ were used. Measurements were done with base-in and base-out prisms. The same power vertical prisms were used for control measurements. Test distance was 2.6m. Visual acuity was assessed with each prism power. 15 subjects (age 20-30 years) participated in this research.

Results:

As expected, horizontal prisms increased TCA values for all participants. Average TCA values with 5, 10 and 15Δ base-in prisms were 1.37±0.20, 2.46±0.32 and 3.76±0.53 arcmin, respectively. These values were smaller comparing with theoretically calculated values. Results with base-out and base-in prisms were not statistically different ($p>0.05$, paired t-test). There was significant reduction of visual acuity at larger TCA values. In average each added prism reduced visual acuity by ~0.01 logMAR units. Between subjects variance of visual acuity values become larger with increase in prisms power ($p<0.05$, Bartlett\'s test).

Conclusion:

Due to individual variances in visual acuity results with induced TCA we can conclude that minimal amount of TCA, which starts to reduce vision quality, for each subject could be significantly different.

Blue Light Lenses: Spectral Characteristics

Zoran Mijatovic[1]

Livija Temunovic[1]

[1]University of Novi Sad, Department of Physics, Faculty of Sciences

Abstract:

Purpose:

The purpose of this research is checking the spectral characteristics of commercial blue light lenses used in optical practice.

Methods:

The lenses of two top lens commercial producers were tested (call them L1 and L2). The standard spectroscopic methods were applied. Spectral characteristics were recorded in UV and visible spectrum. For this purpose, high resolution spectrometer was used for recordings in visible and 1 nm resolution spectrometer was used in UV part of spectrum. As a source of visible light white LED was used because its emission spectrum is close to the spectrum emitted from LCD and LED screens (when they emit "white"). The source for UV radiation the Sun\'s UV simulator was used. Results are presented graphically over the 350-700 nm spectral range.

Results:

Obtained results show the effect of blocking blue light using the "blue light lenses. Comparison of obtained spectral characteristics of "blue light lenses" with characteristics of "ordinary" lenses without "blue light blocker" was done. Results obtained for two branded lenses, L1 and L2, differ in the blue part of the spectrum. Lenses L1 absorbs about 10 % in the spectral interval 430-480 nm, uniformly. Lenses L2 absorbs radiation below 500 nm, so at 450 nm absorption is 30 %, while at 430 nm is 35 %. The difference in absorption characteristics of L1 and L2 leads to different color vision. White surface seen through L1 lenses has little yellow color, while through L2 the surface gets noticeable more yellow.

In UV range, both lenses block radiation below 350 nm.

Conclusion:

Our analysis shows that "blue light lenses" have the same spectral characteristics as "ordinary lenses" above 500 nm, while in "blue region" absorb between 10% and 30 % of incident light. All tested lenses absorb almost all radiation in UV spectral range. Higher absorption in blue part of the spectrum influences subjective impression of color vision.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Does the Type Of A Task Alter how we Blink? - Explorative Study About Spontaneous Blinking of Ocular Healthy Participants with Auditory, Tactile and Visual Stimulation

Daniela Oehring[1]

Stürzbecher Laura[2]

Meyer Björn[2]

[1]Faculty of Health & Human Sciences, Plymouth University, Plymouth, United Kingdom

[2]Faculty of Electrical- Mechatronic- Optometry Engineer,

Beuth Hochschule für Technik, Berlin, Germany

Abstract:

Blinking behaviour is altered by the level of concentration during a task; but also, to maintain a healthy ocular surface. New research suggests that the brain falls into a micro-sleep during blinking. Thus, it is assumed that the decrease in blinking while concentrating is mainly driven by avoiding this cognitive relaxation. The study aimed to explore spontaneous blinking of healthy adults with auditory, tactile and visual stimulation. The study hypothesis was that the distribution of the characteristics of a blinking change with the type of stimulation and the level of concentration.

Spontaneous blinking was assessed in 10 subjects (60% female; aged (29±6)years). High and low-contrast grading patterns were used for visual stimulation, frequencies between 125Hz and 2000Hz for auditive and Brail-like patterns for tactile stimulation. High-speed cameras were facilitated to capture the blinking. Time domain blinking was recorded from the respective movies. To characterise blinking, the blink rate (BR; n/min), inter-blink interval (II; sec) and the duration of a blink (D; sec) were used. Descriptive analysis and Spearman's correlation coefficient, as well as RM-one-way ANOVA, were used to analyse the results.

The vast majority of subjects (n>8) characterised the auditory stimulation to be the easiest task (lowest difficulty), followed by high and low contrast; tactile stimulation was found to be the most difficult task. Significant differences between difficulty levels were found for the BR and II ($p< 0.1$): lower BR was found for highest difficulty level and vice versa. II showed that for the highly difficult tasks the II was longest and for low difficulties, the II was shortest. Strong association could be detected between the level of concentration and blinking characteristics (BR $r=-0.421$, $p=0.007$; II $r=0.312$, $p=0.049$; D $r=-0.033$, $p=0.840$).

The study provides inside into the underlying mechanisms of blinking and the relation to cognitive stimulations and also the individual level of concentration difficulty. It can, therefore, be assumed that the neural processing is beyond the blinking function to preserve the tear film quality.

Good Optician Prevents Spinal Abnormalities

Abed El-Qadir Watad

Roayah Optometry Clinic & Vision Care

Abstract:

Clinical topic:

Allocation of differential prisms is too important, because you are not affecting only the eye movements and the binocular vision, you are also affecting the whole body orientation. In this case study we will focus on the relation between the allocations of the differential vertical prisms on the spine abnormalities.

Case presentation:

28 Y.O male healthy in general, wearing spectacles since childhood, stable prescription from 3 years:

RE:-3.75/-1.50x135 VA 6/6, LE:-5.75/-2.00x35 VA 6/6

BUT the same problem since 3 years, although the visual acuity is 6/6 monocular and binocular our patient still complaining that any object especially at night is hazy and unstable with halos around and headaches with tiredness at the end of almost every day.

Actions taken:

Subjective refraction:

RE: -3.75/-1.50x135 VA: 6/6, LE: -5.75/-2.00x36 VA: 6/6

Cover test: 8 B.UP LE

Allocation of prisms was the most important part, so that we had decided to prepare 3 pairs of spectacles:

1) 8 Base Up Left Eye
2) 8 Base Down Right Eye
3) 4 Base up left eye and 4 Base down right eye

Conclusion:

After the relevant measurements and considerations about spine abnormalities that we may cause. The measurements of the angles between the C1- T1 (some literature argues that the ideal value is 42 degrees) can explain the best choice of the allocation of the prisms. We had decide to take the third option: (4 Base up left eye and 4 Base down right eye) in order to keep the Spine in normal position.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Doesthe Design of Progressive Soft Contact Lenses Allow Achieving a Peripheral Retinal Defocus Comparable with the one Obtained After Orthokeratology Treatment?

Alessandro Fossetti[1]

Giuseppe Saija[1]

Irene Martorelli[1]

Erisiola Vallaj[1]

[1]Institute for Research and Studies in Optics and Optometry (I.R.S.O.O.) VINCI, ITALY 2)
University of Florence, FLORENCE, ITALY

Abstract:

Purpose:

The control of myopic progression obtained by overnight orthokeratology has been related to the relative myopic peripheral refraction caused by the treatment. The aim of this study was to compare the peripheral refraction across the horizontal meridian in myopic subjects wearing center-distance multifocal soft contact lenses with different additions, in order to evaluate which peripheral refractive profile is closer to the one obtained by overnight orthokeratology.

Methods:

Six students of an optometry course with refractive errors between -2.00 D and -5.00 D in spherical component and up to 1.00 D of astigmatism, were enrolled in a one- month orthokeratology (OK) treatment. Measurements of central and peripheral refraction were taken, under different refractive conditions, with an open-field Grand Seiko Auto-Refractometer in 10 degree steps; up to 30 degree along the horizontal meridian both in the nasal and temporal retina. The measurements were taken just before the orthokeratology treatment, under different refractive conditions: (a)unaided, (b) with glasses, (c) with single vision soft contact lenses (SVSCL), (d) with center-distance multifocal soft contact lenses (CD-MSCLs) of three different additions (+2.00D, + 2.50D, +3.00D). After one month of orthokeratology treatment measurements of central and peripheral refraction were taken in unaided condition.

Results:

The sphero-cylindrical refraction values were converted to the power vector notation for analysis. The profiles of central and peripheral refraction along the horizontal visual field (from 30 degree nasal to 30 degree temporal) were drawn on a diagram and compared. CD-MSCLs with additions up to 3.50 D produced a significant negative peripheral refraction, which in any case did not reach the myopic defocus values obtained with the OK treatment.

Conclusion:

If the control of myopia progression in orthokeratology can be attributed to the relative peripheral myopic defocus, one could think that the same results can be achieved with a CD-SCL mimicking the same profile of the retinal defocus present after OK. Yet, this work shows that CD-SCLs can achieve the same refractive profile as OK only in the case of additions above 3.5D.

Peripheral Refraction Induced by Fractal Contact Lenses (Fcls) in Myopic Eyes

Walter D. Furlan[1]

Manuel Rodriguez-Vallejo[2]

Diego Montagud[3]

Juan A. Monsoriu[3]

[1]Departamento de Óptica, Universitat de València, 46100 Burjassot, Spain

[2]Department of Ophthalmology (Qvision), Vithas Virgen del Mar Hospital, 04120, Almería, Spain

[3]2Centro de Tecnologías Físicas, Universitat Politècnica de València, 46022 Valencia, Spain

Abstract:

Purpose:

To assess the peripheral refraction induced by Fractal Contact Lenses (FCLs) in myopic eyes by means of a two-dimensional Relative Peripheral Refractive Error (RPRE) map.

Methods:

This study involved twenty-five myopic subjects ranging from -0.50 D to -7.00 D. FCLs prototypes were custom-manufactured and characterized. Two-dimensional RPREs were measured with an open-field autorefractor at 67 points, covering the central 60 x 30 degrees of the visual field. The bidimensional RPRE vector components: M, J0, and J45 of the difference between the values obtained with and without the FCLs in the eye were obtained.

Results:

Peripheral refraction measured with the FCL, shows a noticeable myopic shift for the spherical equivalent defocus (M) and for the astigmatic J0 components, J45 remained constant along the horizontal axis, but in eccentric oblique positions was clearly more negative with LCF, than without LCF. RPREs with FCLs were statistically significant more myopic ($p < 0.05$) than without lenses in the peripheral visual field from 10º to the periphery.

Conclusion:

FCL design produces a myopic relative peripheral shift in myopic eyes in the whole 2D visual field. This result suggests that FCLs could be an effective treatment to slow myopia progression.

„Psychopharmacotherapy And Dry Eye Syndrome“

Ivana Bakija[1], Snježana Kaštelan[2], Marija Bogadi[3]

Kristijan Pili[4], Igor Filipčić[1]

[1]Psychiatry Hospital „Sveti Ivan“, Department of Integrative psychiatry
[2]Clinical Hospital Dubrava, Department for ophthalmology
[3]Psychiatry Hospital for children and adolescents
[4]University of Applied Sciences Velika Gorica

Abstract:

Introduction:

Dry eye syndrome (DES) is one of the most common ocular morbidities and often results in significant eye discomfort, visual disturbances and potential damage to the corneal surface. It is a known fact that some drugs used in psychiatry may cause ocular drying through reduction of tear film production. The aim of this presentation was to determine dry eye findings in patients who take psychiatric medications.

Discussion:

DES is a well-recognized adverse side effect of many topical and systemic medications including psychiatric drugs. In psychiatry, patients with depression, schizophrenia and other psychotic disorders, posttraumatic stress disorders (PTSD) or bipolar disorders who are taking antidepressants, antipsychotics, lithium carbonate and sodium valproate frequently experience DES as a side effect. DES is common in patients with depressive and anxiety disorders, especially in those who experience longer durations of psychiatric disorder and use selective serotonin reuptake inhibitors (SSRIs) particularly in the elderly. Studies show that both SSRIs and serotonin-norepinephrine reuptake inhibitors increased the risk for eye dryness. One of the possible mechanisms could be the effect of administered drugs on the parasympathetic innervations of tear glands. The lower Schirmer test results of the SSRIs may be additionally associated with mechanisms other than the anticolinergic system. There is an increasing awareness that incidence of ocular side effects rises rapidly with the use of polypharmacy that is very often seen in psychiatric patients and thus this fact should not be neglected.

Conclusion:

Psychiatrists, ophthalmologists and patients need to be aware and prepared for possible medication-induced adverse effect such as dry eye during the psychiatric treatment. In order to reduce the incidence of side effects of applied medications clinicians should try to use the lowest possible dose to achieve the desired therapeutic effect. Further studies regarding the potential mechanisms of psychiatric medications on the tear film function as well as ocular surface alteration are needed.

Uveal Melanoma: Management and Prognosis

Snježana Kaštelan[1], Antonela Gverović Antunica[2], Ivana Bakija[3]

Marija Bogadi[3], Kristijan Pili[4], Ema Kasun[5]

[1]Clinical Hospital Dubrava, Department of Ophtalmology, Zagreb, Croatia

[2]General Hospital Dubrovnik, Department of Ophthalmology, Dubrovnik, Croatia

[3]Psychiatry Hospital „Sveti Ivan", Department of Integrative psychiatry, Zagreb, Croatia

[4]University of Applied Sciences Velika Gorica, Velika Gorica, Croatia

[5]University of Zagreb, School of medicine, Zagreb, Croatia

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Abstract:

Educational topic: Uveal melanoma is the most common primary intraocular malignancy in adults and the eye is the second most common site for primary melanoma after the skin. Early recognition is important in protecting visual acuity, saving the eye and preventing metastasis.

Discussion:

Signs for early detection of uveal melanoma when it simulates a nevus include thickness >2 mm, presence of subretinal fluid, symptoms, orange pigment, margin of the tumour near the optic disc, acoustic hollowness, surrounding halo, and the absence of drusen. This is essential considering that each millimetre increase in melanoma thickness imparts a 5% increased risk for metastatic disease. Delays or inability to make an accurate and early diagnosis may have grave consequences. Methods of diagnosis have substantially improved, although clinical diagnosis remains the standard method in the eyes with clear media. In eyes with opaque media ultrasound is the most useful ancillary diagnostic technique. Newer imaging modalities such as optical coherence tomography and fundus autoflouroscence facilitate in detection of subretinal fluid and orange pigment. Additional molecular biomarkers and cytological features which can predict the clinical behaviour of a small melanocytic lesion have been identified. Advances in the diagnosis and local and systemic treatment of uveal melanoma in recent times have caused a shift from enucleation to eye-conserving treatment modalities. Currently irradiation is the most common therapeutic choice with plaque brachytherapy being the most frequently used form. Other techniques include charged-particle radiotherapy, proton beam therapy and surgery. With a primary tumour, local treatment methods are effective at preventing local recurrence in over 95% of cases. However, they have no impact on the risk of metastatic disease, which develops in up to 50% of patients with spread of the tumour cells most commonly to the liver. Although potential therapeutic targets have been identified there is currently no effective treatment of metastatic disease with systemic therapy and chemotherapy generally being ineffective.

Conclusion:

Pending clinical trials involving chemotherapeutic, immunotherapeutic and molecularly targeted agents offer hope for successful tumour control and vision preservation as well as metastases prevention and improvement of overall uveal melanoma patient survival.

Visual Function In Multiple Sclerosis

Snježana Kaštelan[1], Antonela Gverović Antunica[2], Ines Lazibat[1]

Ivana Bakija[3], Marija Bogadi[3], Kristijan Pili[4], Ema Kasun[5]

[1]Clinical Hospital Dubrava, Department of Ophtalmology, Zagreb, Croatia
[2]General Hospital Dubrovnik, Department of Ophthalmology, Dubrovnik, Croatia
[3]Psychiatry Hospital „Sveti Ivan", Department of Integrative psychiatry, Zagreb, Croatia
[4]University of Applied Sciences Velika Gorica, Velika Gorica, Croatia
[5]University of Zagreb, School of medicine, Zagreb, Croatia

Abstract:

Educational topic:

Visual impairment which is most often caused by acute optic neuritis (ON) is one of the important symptoms of multiple sclerosis (MS). Although ON is very common, even in 20% of cases presenting manifestation of MS, visual deficits and structural loss of neural axons can occur in asymptomatic eyes.

Discussion:

Awareness of visual dysfunction in MS is increasing partially due to the development of sensitive visual function tests, structural markers such as optical coherence tomography (OCT) and quality of life (QOL) assessment which enable us to verify correlations between clinical symptoms and signs to the structural and functional changes of the afferent visual pathway. OCT enables high-resolution reconstructions of retinal anatomy and allows detailed analysis of the retinal nerve fiber layer (RNFL) as well as ganglion cells. Axonal and neuronal degeneration are important features of MS and OCT assessment allows quantification of ganglion cell and neuronal layer loss and axonal degeneration in MS in vivo making the anterior visual pathway and acute ON valuable models for testing novel agents for neuroprotection and repair. New therapies that reduce axonal loss by neuroprotective or myelin repair mechanisms can now be assessed non-invasively by OCT and linked with visual function data. Longitudinal studies with OCT monitoring have shown RNFL axonal loss over time that occurs even in the absence of acute ON and is associated with clinically important worsening of vision and QOL, even in patients with benign MS.

Conclusion:

Ophthalmological assessment and new diagnostic methods such as OCT will improve our understanding the mechanisms of brain tissue damage in MS and thus emphasize the importance of visual function as a model for evaluation in medical practice and clinical trials in MS.

Multidisciplinary Approach to the Patients with Neurofibromatosis Type I – a Case Report

Marija Bogadi[1], Snježana Kaštelan[2], Ivana Bakija[3]

Kristijan Pili[4], Boris Kasun[5]

[1]Psychiatric Hospital for children and adolescents

[2]Department of Ophthalmology, University Hospital Dubrava

[3]Psychiatric Hospital "Sv. Ivan",

[4]University of Applied Sciences Velika Gorica

[5]Special Hospital for Medical Rehabilitation Stubičke Toplice

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Abstract:

Clinical topic:

This case report stresses the importance of a multidisciplinary approach to the treatment of an eight year old boy with a rare oncological disease - neurofibromatosis type I.

Case presentation:

Neurofibromatosis is a multisystem genetic disorder that is characterized by cutaneous pigmentation, skeletal dysplasia, the growth of benign and malignant nervous system tumours, most notably benign neurofibromas as well as changes in the eye. The incidence of the disease is 1:3000-4000 live-born children. It may be accompanied by mental retardation with learning disorder; Attention Deficit and Hyperactivity Disorder (ADHD) in addition to prominent motor activity and disability. Children faced with the severity of this malignant illness display diverse emotional reactions, with physical responses and various behavioural changes. This may also cause changes in cognitive functioning, often leading to low achievement at school and diminished self-confidence.

We present a case of an eight year old boy with behavioural and learning disabilities referred for psychological and psychiatric evaluation.

Treatment of children with neurofibromatosis requires a multidisciplinary approach with cooperation of various medical professionals, educationalists and parents. Of particular importance is the psychological, ophthalmological and speech therapist assessment by which the most appropriate form of education is determined depending on the degree of intellectual disability and the presence of other accompanying symptoms of the disease.

Action taken:

Upon evaluation the appropriate form of education was determined including ophthalmological assessment, speech therapy, special education, psychiatric treatment, counselling and support to parents with the aim of reducing psychomotor disorder, visual disability and assistance in learning and thereby reducing frustration and improving self-esteem.

Conclusion:

The aim of this paper was to emphasize the importance of team work with a multidisciplinary approach in the treatment of complex hereditary diseases without underestimating the important role of ophthalmologist and psychiatrists.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

Effect of Position of Gaze on Accommodation and Vergence

Paolo Tacconella[1]

Giovanni Grassi[2]

Caricato Anna Paola[3]

Palma Monica[4]

1VisivaMente, association for visual neurosciences, Italy
2CdL Ottica e Optometria, Università del Salento, Italy
3Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, Italy
4Dipartimento di Scienze dell'Economia, Università del Salento, Italy

Abstract:

Purpose:

near visual activities (20-50 cm) are rarely conducted in primary position of gaze (straight ahead), regardless of the age of the subjects. Nevertheless, research has paid little attention to the observation of functional visual profiles in secondary positions of gaze. In particular, the downward position is more ecological and potentially more informative than the actual functional profile of the subject. The aim of this study is to examine the possible effects of position of gaze on accommodation and vergence responses in order to assess their clinical importance, especially in the perspective of increasing the external validity of the visual tests and ensuring greater predictability of the data measured in the optometric practice.

Methods:

A group of young adult subjects (N = 100; mean age: 29; range 20-39; F50%) without significative visual symptomatology (C.I.S.S. = 10,52: s.d. 4,69) were enrolled in the study. Measurements of phoria, accommodative and vergence accuracy, accommodative and vergence amplitude, gradient AC/A ratio and local stereopsis performed in primary and secondary (30° downward) position of gaze were compared. The data were analyzed by evaluating the strength of the relationship between the two series of data (Spearman\'s rho) and the level of agreement between them (Wilcoxon test).

Results:

The analysis highlights a significant positive high correlation (the rho index varies from 0.73 to 0.87) for most variables. Nonetheless, the level of agreement (Wilcoxon) between them is significantly low (p-value <0.05) for accommodative (0.000) and vergence amplitude (0.000), nearpoint phoria (0.000) and local stereopsis (0.006). An interchangeability of data was found for accommodative (0.869) and vergence accuracy (0.259) and gradient AC/A ratio (pos: 0.098; neg: 0.270).

Conclusion:

The position of gaze produces significant changes in accommodation and vergence amplitude (N.P.C. and A.A.) but not accuracy (M.E.M. and Fix. Disp.). Furthermore phoria and stereopsis have shown to change in downward gaze, unlike AC/A ratio. Since these test are routinely used to diagnose visual conditions it is recommended to consider the downward position of gaze to better understand the patient's visual functional profile.

Dry eye assessment - comparison of questionnaires and objective tests

Marko Toth[1]

Sonja Drugović[1]

[1]University of Applied Sciences Velika Gorica, Croatia

Abstract:

Purpose:

The aim of this research was to examine metric characteristics of several dry eye questionnaires and to compare them with some objective measured parameters of dry eye.

Methods:

The data was collected from 115 Croatian students of several study programs who voluntarily participated in the survey. Participants were informed about the procedure and possible risks and subsequently they completed the several most commonly used questionnaires in diagnostical practice: McMonnies Dry Eye Questionnaire (MDEQ), Standard Patient Evaluation of Eye Dryness (SPEED) and Ocular Surface Disease Index (OSDI), while their socio-demographic data were likewise collected. After the participants completed the questionnaires, they proceeded to the subsequent survey stage in an optometric laboratory for the vision and dry eye examination. Licensed optometrists assessed several objective measures of dry eye: Tear Film Break-up Time (TBUT) and Tear Meniscus Height (TMH) examined at the Essilor slit lamp and Non-invasive Keratograph Break-up Time (NIKBUT) assessed using the Oculus Keratograph 4.

Results:

The correlations between all measures used and their indicators of metric validity were computed. The results showed no correlations between subjective and objective measures and acceptable metric characteristics of the questionnaires used in the survey.

Conclusion:

Since the correlations there are no correlations between the used subjective and objective measures of dry eye and the questionnaire-type measures show acceptable metric features, it is recommended to use both in the diagnostical procedures of determining the dry eye disease.

PULA2018
Optometry and Optics for Better Vision
11-13 May CROATIA

The Paradox of Choosing and Buying Prescription Glasses

Anica Hunjet[2]

Edita Vučaj[1]

Dijana Vuković[2]

[1] OPTIFAB, Varaždin, Croatia,

[2] University North, Croatia

Abstract:

Purpose:

The fact that the market for dioptric glasses today is increasing has become unquestionable. However, because of the increasing number of luxury glasses manufacturers and the increasing diversification of sunglasses, it is no longer enough to be aware of this fact, but complex strategies for segmentation, targeting and positioning of dioptric lenses on the market are necessary.

Methods:

This paper explores the relationship between consumer behaviour in the choice of dioptric glasses, their motives and factors that influence the choice of glasses and the identification of those factors that lead to the paradox of dioptric spectacle selection. Research on a deliberate sample of 250 respondents will be conducted, using a structured questionnaire. This questionnaire will consist of three units: the motives and factors of consumer behaviour that are crucial to the buying process, evaluating the criteria on the basis of which the consumer selects dioptric eyeglasses and the factors that lead to a paradox of choice, regardless of the motive of the selection.

Results:

It has been proven, on the basis of the research carried out, that when purchasing diopter reading glasses, regardless of the purchasing motive, there is a paradox of choice which indicates the very large number of available reading glasses options.

Conclusion:

Such a large selection of reading glasses confuses consumers and makes the choice more difficult, so the conclusion could be made that the choice of reading glasses, besides the functional properties, depends very much on the lifestyle, the picture of oneself, the role in the society, quality, brand and influences the decision-buying process.

Relation of Precision and Visual Acuity of Children of Younger School Age

Livija Temunović

University of Novi Sad, Faculty of Sciences, Department of Physics, Novi Sad, Vojvodina;

Hoya - MobiOptika, Beograd, Serbia

Abstracts:

Purpose:

This study points to the most commonly occurring defects in children, the discovering them, and their influence on the specific motor activity in which there is good vision, and therefore the binocular vision is crucial.

Methods:

The research was conducted on 37 subjects checking their motor skills: 1) Assessment of precision, throwing the ball in the vertical goal; 2) Throwing the ball into the horizontal goal; 3) Rolling the ball into the target. Tests for the assessment of precision as motor abilities in children of the younger school age in this study were done independently and applied in a preliminary manner. After the motor tests were performed, the visual acuity of the children, the field of vision, the binocular vision, and the color test (Ishihara) were tested. The testing was completely adapted to the children`s game world and imagination. On the other hand, the conceptual solution is fully approximated to the children`s game and imagination word.

Results:

The following statistical operations were performed on the results of the mesurement: data compression, determination of significance, of relations, and factor validity

Conclusion:

The accent is placed at the age of 6-7 years becouse this is the upper limit for possible corrections and enhancements in visual acuity in children

Comparing Testing in Series to Testing in Parallel

Jonathan Shapiro

Abstract:

Routine refraction examination is often taught as a series of steps and students continue this practice throughout their careers. Since the visual system is holistic, and testing in series can miss important factors, it is advantageous to teach and implement binocular balancing in parallel. The development of the technique and the related instrument was published.

Shapiro IJ, (1995). Parallel-Testing Infinity Balance. Instrument and Technique for the Parallel Testing of Binocular Vision. Optom Vis Sci 1995:72:916-923.

Shapiro IJ,(1996) Testing Binocular Vision Using a Chart and Optical Septum, British Patent Specification No.2281634, 10 April 1996

Testing in Series. Clinical tests performed one after the other. Each parameter is measured and corrected and assumed to remain fixed afterward.

Testing in Parallel. Clinical test performed in such a way that different parameters are examined simultaneously. The effect of one parameter on another can be noticed and the final results appropriately altered. Examples: Parallel-Testing Infinity Balance test; Parallel-Testing Near Balance test; Turville Infinity Balance test. (Millodot: Dictionary of Optometry and Visual Science, 7th edition. © 2009 Butterworth-Heinemann)

Content:

The lecture will explain the principle differences between testing in series and testing in parallel. The instruments will be described, and the techniques used will be elaborated on.

The examination techniques are divided into different sections.

Facility and stability of the binocular system as determined by the position of the perceived images in the visual space.

The refractive prescription.

Perceptual differences between the two eyes.

Miscellaneous uses.

Recommendations/Conclusion:

The visual demands on people in the present environment necessitate a higher level of accuracy in prescribing and dispensing. The techniques described can raise the level of services provided by optometrists. The training in refraction of optometrists should be improved to include these techniques.

Please note that the lecture is linked to the workshop proposal, where demonstration and practice of parallel testing will be given.

Powered by

VELEUČILIŠTE VELIKA GORICA
UNIVERSITY of APPLIED SCIENCES VELIKA GORICA

European Academy
of Optometry and Optics