

HELSINKI2021 23-25 APRIL

Vision for the future: forum for optometry and optics

ABSTRACT BOOK



European Academy
of Optometry and Optics

Abstracts of the annual conference of the European Academy of Optometry and Optics 2021 HELSINKI2021 23-24-25 April 2021 Helsinki, Finland / online

EAOO HELSINKI2020 is co-organized by the European Academy of Optometry and Optics (EAOO) and the Finnish Association of Vision and Eyecare (NÄE ry).

This abstract book (v 15 April) is for consultation purposes only. It contains abstracts that have been accepted as part of the conference programme. Please note that abstracts are listed in numerical order, after their ID number.

Note to authors: Inclusion of your abstract in this version does not represent proof of attendance at the conference. At the end of the conference, you will receive a certificate of participation and proof of presentation.

Disclaimer: This abstract volume has been produced using author-supplied copy. Editing has been restricted to some corrections of spelling and style where appropriate. No responsibility is assumed for any claims, instructions, or methods contained in the abstracts.

OVERALL VIEW.....	3
OPEN PAPER SESSIONS.....	3
POSTER PRESENTATIONS.....	5
ABSTRACTS	6
ABSTRACTS ACCEPTED FOR ORAL PRESENTATIONS	6
ABSTRACTS ACCEPTED FOR POSTER PRESENTATIONS.....	48

OPEN PAPER SESSIONS

Friday, 23 April, 14:30-15:30, room Sibelius SESSION 1: EDUCATIONAL TOPICS		
ID	ABSTRACT TITLE	Presenter
382	Is there a difference in learning styles between optometry students undertaking a blended learning course compared to those on a face to face full-time course?	Rupal Lovell-Patel
370	Optometry-related mini-project promoting collaborative learning and social interaction across student cohorts	Ellen Svarverud
356	Clinical reasoning via Collaborative Online International Learning	Ariela Gordon-Shaag
332	Discovering student motivations for optometry as a career	Paul Murphy
Friday, 23 April, 14:30-15:30, room Uspenski SESSION 2: AMBLYOPIA		
ID	ABSTRACT TITLE	Presenter
310	Virtual Reality clinically applied	Steen Aalberg
296	Effect of specialized applications on the visual functions of amblyopic eye	Kristine Kalnica-Dorosenko
352	Thickness of the different layers of the retina in patients with anisometropic, strabismus and deprivation amblyopia.	Ana Diaz Cortes
Friday, 23 April, 16:30-17:30, room Sibelius SESSION 3: Anterior Eye		
ID	ABSTRACT TITLE	Presenter
315	Longitudinal Assessment of Ocular and Corneal Aberrations in Children wearing Dual-Focus Multifocal Contact Lenses	Daniela Lopes-Ferreira
328	Accommodation response in various design soft contact lenses wearers	Evita Kassaliete
320	Nutrition and Dry Eyes	Jeffrey Weaver
Friday, 23 April, 17:30-18:30, room Sibelius SESSION 4: OPTICAL		
ID	ABSTRACT TITLE	Presenter
363	Effectiveness of customized PRLoop lenses in patients with correlated objective (microperimetry) and subjective PRL.	Michele Jurilli
287	Effect of Blue-light Protection on the Eye →Facts and Myths!!	David Berkow
383	Advanced Vision Accuracy (AVA): from new refracting method to new ophthalmic lens solution to facilitate prescription in increments of 0,01 D.	Gildas Marin
Saturday, 24 April, 10:00 - 11:00, room Sibelius SESSION 5		
ID	ABSTRACT TITLE	Presenter
322	Clinical Determination of Light Discomfort. Evaluation of a New Clinical Device for the Quantification of Discomfort Thresholds.	Alejandro Cervino
358	Light distortion and contrast sensitivity function in pseudophakic population implanted with monofocal and multifocal IOLs	Santiago Escandon-García
339	Colour vision sensitivity changes one week after cataract removal surgery	Zane Jansone-Langina
333	Reading Visual Acuity vs Reading Speed in Spanish Elder Population	Juan Carlos Ondategui Parra

Saturday, 24 April, 11:30 - 13:00, room Sibelius SESSION 6: DRY EYE		
ID	ABSTRACT TITLE	Presenter
342	Inter and intra-observer reliability in assessing tear meniscus height in different positions by a new digital device	Fabrizio Zeri
350	Ocular Surface Complications from Eyelash Obsessions	Bridgitte Shen Lee
357	Role of eye care professionals in the field of visual functioning and dry eye	Mirjam van Tilborg
Saturday, 24 April, 15:00 - 16:00, room Sibelius SESSION 7		
ID	ABSTRACT TITLE	Presenter
343	Effect of optometric office size on the assessment of subjective refraction and visual acuity	Aiga Svede
298	Visual acuity measurements by ETDRS protocol	Arto Hartikainen
378	Dichoptic training of binocular vision in amblyopia: a series of cases using a virtual reality system	Sotiris Plainis
Saturday, 24 April, 16:30 - 18:00, room Sibelius SESSION 8		
ID	ABSTRACT TITLE	Presenter
353	Communication between community optometrists and hospitals: too much variation?	Rakhee Shah
325	Are children part of the community served by community optometrists?	Salma Ahmad
379	Evaluating eye-fixation based reading performance in presbyopia correction with contact lenses	Sotiris Plainis
Sunday, 25 April, 09:00 - 10:00, room Sibelius SESSION 9: EDUCATIONAL TOPICS		
ID	ABSTRACT TITLE	Presenter
313	Bridging the Gap: From Classroom to Clinic	Dinah Paritzky
326	Understanding issues around supporting and promoting success for students from non-traditional routes: the transition from a foundation programme to BSc Optometry	Irene Ctori
286	Let's talk about visual impairment- using personal patient stories in Optometry/Ophthalmic dispensing education	Ahalya Subramanian
Sunday, 25 April, 10:00 - 11:00, room Sibelius SESSION 10: BINOCULAR VISION		
ID	ABSTRACT TITLE	Presenter
288	How the skull structure affects the development and functioning of the binocular vision and cortical integration.	Jonathan Shapiro
302	Accommodative performance improves when hyperopia is corrected during sustained near viewing tasks	Julie-Anne Little
354	Visual Perceptual Testing for the Optometrist	Christine Allison
Sunday, 25 April, 10:00 - 11:00, room Uspenski SESSION 11		
ID	ABSTRACT TITLE	Presenter
351	Specific topographic pattern of first-degree relatives of patient presenting with Keratoconus	Einat Shneor
317	Acceptability of a home-based visual field test (Eyecatcher) for glaucoma home monitoring: A qualitative study of patients' views and experiences.	Tamsin Callaghan
365	Portuguese Program to Prevention of Diabetic Retinopathy (Systematic Diagnosis and Treatment of Diabetic Retinopathy)	Eduardo Teixeira
329	Enhancing Patient Care with Directed Symptom Surveys	Bennett McAllister

POSTER PRESENTATIONS

Poster presentations		
ID	Title	Presenter
282	Digital Amsler grid and its usage in practice of optometrist	Petr Vesely
284	Economic inequality in unmet refractive errors need in deprived rural population of Iran: Oaxaca-Blinder decomposition	Abbas Ali Yekta
285	Comparison of the early changes of corneal biomechanical properties after photorefractive keratectomy and small incision lenticule extraction	Abbas Ali Yekta
289	Provision of vision care in under-developed environments.	Jonathan Shapiro
297	Hybrid contact lenses in high astigmatism correction	Pavel Benes
300	Measuring Corneal Touch Sensitivity	Matjaz Mihelcic
306	Influence of the blue light blocking lenses on the retinal straylight	Gatis Ikaunieks
307	Clinical Competency Outcomes of Patient-Centered Supplemental Education for Finnish Students Studying in the United States	Robert Andersson
309	Comparison of two methods for measuring visual acuity at different distances	Laura Clavé
318	The Development of Anaglyph Global Method for Determination of Stereoanomaly	Gunta Krumina
319	Divergence Insufficiency: Even more elusive if we don't look.	Jeffrey Weaver
347	In vitro study of surface temperature changes in soft contact lenses undergoing forced heating	Paul Murphy
359	Corneal topography in assessing Extended Depth of Focus CL centration	Fabrizio Zeri
360	Visual performance, effect of glare and binocular summation with monofocal, edof and trifocal toric IOLs: pilot study.	Santiago Escandon-Garcia
377	Exciting changes in visual field testing	Ben Backus

ABSTRACTS ACCEPTED FOR ORAL PRESENTATIONS

ID: 00286

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

AHALYA SUBRAMANIAN¹

Affiliation:

1) Division of Optometry and Visual Science, City, Univesrity of London, London UK

Presenter: Ahalya Subramanian

LET'S TALK ABOUT VISUAL IMPAIRMENT- USING PERSONAL PATIENT STORIES IN OPTOMETRY/OPHTHALMIC DISPENSING EDUCATION

Key words: Personal patient stories, Visual Impairment

Summary:

Patients are increasingly being used in medical schools for the design, delivery and evaluation of medical education. Patient involvement is beneficial to students as it can help develop communication skills, empathy and clinical reasoning. Although there is no published information about patient involvement in Optometry/ Ophthalmic dispensing, patients are sometimes used in teaching and assessment. For example, at City, University of London visually impaired patients are used as volunteers in the low vision clinic and during assessments.

Personal patient stories can help students reflect on the experience of disease and have a positive impact on their learning. The aim of this study was to use a personal story from a visually impaired patient to help students gain a better understanding of the impact of visual impairment with particular emphasis on depression and Charles Bonnet Syndrome (CBS).

Content

An experienced visually impaired speaker delivered a 40 minute presentation to a group of final year undergraduate optometry (n=60) and foundation degree in ophthalmic dispensing (n=20) students. The speaker discussed their personal experience of visual impairment and dealing with Charles Bonnet Syndrome and depression. Students were able to ask questions and completed a questionnaire at the end of the session. The questionnaire investigated students understanding about visual impairment and its impact, awareness of the link between depression and visual impairment and Charles Bonnet Syndrome. The questionnaire also examined whether the session improved students' knowledge of these conditions and whether the session was beneficial to the students learning and understanding of visual impairment.

Results

All students across both programmes agreed that using a personal patient story improved their understanding about how visual impairment impacts a person's life including the effects of depression and CBS.

Recommendations/Conclusions

Using personal patient stories can be a valuable learning aid for students. This type of learning can be implemented into the curriculum of other optometry/related disciplines' where these are not currently used.

ID: 00287

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

DAVID BERKOW¹

Affiliation:

1) Berkow Optometrists

Presenter: David Berkow

EFFECT OF BLUE-LIGHT PROTECTION ON THE EYE: FACTS AND MYTHS!

Key words: Blue light; dangers; effective; necessary;

Summary:

Blue light is a colour in the "visible light spectrum" that can be seen by the human eye. It has a wavelength of between approximately 380nm and 500nm.

Studies suggest that, over time, exposure to the blue end of the light spectrum could cause severe long-term damage to the human eye.

The presentation will explain where blue-light is found, the benefits of blue light exposure (e.g. sleep/wake cycle, boost alertness, elevates moods) as well as the harmful effects (digital eye strain, cataracts, AMD, disrupts the sleep/wake cycle, increased risk of depression, etc.).

There are questions which need discussion:

1. Are blue-blocking spectacle lenses effective in improving visual performance?
2. Are blue-blocking spectacle lenses effective in alleviating the symptoms of visual fatigue or discomfort?
3. Are there any structural changes in the macula following the interventions?
4. Are blue-blocking spectacles effective in improving sleeping quality?

The primary question after discussing the above is **whether to prescribe or not to prescribe** blue-light-blocking lenses or filters.

The presentation will show that there is a lack of high-quality clinical evidence proving the beneficial effect of blue-light blocking spectacles in improving visual performance, sleep quality, alleviate eye fatigue or conserve macular health.

It will also describe, in detail, the pros and cons of blue-light protection on the eye.

The question is : Is this purely an issue of increased financial revenue?

This presentation will give an insight into the current opinions and trends in blue-light-blocking lens prescribing.

ID: 00288

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

JONATHAN SHAPIRO¹

Affiliation:

1) Shapiro Optometrist Ltd

Presenter: Jonathan Shapiro

HOW THE SKULL STRUCTURE AFFECTS THE DEVELOPMENT AND FUNCTIONING OF THE BINOCULAR VISION AND CORTICAL INTEGRATION

Key words: Skull structure, Binocular vision

Summary:

The orbits of the eyes, located in the skull, act as the platform for positioning the eyes. The skull-structure of people varies greatly, and is constantly changing as the person develops, even into old age.

On examining the binocular vision, anomalies are often examined limited to the primary position. Mal-position orbits may cause binocular balance problems that are only exhibited during vergences.

The cause of phorias may be linked to abnormal orbital positioning. There may also be an effect from changes in the quality and/or strength of the tension on the ligaments that connect the EOMs to the eyeball, especially as the eyes move. A further cause may be a reduction in the nerve or muscle component. Vision Training, orthoptics, and/or prismatic correction need to consider the cause of the phoria and may not be relevant in cases of orbital location.

The postural adaption, to alleviate stress caused by the mal-positioned orbits, can lead to orthopaedic problems. This lecture looks at common mal-positioned orbits encountered in clinical practice. There will be a description on how they appear; the effect they cause on the binocular vision; the method of investigation; treatment that may be suitable; and the effect on the posture.

ID: 00296

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

KRISTINE KALNICA-DOROSENKO¹, NADEZDA BRUJEVA¹

Affiliation:

1) University of Latvia, Faculty of Physics, Mathematics and Optometry, Department of Optometry and Vision Science

Presenter: Kristine Kalnica-Dorosenko

EFFECT OF SPECIALIZED APPLICATIONS ON THE VISUAL FUNCTIONS OF AMBLYOPIC EYE

Key words: Amblyopia, specialized applications, occlusion therapy, stereovision

Summary:

Purpose

The classical treatment option of amblyopia is occlusions of non-amblyopic eye. The newest methods involve specialized computer and phone games, applications that involve both eyes in visual processing during treatment as well as stimulate binocularity. The aim of the work was to assess the efficiency of specialized phone applications in the treatment of amblyopia in preschool-age children.

Methods

There were 30 participants (5-8 years old): 16 participants had occlusion therapy; 14 participants played the specialized phone application Duovision®. The visual acuity of amblyopic eye, as well as stereopsis was evaluated at near and far distances before the treatment, 2 and 4 months after the treatment.

Results: The results show statistically significant improvement in visual acuity and stereovision in both treatment groups after four months of therapy. The extent of improvement is similar in both groups.

Conclusions

Specialized phone applications for amblyopia treatment may be recommended to patients at any age if they want to improve their visual acuity in the amblyopic eye and are not willing to use occlusions. The only requirement for using specialized applications – patients need to have binocular single vision. In conclusion, the use of specialized phone applications is an alternative type of amblyopia treatment compared to occlusion therapy.

ID: 00298

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

ARTO HARTIKAINEN¹

Affiliation:

1) Mr. Arto Hartikainen, optometrist

Presenter: Arto Hartikainen

VISUAL ACUITY MEASUREMENTS BY ETDRS PROTOCOL

Key words: Visual acuity, ETDRS

Summary:

Visual acuity (VA) measurement is a simple and fast “everyday test” to any optometrist. Checking VA is so easy that optometrist may forget or even may not be aware of the important rules concerning about VA measurements. Optometrist is a “gold standard” of eye examinations and therefore it is essential that optometrist is deeply aware of all the official rules of VA measurements.

Optometrists do eye examinations usually by using projectors. There are dozens of different kind of projectors. Optotypes in the projectors differ greatly. Sometimes that can lead to different visual acuity scores to one single patient. Optometrist may also do the VA markings in a many different ways (acuity 0,5 – ect.). Unfortunately almost all optotypes that are used in projectors are not standardized and those optotypes should be used judiciously or not used at all in the situations of giving official statement of patients eyesight.

There may be many questions in VA measurements: What kind of optotypes should be used, how many optotypes must the patient see from one line, how to make right markings? Answers to all of those questions are found from VISUAL ACUITY MEASUREMENT STANDARD (VAMD) (International Council of Ophthalmology 1984). This standard is global and is still currently valid. All “official” VA measurements should be done by ETDRS protocol. The aim of this lecture is to go through the ETDRS requirements based on VAMD. All details about standardized optotypes, benefits of logarithmic VA scales, measurements in different distances ect. Will be discussed in this lecture.

Optometrists will be more and more responsible for being the primary eye care practitioners in all European countries. Our profession has to know all the details of examinations that it is responsible for. Otherwise the profession can not be the number one selection of giving official statements to different authorities concerning about patients eyesight. This lecture will explain all important details of VA measurements.

ID: 00302

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

JULIE-ANNE LITTLE¹, MICHAEL NTODIE^{1,2}, KATHRYN SAUNDERS¹

Affiliation:

1) Centre for Optometry and Vision Science, Biomedical Sciences Research Institute, Ulster University 2)
Department of Optometry, University of Cape Coast, Ghana

Presenter: JULIE-ANNE LITTLE

ACCOMMODATIVE PERFORMANCE IMPROVES WHEN HYPEROPIA IS CORRECTED DURING SUSTAINED NEAR VIEWING TASKS

Key words: accommodation, hyperopia, children, near work

Summary:

Purpose

Uncorrected hyperopia places extra burden on the accommodative system for near tasks. Some studies have reported improvement in reading/academic performance when hyperopia is corrected,^{1,2} and a detrimental effect to reading when hyperopia is simulated,³ but there are little data investigating the impact of correction on accommodative status in naturally hyperopic children. This study investigated accommodative performance of hyperopes in uncorrected and corrected conditions,⁴ during sustained near tasks.

Methods

Binocular photorefractometry (PowerRef3™, PlusOptix, Germany) assessed sustained accommodative performance in children with hyperopia (n=80) aged 5-10 years (mean±SD 7.79±1.60). Refractive error was determined by cycloplegic retinoscopy and hyperopia defined as $\geq +1.00D$ spherical equivalent of the least plus eye. Anisometropes $\geq 1.00D$ were excluded. Binocular accommodation measures were recorded while children engaged in two tasks (at 25cm) for 15 minutes each: an 'active' task (reading small print, Amazon Kindle), and a 'passive' task (watching animated movie, LCD screen) with and without correction. Reading speed was also assessed with and without correction (Wilkins Rate of Reading test). Data were cleaned and analysed in MATLAB and individual lens calibration applied. Accommodative response was averaged at one-minute intervals.

Results

Participants' hyperopia ranged from +1.00D to +7.25D. Correction of hyperopia improved accuracy of accommodative responses in both tasks, (*post-hoc* comparison: reading $t=2.38$, $p=0.02$; movie $t=2.19$, $p=0.03$). Reading speed also increased significantly with correction ($F_{(1,89)}=149.14$, $p<0.0001$). These enhancements with spectacle correction occurred across the spectrum of hyperopia magnitude. Neither near VA, stereoacuity, nor amplitude of accommodation were predictors of which individuals had an improved response with correction ($p>0.05$).

Conclusion

Spectacle correction significantly improves the accuracy of naturally hyperopic children's accommodative responses when undertaking near viewing tasks. However, not all hyperopic children are aided (in terms of accommodative response) by correction, and they are not identifiable through near VA, stereoacuity or accommodation. This underlines the importance of a comprehensive eye examination and the potential benefit of hyperopia correction even for children with adequate presenting acuity.

ID: 00310

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

STEEN AALBERG

Presenter: Steen Aalberg

VIRTUAL REALITY CLINICALLY APPLIED

Key words: VR, amblyopia, 3D, therapy

Summary:

Virtual Reality (VR) has already established solid foothold in entertainment, and as quality develops, it finds use in education and health care. There still posists a few areas of concern regarding vision and sensory matching to address, but applied under professionally controlled conditions it already presents a versatile tool in the neurooptometric field of vision therapy and rehabilitation.

In addition to just building and enhancing binocular skills, VR offers some unique options for dealing with developmental issues as strabismus and amblyopia and for vision rehabilitation after stroke and traumas resulting in a variety of vision problems. In critical cases, where establishing 3D sensing as a starting point is crusical for further development, the ability to individually control and manipulate the patient's visual world, opens a brand new way of creating these desired scenarios in a virtual reality.

The area of neurooptometry is receiving quickly raising interest from patients and public health care, and based on the number of patients presenting with vision problems where no competing treatment is available, the potential is huge.

A few challenging cases of amblyopia/strabismus, vision rehabilitation after concussion and diplopia following stroke are presented as examples for the application. A problem overview including available treatment options (new and traditional) for each case are described with the rationale for offering the VR treatment as part of the rehabilitation. Some underlying theses regarding the neurological basis why we may expect better and faster results in these and similar cases using VR than through a conventional approach are discussed.

Virtual Reality is a new versatile tool in optometric treatment of difficult vision problems as amblyopia, strabismus and rehabilitation of vision problems induced by brain injury. Its immediate value is demonstrated through case presentations.

ID: 00313

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

DINAH PARITZKY¹, RAVID DORON¹, RACHEL EICHLER¹

Affiliation:

1) Hadassah Academic College

Presenter: Dinah Paritzky

BRIDGING THE GAP: FROM CLASSROOM TO CLINIC

Key words: Active learning, EBP, reflection

Summary:

Content

Optometry students often find that the transition from theoretical lectures and technical practice to patient care in clinics is challenging. The optometry department at Hadassah Academic College designed a workshop called "Introduction to Patient Care" in order to bridge that gap. This workshop is given to second year students in the second semester, before they begin their clinical rotations at the start of their third year. The workshop has a maximum of 15 students who meet weekly for 13 weeks. The aims of the workshop are:

- to develop communication skills
- to encourage self-reflection and critical thinking
- to gain experience in analysing an optometric case
- to formulate an evidence based (EBP) plan
- to advance the student's self confidence in a clinical scenario

The workshop uses the following active- learning pedagogical methods:

- Role play
- Peer assessment
- Team Learning
- Case Based Learning

The Groningen Reflection Ability Scale was administered before and after the workshop in addition to student feedback at the end of the workshop.

Results

After completion of workshop, feedback from the students gave an average score of 4.22 on the Likert scale. The quantitative and qualitative analysis showed student satisfaction with the course is high and that its aims have been achieved.

The results of the reflection ability questionnaire showed an overall increase in some of the self-reflective abilities ($p < 0.05$) as a consequence of the workshop.

ID: 00315

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

DANIELA LOPES-FERREIRA¹, ALICIA RUIZ-POMEDA², ANTÓNIO QUEIRÓS¹, CÉSAR VILLA-COLLAR³

Affiliation:

1) CEORLab, Centre of Physics, University of Minho, Braga, Portugal 2) Department of Ophthalmology, Móstoles University Hospital, Móstoles, Madrid, Spain 3) Department of Pharmacy, Biotechnology, Optics and Optometry, European University of Madrid, Spain

Presenter: DANIELA LOPES-FERREIRA

LONGITUDINAL ASSESSMENT OF OCULAR AND CORNEAL ABERRATIONS IN CHILDREN WEARING DUAL-FOCUS MULTIFOCAL CONTACT LENSES

Key words: MiSight. Myopia. Contact lenses. Axial length. Children

Summary:

Purpose: To compare ocular and corneal aberrations in children randomly fitted with MiSight contact lenses (CLs) versus children corrected with single-vision spectacles (control) over a 2-years period.

Methods

Young subjects aged between 8 and 12 with low to mild myopia level (-0.75 to -4.00 D sphere) and low astigmatism (< -1.00 D cylinder) were assigned to the lens study group (Dual Focus contact lenses MiSight®, Coopervision, Omafilcon A, 60% water content, non-ionic) or the control group (single-vision spectacles). Axial length, corneal RMS (RMS_C), corneal high order RMS (HO_RMS_C), corneal low order RMS (LO_RMS_C), ocular total RMS (RMS_T), total ocular high order RMS (HO_RMS_T), total ocular low order RMS (LO_RMS_T), corneal Spherical Aberration (SA_C) and total ocular SA (SA_T) were measured at the baseline, 12-months, and 24-months visits. A 5 mm diameter was defined to analysis to comparison purposes. Only dominant eye was analyzed.

Results

Seventy-four Caucasian children completed the clinical trial: 41 subjects from MiSight group (age: 11.01 ± 1.23 years) and 33 single-vision group (age: 10.12 ± 1.38 years). After 2 years of follow-up period, axial length (0.444 ± 0.049 mm, $p < 0.001$) changed significantly in control group and also RMS_T ($0.565 \pm 0.199 \mu\text{m}$, $p = 0.029$) and LO_RMS_T ($0.461 \pm 0.175 \mu\text{m}$, $p = 0.047$). Only axial length showed significant changes (0.284 ± 0.025 mm, $p < 0.001$) in MiSight group after 2 years. The SA_C and SA_T did not reveal significant changes between visits or between groups, in none follow-up visits.

Conclusions Children that wear dual-focus multifocal CL along 2 years did not present significantly different ocular or corneal aberrations comparing with children than wear single-vision spectacles.

ID: 00317

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

Dr Tamsin Callaghan¹, Dr Lee Jones¹, Dr Peter Campbell^{1, 2}, Dr Pete R. Jones¹, Dr Deanna J. Taylor¹, Dr Daniel S. Asfaw¹, Prof David F. Edgar¹, Prof David P. Crabb¹

Affiliation:

1) Division of Optometry and Vision Sciences, School of Health Sciences, City, University of London, London, England, EC1V 0HB

Presenter: Tamsin Callaghan

Acceptability of a home-based visual field test (Eyecatcher) for glaucoma home monitoring: A qualitative study of patients' views and experiences

Key words: Glaucoma, Home monitoring, Qualitative research

Summary:

Purpose To explore the acceptability of home visual field (VF) testing using Eyecatcher among people with glaucoma participating in a 6-month home monitoring pilot study.

Methods Twenty adults (10 female; median age 71 years) with a diagnosis of glaucoma were recruited in the United Kingdom through an advertisement in the International Glaucoma Association newsletter. All participants were issued a tablet-perimeter (Eyecatcher), and were asked to perform one VF home-assessment per eye, per month, for 6 months (12 tests total). Participants took part in a semi-structured interview regarding acceptability of home monitoring at the end of the study. Interview transcripts were analysed using thematic analysis.

Results All participants could successfully perform VF testing at home. Interview data were coded into four overarching themes regarding experiences of undertaking VF home monitoring and attitudes towards its wider implementation in healthcare: (1) Comparisons between Eyecatcher and Humphrey Field Analyser (HFA); (2) Capability using Eyecatcher; (3) Practicalities for effective wider scale implementation; (4) Motivations for home monitoring.

Conclusions Glaucoma patients were widely accepting and highly capable of home VF testing. Eyecatcher was compared positively to conventional VF testing using HFA. Home monitoring of VFs may improve glaucoma service delivery in the hospital eye service.

ID: 00320

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

NIALL FARNON¹ , JEFFREY WEAVER^{1,2}

Affiliation:

1) University of the West Indies 2) University of Missouri - St. Louis

Presenter: Niall Farnon

NUTRITION AND DRY EYES

Key words: Dry Eye, Nutrition, Treatment, Vitamins

Summary:

With so much information in the media and journals about nutrition and the eyes, we will present the topic of nutrition and dry eyes using up to date research.

Content

It is important for optometrists to be able to explain the patient's dry eye condition and how nutrition can play a part in its management. This starts with recognising the symptoms of dry eyes and offering appropriate advice to the patient. Correct advice can only come from discerning the latest research with respect to dry eyes and nutrition.

Actions taken

The authors present a summary of the various symptoms, causes and treatments of dry eyes, though discussing the latest research studies, sources and recommended amounts of the following treatments:

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K
- Vitamins B6 & B12
- Omega 3, 6 & 9
- Gefarnate
- Chinese Herbs

Recommendations

Dry eye is a condition that is growing in prevalence, so more patients will be presenting with symptoms. While artificial tears and topical prescription medication will continue to be popular, research has demonstrated that there are other options that may be helpful to optometrists treating this condition.

ID: 00322

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

ALEJANDRO CERVIÑO¹, ROBERT MONTÉS-MICÓ¹, NOELIA MARTINEZ-ALBERT¹, JOSE VICENTE GARCÍA-MARQUÉS¹, SARAH MARIE²

Affiliation:

1) University of Valencia 2) Essilor International SA

Presenter: Alejandro Cerviño

CLINICAL DETERMINATION OF LIGHT DISCOMFORT. EVALUATION OF A NEW CLINICAL DEVICE FOR THE QUANTIFICATION OF DISCOMFORT THRESHOLDS

Key words: discomfort glare, reliability, light sensitivity, healthy population

Summary:

Purpose: To assess the performance of a new device for the clinical determination of light discomfort quantitatively on a large sample of healthy adult human subjects.

Methods

A total of 489 subjects with ages ranging from 20 to 70 years (241 men, 248 women) were examined with the LUMIZ™ 100, a new handheld, portable, clinical device for the determination of light discomfort thresholds. The device uses two different LED sources (Warm:4000°K, and Cold:6500°K), and three presentation protocols (Continuous warm source, Continuous cold source, and flashing warm). Two thresholds were obtained for each protocol: "Just perceived" (JP) and "really disturbing" (RD) discomfort. Repeatability was assessed by means of coefficient of variation and ICC of three consecutive readings. Repeated measures ANOVA, Kruskal-Wallis test, and correlation analysis were applied to test for differences between repeated measures, and the effects of age on reliability.

Results

Discomfort thresholds are well distributed across the range of light intensities. 25% of subjects did not reach discomfort at 10000 lux. Intrasection ICCs were higher than 0.849 for all thresholds, and 75% of the CoV were below 10%. Thresholds obtained in the first set of measurements were highly correlated with the median of 3 sets ($r^2 > 0.8$). Age did not affect discomfort thresholds ($p = 0.30$), nor affected reliability of the measurements (variance on CoV, $p = 0.368$)

Conclusions

The new device provides good intrasection repeatability for the clinical determination of light discomfort thresholds. Reliability is good across age groups. The new device is useful for the quantitative clinical determination of light discomfort

ID: 00325

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

SALMA AHMAD¹, MIRIAM CONWAY¹, IRENE CTORI¹, RAKHEE SHAH¹, CATHERINE SUTTLE¹

Affiliation:

1) Applied Vision Research Centre, City, University of London, Northampton Square, London EC1V 0HB.

Presenter: Salma Ahmad

ARE CHILDREN PART OF THE COMMUNITY SERVED BY COMMUNITY OPTOMETRISTS?

Key words: Children, Eye examination, Autism, Optometry

Summary:

Purpose

The need for good vision in both eyes during childhood makes it essential that children have access to eye examinations. The aim of the study was to investigate the accessibility of eye examinations for young children with or without autism.

Method

A telephone survey was carried out to investigate the accessibility of eye examinations for four hypothetical scenarios – a child aged 1, 3, 5 years and a 13-year-old with autism. 400 optometric practices in England were randomly selected of which 100 were telephoned to establish the availability of a sight test for each of the four scenarios. The researcher, acting as a member of the public, used scripted questions for each scenario to determine: i) whether the practice will examine children; ii) at what age and iii) given a concern regarding the child's vision, what advice would be offered. Information was taken from the practice staff member who answered the telephone.

Results

56/400 practices (14.0%) said they would see a young child at any age. The mean age at which practices would start seeing children was 3.6 ± 1.7 years. For scenario 1 (1-year-old), 29% offered a sight test; 54% for scenario 2 (3-year-old), and 99% for each of scenarios 3 and 4 (5-year-old & 13-year-old). 119/400 (29.8%) optometric practices declined to offer a sight test, and 80% of these recommended the child should see their GP or health visitor. Of the practices who declined to examine the 1-year-old and 3-year-old, the mean age at which practices would examine children is 3.9 ± 1.1 years and 4.4 ± 0.6 years respectively.

Conclusion

Our results suggest a child's age is a potential barrier to accessing eyecare in a primary setting. Eye examinations are more accessible for older children (scenarios 3 and 4) compared to younger children (scenarios 1 and 2). More research is needed to understand why this barrier exists, and to identify corresponding enablers to ensure that timely eyecare is provided to all children.

ID: 00326

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

IRENE CTORI¹, SOPHIE WILLIS¹

Affiliation:

1) City, University of London

Presenter: Irene Ctori

UNDERSTANDING ISSUES AROUND SUPPORTING AND PROMOTING SUCCESS FOR STUDENTS FROM NON-TRADITIONAL ROUTES: THE TRANSITION FROM A FOUNDATION PROGRAMME TO BSC OPTOMETRY

Key words: student transition, foundation year, optometry degree,

Summary:

There has been some research into the challenges of effective student transition from school/college to higher education (HE); less has considered progression from foundation level to honours degree, particularly for non-traditional students. The transition experience may be considerably more stressful and isolating for such students due to differences in 'social and cultural capital' that they typically enter higher education (HE) with, leading to increased risk of student attrition. Additionally, psychological and emotional aspects around progression e.g. 'not being good enough' and 'not fitting in' have also been identified as barriers to successful progression.

Content

The aim of the present study was to explore experiences of students having undertaken the Foundation Degree in Ophthalmic Dispensing (FDOD) and progressed to BSc Optometry. An intrinsic case-study was conducted within an interpretive framework. Data were gathered via individual semi-structured interviews with participants studying on the FDOD (n=3) or BSc Optometry having progressed from FDOD (n=6). All data were analysed thematically following an initial structural coding framework and subsequently a second cycle pattern coding framework.

Results

The following 4 themes emerged:

- Embrace learner diversity within cohorts - staff should be aware of increased diversity and seek to positively draw upon range of experience that students possess
- Academic skill development - value of FDOD in providing students with skills to support their future learning at BSc level should be more explicitly articulated early within programme delivery
- Clear expectations of HE experiences - simplicity and clarity at outset of student's professional learning and commitment to build positive student relationships
- The status of foundation years need to be reconceptualised - to enhance student's perceived status and the perceived status of the course itself

Recommendations/Conclusions

There is a need to provide positive early student experiences that sustain engagement and promote progression. Attention is needed to focus on the unique ways in which diversification of the student body has necessitated more individualised approaches to facilitate this. Such approaches may help to enhance retention and reduce the attrition that is acknowledged to happen early on in a student's HE career.

ID: 00328

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

ANASTASIJA GORDEJA¹, EVITA KASSALIETE¹, KAROLA PANKE¹, ANETE PETROVA¹

Affiliation:

1) University of Latvia, Faculty of Physics, Mathematics and Optometry, Department of Optometry and Vision Science

Presenter: Evita Kassaliete

ACCOMMODATION RESPONSE IN VARIOUS DESIGN SOFT CONTACT LENSES WEARERS

Key words: Lag of accommodation, multifocal contact lenses, addition

Summary:

Purpose

One of the most important problems among young people is progressive myopia, which is characterized by inaccurate accommodation activity. Studies show that multifocal contact lenses have different influence on accommodation response (*Costa et al.*, 2011). The aim of this study was to assess Lag of accommodation with different design contact lenses at different accommodative stimulus.

Methods

Participants: 10 emmetrops with refractive spherical equivalent of -0,50D to +0,50D. Age 22-28. By the "PowerRef 3" unit measured the eye accommodation response in two distances 25cm and 40cm using spherical (+1,50 and +2,5D) and multifocal contact lenses (Air Optix Aqua Multifocal by Alcon (AOAM) sph: planum with Med and Hi and Biofinity Multifocal (BM) by Cooper Vision sph: planum ADD 1,50D and 2,0D). We compared the results between accommodation Lag without correction and with contact lenses to determine the design efficiency and usefulness at optometrist practice.

Results. The Lag of accommodation were $1,05 \pm 0,11D$ for stimuli at 40cm and $1,53 \pm 0,11D$ for stimuli at 25cm. Evaluating multifocal contact lenses on accommodation Lag, we found - near profile decrease the Lag. AOAM Med shows $0,82 \pm 0,12D$ for stimuli at 40cm and $1,09 \pm 0,18D$ for stimuli at 25cm and AOAM Hi $0,77 \pm 0,11D$ and $1,20 \pm 0,14D$. Contact lenses with far profile did not produce statistically significant changes in decreasing the Lag. With BM ADD1,5D we get $1,32 \pm 0,09D$ for stimuli at 40cm and $1,72 \pm 0,15D$ for stimuli at 25cm and with BM ADD2,0D - $0,80 \pm 0,14D$ and $1,44 \pm 0,18D$. Sphera + 1,50D shows the Lag $0,89 \pm 0,14D$ for stimuli at 40cm and $1,18 \pm 0,19D$ for stimuli at 25cm and sphera + 2,50D - $0,58 \pm 0,12D$ and $1,08 \pm 0,16D$.

Conclusion. The results confirmed by literature. Near profile contact lenses significantly affects accommodation Lag reducing as effectively as positive spherical contact lenses. The strength of the additive used does not significantly change the results. Multifocal contact lens with a far profile showed different results depending on the strength of the additive used.

Acknowledgements: Supported by University of Latvia and the University of Latvia Foundation (Project No.2184).

ID: 00329

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

BENNETT MCALLISTER¹

Affiliation:

1) Western University of Health Sciences

Presenter: Bennett McAllister, OD, FAAO

ENHANCING PATIENT CARE WITH DIRECTED SYMPTOM SURVEYS

Key words: Clinical, History

Summary:

Validated Symptom Surveys in Everyday Clinical Practice including those for Dry Eye, Learning Related Vision Skills, Functional Independence in Vision Rehabilitation and Brain Injury.

Patient history taking has a long- and well-established path, perhaps, lulling practitioners into complacency with the way they learn about the patient. While this EAOO has a technology theme, advances in clinical care are not limited to electronic or “techie” topics. This course is intended for all levels of clinicians, challenging them to re-examine their methodology of exploring patient history and expanding their care options while minimizing their own personal expenditure of time.

Traditional History:

1. Chief Complaint
2. History of Present Illness (HPI)
3. Review of Systems (ROS)
4. Past, Family and Social History (PFSH)

Issues with Traditional History:

1. Incompleteness
2. Patient memory
3. Not always significant
4. Omissions/Commissions
5. Rigid with no Branching Follow-up

Directed Symptom Survey

1. Introduction
2. Design Standards
3. Validation

Selective and Useful Directed Symptom Surveys

1. Ocular Surface Disease Index (OSDI)
2. Convergence Insufficiency Symptom Survey (CISS)
3. College of Optometrists in Vision Development (COVD)
4. Functional Independence Measure (FIM)
5. Brain Injury Vision Symptom Survey (BIVSS)

Incorporating Directed Symptom Surveys into Everyday Practice
Future Directions

ID: 00332

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

PAUL MURPHY^{1,2} , BRIANNA SAMSON¹ , SHAMROSE KHAN¹

Affiliation:

1) University of Waterloo, School of Optometry and Vision Science, Canada 2) Cardiff University, School of Optometry and Vision Sciences, UK

Presenter: Paul Murphy

DISCOVERING STUDENT MOTIVATIONS FOR OPTOMETRY AS A CAREER

Key words: motivations, career, education

Summary:

Purpose

To develop and test a suitable survey tool to assess optometry students' motivations and expectations of optometry.

Methods

A literature review of recent publications on student motivations, when selecting a degree program, identified several areas of interest: university reputation, relative geographic location, student influencers, career expectations, intrinsic and extrinsic motivators. Based upon this review, and on existing student surveys of student motivation in optometry and other healthcare professions, a draft survey was developed. The initial draft was reviewed by a small committee of optometry educators for overall aim and structure. A second draft was reviewed by optometry graduate students for specific content and question structure. To test the survey, a pilot study was undertaken on 1st and 4th year optometry students at the School of Optometry and Vision Science, University of Waterloo. Data was collated using REDCap survey software, and analysed using SPSS Statistics v.25. Ethical approval for the study was obtained from the University of Waterloo. The survey consisted of 34 questions in rank, multiple-choice, check-box, and open format, that inquired on student demographics, career motivations, institution motivations, exposure to the field, and career expectations. Subjects were recruited by announcements after lectures and through e-mail. The study was completed in January 2019.

Results

Demographics: 116 students completed the survey (77: 1st year; 39: 4th year; 73% female; 27% male). Career motivations: 86% optometry was 1st career choice; other choices: medicine, dentistry, pharmacy; top motivations: good work/life balance; interest in health sciences; desire to help people. University motivators: location, tuition cost. Future career expectations: 95% private practice, 40% corporate, 30% hospital; more than 50% interested in owning own practice; top motivators for place of work: close to family, job availability, close to friends.

Conclusion

1) Survey was able to gather useful information on student motivations and expectations for optometry as a career. 2) Male/female demographic continues the current profession pattern. 3) Intrinsic and extrinsic factors are top motivators for optometry students. 4) Strong interest in private practice. 5) Further validation of survey useful in a wider comparison across optometry students in other universities and countries will be useful.

ID: 00333

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

JUAN CARLOS ONDATEGUI-PARRA¹, LAURA ROSAS LAPEÑA², ERIKA MAYOR TISCAR², CRISTINA XAMENA MARTIN²

Affiliation:

1) Universitat Politècnica de Catalunya; Center of Development of Sensors, Instruments and Systems. (CD6) 2) Universitat Politècnica de Catalunya; University Vision Center (CUV)

Presenter: Juan Carlos Ondategui-Parra

READING VISUAL ACUITY VS READING SPEED IN SPANISH ELDER POPULATION

Key words: Visual Acuity, Reading Speed, Reading Visual Acuity

Summary:

Purpose

Near vision tasks are being more common due to the development of new technologies so that, it is very important to have an accurate visual acuity (VA) and good reading performance abilities. The aim of this study is to measure reading visual acuity (RVA) and reading speed (RS) in a group of Spanish elderly population.

Methods

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

A RS and VA examination has been done in a group of 88 patients (63 women and 25 men) with an average age of $84,58 \pm 7,82$ (range: 62-99) years old. Clinical information and clinical history were obtained. VA was evaluated with a conventional optotype (Bailey-Lovie test). The RA test consists of 3 presentations of 24 sentences each, with a range of AV between 0.8 and -0.3 logMAR. The RS test consists of 6 presentations of 9 sentences each, all of VA 0.5 logMAR.

Results

It has not been possible to take a 17,05% of measures of RVA and neither the 37,12% of measures in the RS exam because the subject showed lack of comprehension, illiteracy or inadequate visual acuity. The average of conventional VA has been for right eye (RE) $0,49 \pm 0,32$ LogMAR, for left eye (LE) $0,48 \pm 0,28$ LogMAR and for both eyes (BE) $0,38 \pm 0,29$ LogMAR, lower values than the average on RVA: $0,34 \pm 0,22$ LogMAR (RE), $0,37 \pm 0,24$ LogMAR (LE) and $0,27 \pm 0,22$ LogMAR (BE) with differences statistically significant. Regarding the RS was obtained $127,83 \pm 47,43$ wpm (RE), $129,56 \pm 42,94$ wpm (LE) and $137,53 \pm 48,23$ wpm (BE).

The results of correlations between VA and RVA ($r=0,80$; $p<0,001$) and VA and RS ($r=-0,45$; $p<0,01$) were statistically significant.

Conclusion:

Both RA and RS tests are clinically acceptable because there is a good correlation between VA measures and present valid real performance information that does not present Visual Acuity Test. It is necessary more studies with a bigger group of population and other ocular conditions.

ID: 00339

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

ZANE JANSONE-LANGINA¹, RENARS TRUKSA¹, MARUTA JURJANE²

Affiliation:

1) University of Latvia, Department of Optometry and Vision Science, Riga, Latvia 2) Pauls Stradiņš Clinical University Hospital, Riga, Latvia

Presenter: Zane Jansone-Langina

COLOUR VISION SENSITIVITY CHANGES ONE WEEK AFTER CATARACT REMOVAL SURGERY

Key words: Cataract, colour vision, optometry

Summary:

Purpose

In optometrist practices we are dealing with patients who have cataract or have had cataract removal surgery. Colour vision tests can give information about pathological changes in the eye structures. Colour vision tests can give information about pathological changes in eye structures. Our aim was to evaluate if the colour vision chromatic resolution changes before and after cataract surgery

Methods

We used the saturated and unsaturated Farnsworth D15 Colour vision arrangement test, Hardy Rand and Rittler (HRR) to check color sensitivity changes before and after the cataract removal surgery. The results were analyzed: by summing the color differences between adjacent caps according to Bowman, by averaging color difference vectors according to Vingry and King-Smith (VK-S), and using linear regression line (LSR). In our research participated 50 eyes with cataract. Patients with lower visual acuity than 0.20 decimal units, glaucoma, diabetes, macular atrophys were excluded from research

Results

All three D15 analysing tests showed that cataract caused lens opacities to decrease significantly in visible light chromatic resolution. HRR test results showed colour vision sensitivity changes but there was no significant difference by ANOVA ($p < 0.05$). Conclusion: Colour vision tests can give us information how cataract evolves. After the intraocular lens implantation, 10 patients showed improvements in colour vision sensitivity, but they still had deviations from the norms, meaning that the color vision sensitivity changes not only due to the cataract but from other pathological factors as well.

ID: 00342

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

FABRIZIO ZERI^{1,2,3}, MATTIA GEROSA¹, MATTEO FAGNOLA², SILVIA TAVAZZI^{1,2}

Affiliation:

1) University of Milano Bicocca, Department of Materials Science, Milan, Italy 2) University of Milano Bicocca, Research Centre in Optics and Optometry (COMiB), Milan, Italy 3) Ophthalmic Research Group. School of Life and Health Sciences, Aston University, Birmingham. UK

Presenter: Fabrizio Zeri

INTER AND INTRA-OBSERVER RELIABILITY IN ASSESSING TEAR MENISCUS HEIGHT IN DIFFERENT POSITIONS BY A NEW DIGITAL DEVICE

Key words: tear meniscus height, intra observer reliability, inter observer reliability

Summary:

Purpose

To evaluate inter and intra-repeatability of the tear meniscus height (TMH) assessment.

Methods

A set of 153 pictures of lower tear meniscus (76 of ODs and 77 of OSs) were selected from the database of the Research Centre in Optics and Optometry (COMiB) and arranged in a new database. Four observers (2 new graduated optometrists and 2 optometrists with more than 20 years of clinical experience) measured the TMH of each picture in three different points, centrally and at 30 degrees temporally and nasally, by the software named *Dry Eye Report* (CSO, Firenze, Italy). Pictures' patient name was masked and the order of presentation of pictures randomised. Each observer was requested to repeat the overall measurement after 15 days.

Results

Central TMH measured by the 4 observers resulted in ranging between 0.09 and 0.86 mm and between 0.08 and 0.54 mm on the OD and OS respectively. Nasal TMH resulted in ranging between 0.08 and 0.86 mm and between 0.04 and 0.74 on the OD and OS respectively. Temporal TMH resulted in ranging between 0.08 and 0.60 and between 0.06 and 0.61 on the OD and OS respectively.

For the OD, the intraclass correlation coefficient (ICC) calculated among the 4 observers resulted 0.94, 0.95 and 0.90 for the central, nasal and temporal measures respectively. For the OS, the ICC resulted 0.94, 0.95 and 0.90 for the central, nasal and temporal measures respectively. TMH measurements among 4 observers resulted different for each position measured in both eyes (Friedman One-way ANOVA, all $p < 0.001$). Intra-observer reliability for pictures of both eyes and the 3 positions of measurement was good for all the observers (all ICCs > 0.79). More experienced clinicians did not show better ICC values.

Conclusions

The inter-observer reliability in assessing TMH by a new digital device of measurement appeared extremely good in terms of ICCs for both eyes and either centrally, nasally or temporally. Although the average of measures across observers resulted statistically significant, the differences appear clinically negligible. Finally, also intra-observer reliability in TMH resulted very good and not affected by clinical expertise of the observers.

ID: 00343

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

AIGA SVEDE^{1,2}, ALINA KUCIKA^{1,2}, ILONA RUMJANCEVA^{1,2}, TATJANA PATROVA^{1,2}, GATIS IKAUNIEKS^{1,2}, VARIS KARITANS¹, KRISTINE DETKOVA², AIJA MUCENIECE³

Affiliation:

1) University of Latvia, Faculty of Physics, Mathematics and Optometry, Department of Optometry and Vision Science, Jelgavas str. 1., Riga, LV-1004, LATVIA 2) OC Vision, Elijas str. 17, Riga, LATVIA 3) Optic Guru, Mednieku str. 21/23, Ogre, LATVIA

Presenter: Aiga Svede

EFFECT OF OPTOMETRIC OFFICE SIZE ON THE ASSESSMENT OF SUBJECTIVE REFRACTION AND VISUAL ACUITY

Key words: optometric office, subjective refraction, testing distance, visual acuity

Summary:

Purpose

The presentation will focus on limited amount of information about requirements for optometric offices. Only some suggest that testing distance for visual acuity must be 4-6 m. However, nowadays practice demonstrates that the optometric offices do not always provide even 4 m testing distance and mirror systems are not always used. This can affect both the visual quality and the assessment of dynamic changes of visual acuity and refraction state of the eye with some progressive eye condition. The aim of our study is to assess the effect of the optometric office size on the accuracy of subjective refraction measurement.

Methods

To specify the necessary viewing distances for subjective refraction evaluation, 17 optometric offices were analysed: the area was 7.26-18.49 m² (14 were below 12 m²); the distance from the backrest of the patient's chair to the screen was 3.19-5.07 m. If a patient is seated in the chair with straight back, the distance to the screen is reduced, in some cases even becoming less than 3 m. Therefore, five testing distances (6, 5, 4, 3, and 2.5 m) were chosen to assess subjective refraction, which provides visual acuity 1.0 (decimal units), and the maximum subjective refraction that gives the best visual acuity. 55 patients (dominant eye only) were tested with trial frame and EyeRefract (Visionix).

Results

Compared to 6 m (that is closer to infinity), the results demonstrate that both assessed subjective refractions changes in hyperopia direction for all types of refraction with decreasing testing distance. The maximum subjective refraction that was detected at 5 m had clinically insignificant 0.06 D shift in hyperopic direction. Closer testing distances demonstrated statistically and clinically significant shifts: 0.20 D for 4 m, 0.28 D for 3 m, 0.36 D for 2.5 m.

Conclusions

In conclusion, we do not advise to use small rooms as optometric offices without a mirror system. The room should allow to have testing distance of at least 4 m where subjective refraction correction is 0.25 D to simulate visual acuity at infinity as previously predicted by Hofstetter (1973). Closer distances do not have such simple correction abilities.

ID: 00345

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

BRETT BENCE¹

Affiliation:

1) Northwest Eye Surgeons

Presenter: Brett Bence

THE DIAGNOSTIC DILEMMA OF OPTIC DISC EDEMA

Key words: papilledema, ischemia, neuropathy, diagnosis

Summary:

Content/case presentations

Optic nerve swelling or inflammation anterior to lamina cribrosa is classically from obstruction of axoplasmic flow. On fundusoscopic examination, this is a startling view with one or more of the following: blurred disc margins, elevated rim tissue, loss of cup, tortuous adjacent blood vessels, local hemorrhages and exudates, and others. We briefly explore the primary underlying causes of disc edema, including inflammation (optic neuritis/papillitis), ischemia (ischemic anterior optic neuropathy), increased intracranial pressure (pseudotumor cerebri), and compression (glioma, meningioma). The primary diagnostic tests for optic nerve function include testing of pupils, color vision, comparing brightness or red desaturation between the eyes, and visual field.

We review each of these 4 general causes of optic disc edema with a case presentation. The cases include an overweight 28-year-old female with pseudotumor cerebri, a 68-year-old woman with giant cell arteritis and ischemic optic neuropathy, a 33-year-old female with anterior optic neuritis and/or neuro-retinitis, and a 76-year-old man with a frontal lobe meningioma.

Actions taken

We follow the standards of care in each case. Sequentially as listed above, the pseudotumor patient was treated with diuretics and nutritionist referral for weight loss; the A-AION patient unfortunately lost complete vision in both eyes after oral and ultimately IV corticosteroids; the neuro-retinitis patient was diagnosed with Bartonella henselae bacterial infection (cat scratch disease) and was treated with Azithromycin; and the patient with the meningioma was referred for surgery and debulking of the tumor.

Recommendations/conclusions

These cases represent the many underlying potential causes of optic disc edema. The clinician must employ diagnostic testing, disc and adjacent retinal observation, medical history, and instinctive analysis to obtain the working diagnosis.

ID: 00349

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

BRIDGITTE SHEN LEE¹

Affiliation:

1) Vision Optique

Presenter: Bridgitte Shen Lee, OD, FBCLA, FAAO

DIGITAL EYE HEALTH SYMPTOMS AND SOLUTIONS

Key words: Digital Eye Strain, Computer Vision Syndrome, Dry Eye Disease, Digital Eye Health

Summary:

68% (5.14 billion) of the world's 7.59 billion people have a mobile phone. 54% (4.02 billion) are internet users for both work and social engagement. Primary eye care providers should routinely ask their patients about screen habits, digital eye strain (DES), and dry eye symptoms. This presentation will review the evolution of digital usage; identify the cause of various DES symptoms; and discuss the latest ophtalmic lens, contact lens, dry eye solutions, and healthy digital habits to manage DES. In addition, it will share practice management pearls to attract and retain patients by providing effective Digital Eye Health®

Results/Discussion

The evolution of today's digitally connected lifestyle, its demand on patients' visual systems and general health, and the mechanisms or cause of various digital eye health symptoms will be reviewed for the top five Digital Eye Strain (DES) symptoms: neck and shoulder pain, eye strain, blurred vision, headache, and dry eye.

Our modern digital lifestyle and habits contribute to increasing dry eye symptoms, and the compromised tear film reduces quality of vision and refraction. It is important for primary eye care providers to effectively identify the signs and symptoms, and to provide solutions available in their region.

ID: 00350

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

BRIDGITTE SHEN LEE¹

Affiliation:

1) Vision Optique

Presenter: Bridgitte Shen Lee, OD, FBCLA, FAAO

OCULAR SURFACE COMPLICATIONS FROM EYELASH OBSESSIONS

Key words: Dry Eye Disease, Demodex, Blepharitis, Eyelash Extensions

Summary:

The global eyelash business is a USD1.7 billion industry. Many women who utilize growth serums, extensions and falsies show up in primary eye care practices daily. This presentation will teach eye care providers how to effectively identify and treat ocular surface disease complications. Comprehensive TFOS DEWS II based diagnostic and management methods are reviewed for both basic and advanced dry eye services settings. In addition, this presentation provides practice management pearls on how to gain referrals and expand ocular aesthetics and dry eye services.

Content or Case Presentation

Current global eye beauty trends, cosmetics ingredient and application methods, and their ocular surface complications will be reviewed. TFOS DEWS II (Tear Film & Ocular Surface Society Dry Eye Workshop Report II) Dry Eye Disease definition and management will be reviewed. Effective diagnosis and management solutions from both North American and European markets will be discussed with three case reports of women with eyelash extensions complications.

After the presentation, participants will be able to:

1. Understand various eyelash growth serums, falsies, extensions, cosmetic and beauty trends, and their undesirable effects on the ocular surface;
2. Identify and effectively manage the following complications from both basic and advanced dry eye services perspectives: blepharitis, demodex, meibomian gland dysfunction, dry eye disease, conjunctivitis and ocular dermatitis; and
3. Expand and develop ocular aesthetic and dry eye services and gain referrals from both patients and facial aesthetic procedures providers

ID: 00351

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

EINAT SHNEOR¹, JOSEPH FRUCHT-PERY^{1,2}, EDNA GRANIT¹, MICHEL MILLODOT³, ARIELA GORDON-SHAAG¹

Affiliation:

1) Dept. of Optometry and Vision Science, Hadassah Academic College, Jerusalem, Israel 2) Department of Ophthalmology, Hadassah-Hebrew University Medical Center, Jerusalem, Israel 3) Hong Kong Polytechnic School of Optometry

Presenter: Einat Shneor

SPECIFIC TOPOGRAPHIC PATTERN OF FIRST-DEGREE RELATIVES OF PATIENT PRESENTING WITH KERATOCONUS

Key words: Keratoconus, Scheimpflug imaging, Topography pattern

Summary:

Purpose

Keratoconus (KC) patients have specific corneal topography patterns (e.g steepening pattern and/or asymmetric bowtie (ASBW) with skewed radial axes). The prevalence of KC in Israel is relatively high with ~25% of the patients reporting having a first-degree relatives with KC. This study describes corneal parameters and topography pattern of KC and KC-suspect in first-degree relatives of KC patients compared to normal controls, to test if first-degree relatives had unique clinical characteristics.

Methods

This prospective study was approved by the institution's Ethics Committee, and included autorefractometry, visual acuity (Snellen), slit-lamp biomicroscopy, retinoscopy, subjective refraction and Scheimpflug imaging (Sirius, CSO). Subjects included KC patients and their first-degree relatives. KC was defined as abnormal topography/tomography and at least one clinical sign. KC-suspect was defined as abnormal topography/tomography without clinical signs. Data were compared to normal controls (cohort from previous study). Anterior (ant) topography pattern was classified by three blind examiners using Bogan and Rabinowitz classifications. Analysis included descriptive statistics and T-test.

Results

Fifty-four first-degree relatives of 14 KC subjects participated in this study. KC or KC-suspect was detected in 10 cases (18.5%, 2 KC, 8 KC suspect, age-range: 9-55 years) and had significantly lower tomography values compared to 91 controls for all parameters ($p < 0.03$) aside from posterior (pos) K1 ($p = 0.19$) and posK2 ($p = 0.10$). The healthy family member ($N = 44$, age-range 6-63 years) had similar corneal parameters to controls (for antK1, antK2, pos K1, posK2 and Central Corneal Thickness, respectively; $P > 0.07$, but not for corneal minimum thickness, $P < 0.00$). Abnormal anterior topography patterns were more common in KC relatives than in normal controls (ASBW with inferior steepening (I-S), 12.1% vs 17.65; ASBW with skewed I-S, 4.4% vs 11.76%; superior steepening (1.1% vs 3.9%) and I-S (8.8% vs 17.65%) for KC relatives and controls, respectively. Conversely, normal anterior cornea patterns ("Round", "Oval" and "Symmetrical- Bow-Tie") were less prevalent in in KC relatives than in normal controls (45.1% vs. 59.3%, $p < 0.04$).

Conclusions

Abnormal anterior cornea patterns are more prevalent in first degree relatives of KC than in normal controls. Clinicians may consider corneal topography of first-degree relatives of KC patients as a screening tool for KC.

ID: 00352

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

ANA DIAZ-CORTES¹, SARA FONT ARMADANS², JUAN CARLOS ONDATEGUI-PARRA³

Affiliation:

1) Hospital de Sant Joan de Deu 2) Universitat Politècnica de Catalunya (UPC); Centre Universitari de la Visió (CUV) 3) Universitat Politècnica de Catalunya (UPC); Center of Development of Sensors, Instruments and Systems (CD6)

Presenter: Ana Diaz-Cortes

THICKNESS OF THE DIFFERENT LAYERS OF THE RETINA IN PATIENTS WITH ANISOMETROPIC, STRABISMUS AND DEPRIVATION AMBLYOPIA

Key words: Anisometropic Amblyopia, Strabismic Amblyopia, Deprivation Amblyopia, OCT

Summary:

Purpose

This prospective study was performed to measure and detect the differences on the thickness of the different layers of the retina in amblyopic eyes using optical coherence tomography (OCT). Measures were also made to healthy eyes of patients of similar ages as a control group.

Methods

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

Two different measures of optical coherence tomography was performed: Macula Radial that provides information of the average thickness and volume of the different layers of the retina and 3DV Macula, that provides information of the thickness of retinal nerve fiber layer (RNFL).

The sample of this study involved 11 patients ($7,72 \pm 1,85$ years) with anisometropic amblyopia (AA), 30 patients ($6,32 \pm 1,34$ years) with strabismic amblyopia (SA), 10 patients ($6,22 \pm 1,25$ years) with deprivation amblyopia (DA) and the measures were compared with a healthy eye of the group control (C) of 50 subjects ($10,03 \pm 2,60$ years).

Results:

For Macular layer of the retina the average thickness were in group AA: $289,71 \pm 13,64$ m, group SA: $288,98 \pm 16,23$ m, for group DA: $283,11 \pm 13,90$ m and for group C: $287,07 \pm 14,97$ m, and these differences were not statistically significant.

For RFL layer of the retina the average thickness were in group AA: $38,75 \pm 4,89$ m, for group SA: $35,37 \pm 5,47$ m, for group DA: $35,10 \pm 5,09$ m and for group C: $40,04 \pm 4,07$ m, and these differences were statistically significant ($p < 0,05$).

Conclusion:

The assessment of the different layers of the retina reveals that RFL layer of the retina is a biomarker for the different types of amblyopia. Macular layer do not show clinical differences between different amblyopia and healthy eyes. Further studies are needed to analyse more physiological biomarkers.

ID: 00353

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

RAKHEE SHAH¹, DAVID EDGAR¹, ZAHRA JESSA², PETER CAMPBELL¹, ROBERT YAMMOUNI³, ANGHARAD HOBBY¹, ABEEDA KHATOON⁴, KIKI SOTER⁵, RAJESH AGGARWAL³, BRUCE EVANS³

Affiliation:

1) City, University of London, UK 2) Royal National Institute of Blind, UK; Moorfields Eye Hospital, UK 3) Institute of Optometry, London, UK 4) Glasgow Caledonian University, UK 5) Specsavers Opticians, UK

Presenter: Rakhee Shah

COMMUNICATION BETWEEN COMMUNITY OPTOMETRISTS AND HOSPITALS: TOO MUCH VARIATION?

Key words: Referral, Optometrist, Hospital Eye Service, Reply

Summary:

Purpose

In the UK, most new patients seen in the hospital eye service (HES) originate from community optometrist (CO) referrals. Reported rarity of replies to the referring optometrist means the CO cannot determine whether the patient was seen and whether the problem for which they were referred has been addressed. We audited optometric referrals and replies, calculating referral reply rate (RRR).

Methods

Data were analysed from an audit of referrals from two optometric practices, one in England and one in Scotland, and from the HES units to which they referred. Practices were visited to obtain anonymised copies of ~150 consecutive referrals and any replies. The HES units were then visited to search for records of cases where no reply was received by the CO. Relevant clinical data from anonymised copies of referrals and replies were entered in an Excel spreadsheet for data analysis. An expert panel comprising two community optometrists and an ophthalmologist assisted in grading referrals and replies.

Results

157 and 132 referrals from COs in England and Scotland respectively were audited. The apparent RRR, based on replies received by COs, was 26% for England, 84% for Scotland. However, the proportion of referred patients who were seen in the HES unit to which they referred was only 71% for England; c.f., 96% for Scotland. An adjusted RRR was calculated from the number of replies divided by the number of referred patients who were seen in the HES unit for whom a reply was appropriate. The adjusted RRR was 38% (32/84) for England and 92% (109/118) for Scotland. The view of the grading panel was that the response to the referral was meaningful in 78% of referrals for England, 100% for Scotland. The reason for referral was addressed in 79% for England and 100% for Scotland. Additional analyses reveal higher quality referrals in Scotland than England.

Conclusion

There is considerable variation in the RRR in the two venues reported here. High-quality replies from the HES to COs acts as a feedback loop encouraging high-quality referrals. This benefits patients and clinicians and maximises efficiency within the health service.

Funding: This project received funding from the Association of Optometrists & Central Optical Fund.

ID: 00354

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

CHRISTINE ALLISON¹

Affiliation:

1) Illinois College of Optometry

Presenter: Christine Allison

VISUAL PERCEPTUAL TESTING FOR THE OPTOMETRIST

Key words: perception, training

Summary:

Children may have many issues holding them back in school, and one that is often overlooked is problems with visual perception. Optometrists are the correct professionals to test the areas of visual spatial, visual analysis, and visual motor skills to determine a plan to help these children succeed.

Content

We will discuss the different areas of visual perceptual dysfunction and how they relate to problems in school. We will then look at the different tests available and review how to perform them with a child.

Actions Taken

A review of how to properly score tests such as the Beery VMI, and the Test of Visual Perceptual Skills will be given. A basic review of some of the training techniques to work with these children in the office and at home will also be given.

Conclusion

It is important to test the areas of visual perception in any child who is struggling in school. Optometrists should be the ones testing and training children in this area to help them succeed.

ID: 00355

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

CHRISTINE ALLISON¹

Affiliation:

1) Illinois College of Optometry

Presenter: Christine Allison

USING TECHNOLOGY IN THE VISION THERAPY ROOM

Key words: vision therapy, oculomotor, perceptual

Summary:

Vision therapy has evolved to make in office activities more engaging and interactive. There are a number of computer based systems that can be used effectively to aid in oculomotor, accommodative, vergence, and perceptual training.

Content

We will review different options for computer based training using stereoscopic systems as well as 3 D systems, and virtual reality systems that are now on the market to aid in office vision therapy.

Actions Taken

A review of the types of techniques that are available for purchase for vision therapy such as the Right Eye, Sanet Vision Integrator, HTS4, and Vivid Vision systems among others will be discussed.

Conclusions

It is important to keep your vision therapy patients engaged and excited while doing in office vision therapy. There are many technological options that are appealing to add to your vision therapy options when working with these patients.

ID: 00356

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

ARIELA GORDON-SHAAG¹, JUDITH WILKS¹, EINAT SHNEOR¹, RAMESH S VE², SALAI DHAVAMATHI², JOAN GISPETS³ AND IRENE LANGE GEGEN⁴

Affiliation:

1) Dept. of Optometry. Hadassah Academic College, Jerusalem, Israel

2) Department of Optometry, Manipal College of Health Profession, Manipal Academy of Higher Education, India

3) Optics and Optometry Department. Universitat Politècnica de Catalunya. Barcelona, Spain

4) University of Eastern-Norway, Faculty of Health and Social Sciences, Department of Optometry, Radiography and Light design, Norway

Presenter: Ariela Gordon-Shaag

OPTOMETRIC CLINICAL REASONING VIA COLLABORATIVE ONLINE INTERNATIONAL LEARNING

Key words: digital and media literacy, online-lecture, online-meeting

Summary:

Content

Collaborative Online International Learning (COIL) connects students and lecturers in different countries for collaborative projects and discussions as part of their coursework, providing opportunities for global experiences built into programs of study. COIL enhances intercultural student interactions via online engagement, while providing universities a cost-effective way to ensure that their students are globally engaged.

A pilot program for COIL was designed with the partnership of four optometry educational institutions from Spain, Norway, India and Israel. Students from the optometry departments at the participating schools were invited to join the program and experience learning together with students from different cultures that have comparable approaches to optometry. Students learning outcomes where to be able to create relations through virtual meetings, present clinical cases, analyze and give feedback during the virtual meetings. Educational institutional outcomes included training of staff to supervise online, introduce clinical themes and interact with unknown students and their unfamiliar optometric background.

Results

The students met on a weekly basis for five weeks using Zoom, in four groups of six to eight students together with a supervisor, a member of staff from one of the participating schools. Each group had two or three students from each country. The language of instruction was English. The learning was centered around case studies, presented initially by the supervisor and then by the students with guidance from the supervisor. Discussions were encouraged and enabled the students to share their knowledge, experiences and interpretations. Student satisfaction was assessed using a Likert scale questionnaire was overwhelmingly positive. Faculty found it challenging and interesting to tailor feedback to students with unfamiliar backgrounds and learned to actively listen to students from diverse backgrounds.

Conclusions

International collaboration had provided the students and faculty with new experiences, the opportunity to meet other optometry students in other countries, to learn from each other's cultures and practices as well as gaining optometry knowledge. Many students felt that the experience encouraged them to pursue further international options for study and discovery. Thus, this pilot enabled students to gain clinical reasoning and internationalization skills in parallel.

ID: 00357

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

MIRJAM VAN TILBORG^{1,2}

Affiliation:

1) Hogeschool Utrecht, department Optometry, researchgroup Technology for Healthcare innovations 2)
Researchgroup Technology for Healthcare innovations HU

Presenter: Mirjam van Tilborg

ROLE OF EYE CARE PROFESSIONALS IN THE FIELD OF VISUAL FUNCTIONING AND DRY EYE

Key words: visual functioning, dry eye, health care system, prevention

Summary:

Of the eye care professionals in primary care the optometrist is a healthcare professional in “*pre-care*” with a key role in eye pathology screening. The movement of responsibility for patient care, for select ocular conditions, from ophthalmology to optometry is a currently a discussion topic in the Netherlands. This has been stimulated by the anticipated increase in the number of older adults in the population in the near future. This aging population will increase the need for diabetic, macular degeneration and glaucoma care, which will create pressure on ophthalmology provision. It is expected that the incidence of DED will also increase, creating further pressure on the healthcare system.

What are the responsibilities in primary care for opticians, contactlens specialists and optometrists in Dry eye care?

How can we cooperate with the General Practitioner and or ophthalmologists? This lecture will cover the do's and don'ts in dry eye care, to start prevention at early age and have eye to differentiate dry eye vs allergy vs asthenopia.

Recommendations will be given for understanding interdisciplinary and interprofessional dry eye care.

ID: 00358

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

SANTIAGO ESCANDÓN GARCÍA¹, JOSÉ MANUEL GONZÁLEZ MÉIJOME¹

Affiliation:

1) UNIVERSITY OF MINHO

Presenter: Santiago Escandón García

LIGHT DISTORTION AND CONTRAST SENSITIVITY FUNCTION IN PSEUDOPHAKIC POPULATION IMPLANTED WITH MONOFOCAL AND MULTIFOCAL IOLS

Key words: Presbyopia, Cataract Surgery, Quality of Vision, Light Distortion

Summary:

Purpose

To evaluate light distortion (LD) under dim illumination in two samples of pseudophakic patients implanted with monofocal and multifocal intraocular lenses (IOLs) following cataract surgery and compare them with a control phakic group.

Methods

In this prospective study, 79 patients were evaluated: 66 undergoing cataract extraction (age 67 ± 7 years) followed by implantation of monofocal and multifocal IOLs and 13 phakic patients with trace-to-mild cataract (Lens Opacities Classification System [LOCS] III ≤ 2 ; age 57 ± 5 years). Evaluation of visual acuity, contrast sensitivity (photopic and under glare conditions) and subjective Quality of Vision (QoV) questionnaire completion. LD was evaluated with a prototype device (Light Distortion Analyzer, Portugal).

Results

Best distance corrected visual acuity (BDCVA) was slightly improved with the monofocal and multifocal IOLs compared to the control group while near vision at 33cm was significantly better with the multifocal IOL and worsened slightly with the monofocal IOL. Light disturbance index (%) was statistically indistinguishable between control and monofocal group but was significantly lower in the control than the multifocal group. We observed a summation effect stronger in the multifocal group (29% lower binocularly). There was a low-to-moderate correlation of LD index with both age and contrast sensitivity values under glare for lower spatial frequencies.

Conclusions

Compared with patients with mild-to-moderate cataract, IOL implantation provides several benefits, but at the expense of some degree of increase in light disturbance perception. LD analysis is recommended when patients complain of visual problems particularly when other objective quality metrics are in the normal range data.

ID: 00362

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

PRIYA MORJARIA¹, ANDREW BASTAWROUS¹, GUDLAVALLETI VENKATA SATYANARAYANA MURTHY¹, JENNIFER EVANS¹, MEKALA JAYANTHI SAGAR², DINESH RAJ², KALLURI VISWANATH², CLARE GILBERT¹

Affiliation:

1) London School of Hygiene and Tropical Medicine 2) Indian Institute of Public Health 3) Pushpagiri Vitreo Retina Institute

Presenter: Priya Morjaria

EFFECTIVENESS OF A NOVEL MOBILE HEALTH (PEEK) AND EDUCATION INTERVENTION ON SPECTACLE WEAR AMONG CHILDREN IN INDIA: RESULTS FROM A RANDOMIZED SUPERIORITY TRIAL

Key words: Health education, mHealth, Behaviour change, School Eye Health

Summary:

Purpose

Uncorrected refractive errors can be corrected by spectacles which improve visual functioning, academic performance and quality of life. However, spectacle wear can be low due to teasing/bullying, parental disapproval and no perceived benefit. Hypothesis: higher proportion of children with uncorrected refractive errors in the schools allocated to the Peek educational package will wear their spectacles 3-4 months after they are dispensed.

Methods

A superiority, cluster-randomised controlled trial was undertaken in 50 government schools in Hyderabad, India using a superiority margin of 20%. Schools were the unit of randomization. Schools were randomized to intervention or a standard school programme. The same clinical procedures were followed in both arms and free spectacles were delivered to schools. Children 11-15 years with a presenting Snellen visual acuity of <6/9.5 in one or both eyes whose binocular acuity improved by ≥ 2 lines were recruited.

In the intervention arm, classroom health education was delivered before vision screening using printed images which mimic the visual blur of uncorrected refractive error (PeekSim). Children requiring spectacles selected one image to give their parents who were also sent automated voice messages in the local language through Peek. The primary outcome was spectacle wear at 3-4 months, assessed by masked field workers at unannounced school visits.

Results

701 children were prescribed spectacles (intervention arm: 376, control arm: 325). 535/701 (80%) were assessed at 3-4 months: intervention arm: 291/352 (82.7%); standard arm: 244/314 (77.7%). Spectacle wear was 156/291 (53.6%) in the intervention arm and 129/244 (52.9%) in the standard arm, a difference of 0.7% (95% confidence interval), -0.08, 0.09). Among the 292 (78%) parents contacted, only 13.9% had received the child delivered PeekSim image, 70.3% received the voice messages and 97.2% understood them.

Conclusion

Spectacle wear was similar in both arms of the trial, one explanation being that health education for parents was not fully received. Health education messages to create behaviour change need to be targeted at the recipient and influencers in an appropriate, acceptable and accessible medium.

ID: 00363

Type: Oral presentation abstracts

Topic: Abstracts with an optical theme

Authors:

MICHELE JURILLI¹, MARCO ULISES MORALES², DAVIDE CACCIATORE³, STEFANO VOLANTI³

Affiliation:

1) Fonda 2) University of Nottingham 3) Low Vision Centre of Rimini-AUSL della Romagna

Presenter: Michele Jurilli

EFFECTIVENESS OF CUSTOMIZED PRLOOP LENSES IN PATIENTS WITH CORRELATED OBJECTIVE (MICROPERIMETRY) AND SUBJECTIVE PRL

Key words: Eccentric Fixation, Magnifying Prism, PRL (Preferred Retinal Locus), Low Vision

Summary:

Prism therapy in low vision rehabilitation have been used in hemianopsias and overall field constriction. However, their prescription is less common in patients with macular disorders. Moreover, the analysis of the preferred retinal locus (PRL) to select prism orientation has been rarely reported.

Case Presentation

We studied the correlation of patient's spontaneous preferred retinal locus (PRL) found with the PRLoop chart (FONDA, Italy) and the objective PRL found with microperimetry, before the prescription of customised PRL Oriented Optical Magnifying Prism (PRLoop) in patients with late-stage dry AMD.

Actions taken

29 patients, 18 females and 11 males (mean age = 58.7 years) from 2 low vision clinics, with central vision loss secondary to dry AMD, best corrected visual acuity less than 0.5 LogMAR and no other concomitant eye pathologies, were recruited for PRLoop prescription. Prism base orientation (TABO) and dioptric power was determined after subjective PRL was calculated with the Subjective Prism Orientation Test (PRLoop Test) chart. Microperimetry (MP) was used to identify the objective fundus-related PRL. Correlation between SPOT and MP PRLs was studied. Main outcomes were PRL location (central, superior, inferior, nasal, temporal), PRL distance from the fovea and subjective evaluation during visual tasks wearing PRLoop. Secondary outcomes were fixation stability and mean retina sensitivity. Correlation was observed between variables.

20 patients had either superior (S) or inferior (I) PRL and 9 patients showed it either nasal (N) or temporal (T). 24 patients had a correlated PRL in both the SPOT and the microperimetry test. All 5 patients who had no PRL correlation showed a PRL either N or T and did not report an immediate visual comfort while wearing the PRLOOP prisms. Patients with a correlated subjective (PRLoop Test Chart) and objective (Microperimeter) PRL have reported an immediate benefit during visual tasks wearing the PRLoop.

Conclusions

Eccentric vision rehabilitation has been proved to be effective with microperimetry instruments, however such devices are highly costly. The PRLoop system is a valid novel technique that may be used as a more economic alternative to assess the location of the PRL with the purpose to prescribe customised prisms in late stage AMD patients.

ID: 00365

Type: Oral presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

EDUARDO, J. M. TEIXEIRA^{1,2}, ANTÓNIO, M. G. BAPTISTA³, FRANCISCO MIGUEL BRARDO^{1,2,4}

Affiliation:

1) Beira Interior University (UBI), Physics Department, Covilhã- Portugal; 2) Centro Clínico e Experimental em Ciências da Visão (CCECV- UBI) 3) Centro de Física, Universidade do Minho Campus de Gualtar, 4710-057 Braga, Portugal 4) Centro de Investigação em Ciências da Saúde da UBI (CICS- UBI)

Presenter: Eduardo Teixeira

PORTUGUESE PROGRAM TO PREVENTION OF DIABETIC RETINOPATHY (SYSTEMATIC DIAGNOSIS AND TREATMENT OF DIABETIC RETINOPATHY)

Key words: Diabetic Retinopathy, Preventable, Avoidable Blindness, Visual Impairment

Summary:

This work analyzes the results from the program, started in Portugal in 2010, with the purpose of prevention of blindness and visual impairment resulting from diabetic retinopathy, i.e., Systematic Diagnosis and Treatment of Diabetic Retinopathy. Researchers intended to answer the question: Are we doing everything that we should to fight Blindness and Visual Impairment?

In Portugal, there are two established programs that invest in the early detection of ocular conditions that can lead to Blindness and Moderate to Severe Visual Impairment (MSVI): The Systemic Diagnosis and Treatment of Diabetic Retinopathy (SDTDR) and Screening of Amblyopia Risk in Children between 2 and 4 years. Regarding the first program, the researchers analyze the data from 2010 to 2017.

In 2017, according to the Portuguese National Health Service – Direcção Geral de Saúde (DGS), the SDTDR program achieved the best results ever with 198400 screenings, a growth of 25% compared with the previous year. Another milestone established in the program and reached in 2017 was the full coverage of Portuguese territory.

Despite the undoubted improvements reached by the program in seven years, the researchers found that the program just satisfied around 50% of the needs, regarding the screening part of the program, which is considerably below the initial objectives of the program. On the treatment side, the authors found that in the year 2017 there were almost 30,000 diabetic persons at risk of blindness or MSVI because of undiagnosed Diabetic retinopathy.

In conclusion, despite the considerable advances made by the program, it still is insufficient to the universal coverage of diabetics in Portugal and to the prevention and avoidance of blindness and MSVI among this specific group of patients.

ID: 00370

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

ELLEN SVARVERUD¹, VIBEKE SUNDLING¹

Affiliation:

1) University of South-Eastern Norway, National Centre for Optics, Vision and Eye Care

Presenter: Ellen Svarverud

OPTOMETRY-RELATED MINI-PROJECT PROMOTING COLLABORATIVE LEARNING AND SOCIAL INTERACTION ACROSS STUDENT COHORTS

Key words: Education, mini-project, collaborative learning, social interaction

Summary:

Content

Norwegian first-year students are introduced to optometry through a mini-project in their first week at university. Here, the students work on optometry-related topics in groups under supervision of faculty and senior students. The project period is structured and includes lectures, group work and discussion workshops. During group work the students work freely and without academic stringency. This informal way of learning gives the students the opportunity to learn about the eye and vision without the pressure of grades, and makes context for the basic science topics. With the urge from senior students for a similar project, we developed a collaboration project for the first- and second-year students, with focus on reflective practice; first-year students learnt about basic optometry, while second-year students worked on more advanced topics, performed measurements and supervised the first year students. The mini-project topic was axial and refractive properties of the eye and their relation to visual function.

Results

In all, 80 (85%) of first-year and 45 (69%) of second-year students voluntarily participated in the project. Measurements were obtained for both eyes for all first-year students, including visual acuity, non-cycloplegic retinoscopy, non-cycloplegic/cycloplegic autorefraction (Huvitz HRK-8000A) and ocular biometry (IOLMaster 700). The students signed a confidentiality agreement, and they gained access to their own data. All groups developed simple research questions, and gathered and assessed relevant information to support their questions. On the final day, they presented their work in an open poster session. The student responses were generally good; they found the topics to be interesting and enjoyed working with fellow students and faculty. The faculty found it stimulating to provide supervision and facilitate the students' reflections.

Recommendations/Conclusions

A project like this has logistic challenges, and requires thorough planning and dedicated faculty. Nevertheless, an optometry-related project in the first weeks of education is valuable to give the students insight in optometry, as well as to promote collaborative learning and social interaction across student cohorts and with faculty.

ID: 00374

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

JOSEPH SHOVLIN¹

Affiliation:

1) Northeastern Eye Institute Senior Optometrist

Presenter: Joseph Shovlin

LIFE THREATENING EYE SIGNS & SYMPTOMS THAT CAN'T BE MISSED

Summary:

There are several eye signs & symptoms that potentially signal life threatening events such as corneal signs of Fabry disease, impending stroke, flashing lights that neurologic or vascular sequellae to name a few. This presentation shares real case reports on patients seen in this clinician's practice.

ID: 00378

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

EMMANOUIL BLAVAKIS¹, JENNY SPAHO^{1,2}, ANGELIKI GLENI¹, EMMANOUIL KTISTAKIS¹, MILTIADES TSILIMBARIS¹, SOTIRIS PLAINIS^{1,2}

Affiliation:

1) Laboratory of Optics and Vision (LOV), School of Medicine, University of Crete 2) Optical House, Heraklion, Crete, Greece

Presenter: Sotiris Plainis

DICHOPTIC TRAINING OF BINOCULAR VISION IN AMBLYOPIA: A SERIES OF CASES USING A VIRTUAL REALITY SYSTEM

Key words: dichoptic training, binocular vision, VR system, amblyopia

Summary:

The classical approach for the treatment of amblyopia includes the correction of any refractive error and patching of the fellow eye in order to force the use of the amblyopic eye. The method of dichoptic training, aiming in the participation of both eyes in vision achieved with the fusion of two separate images presented simultaneously to each eye, has recently shown positive results in the treatment of amblyopia.

Content

The aim of this work is to demonstrate the results of a dichoptic training protocol performed in a virtual reality system in children and adults. Patients with both anisometropic and strabismic amblyopia were included regardless of their history of cover treatment.

Actions taken

Each patient attended 20 sessions, 2 to 3 times per week. The training was conducted using a special software (Vivid Vision, San Francisco, USA) and a virtual reality headset (Oculus VR). Training sessions lasted for one hour at which each patient had a measurement of their prismatic deviation and played five anti-suppression games that were also included training of his/her stereoscopic vision. Evaluation of performance before and after completion of the training was assessed with distant and near logMAR acuity, stereo-acuity as well as the P100 latency and amplitude of pattern reversal visual evoked potential (pVEPs). In addition, reading performance was evaluated using eye movements monitored with an infrared eyetracker (Eye-Link II, SR Research Ltd).

Results

Early results suggest that although not all of the patients experience an improvement in their visual acuity following training, a remarkable increase in stereoacuity was evident both in stereo-deficient patients and in those with low stereoacuity, which was supported by reduced phorias. Moreover, pVEPs showed an improvement both in the latency and amplitude of the P100 in the amblyopic eye following training. An increase in reading speed was also recorded in some cases. Finally, the vast majority of the scheduled sessions were completed, implying a better compliance of dichoptic training compared to cover treatment.

Conclusions

Dichoptic training using a virtual reality system seems to improve visual function measures in the amblyopic eye. Clinical trials are needed to evaluate the effectiveness of dichoptic training in a larger amblyopic population.

ID: 00379

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

SOTIRIS PLAINIS¹, EMMANOUIL KTISTAKIS¹, MILTIADES TSILIMBARIS¹

Affiliation:

1) Laboratory of Optics and Vision (LOV), School of Medicine, University of Crete, Heraklion, Greece

Presenter: Sotiris Plainis

EVALUATING EYE-FIXATION BASED READING PERFORMANCE IN PRESBYOPIA CORRECTION WITH CONTACT LENSES

Key words: presbyopia, contact lenses correction

Summary:

Purpose

Visual acuity provides only a partial indication of visual function in presbyopia correction. Many complaints from presbyopes originate when reading, especially under low lighting levels. Here we evaluate reading performance, based on eye fixation analysis, in a presbyopic population using contact lens (CL) correction.

Methods

Twenty seven presbyopic contact lens users (age 53 ± 5 yrs) with normal vision participated in the study. Measurements were performed binocularly with participants wearing disposable single vision CLs at baseline with both eyes corrected for far (FC) and for near (NC) with readers on top, and two weeks following correction with multifocal CLs (MC). In all conditions, single vision and multifocal 1-day Acuvue Most® (Johnson & Johnson Vision Care Inc) were used. LogMAR acuity for distance and near was measured with ETDRS charts. Reading performance was evaluated using simple paragraphs of about 140 words each (0.4 logMAR print size at 40 cm distance). Eye movements were monitored with an infrared eyetracker (Eye-Link II, SR Research Ltd). Data analysis included computation of reading speed, blink rate, fixation duration, number of fixations per word and percentage of regressions.

Results

Visual acuity at near was found statistically significantly improved in MC compared to FC condition by 0.23 ± 0.13 logMAR (from 0.31 ± 0.10 to 0.08 ± 0.09 logMAR, $p < 0.001$), but worse compared to NC condition by 0.09 ± 0.11 ($p < 0.001$). Reading speed was also statistically significantly improved on average by 47 wpm, from 198 ± 68 in FC to 245 ± 71 wpm in MC ($p = 0.001$), while it was marginally statistically significant lower ($p = 0.046$) compared to NC (264 ± 65 wpm). The improvement in reading speed with multifocal CLs (MC) compared to FC was mainly due to a decrease in the number of forward fixations from 0.88 ± 0.18 to 0.79 ± 0.15 fpw ($p = 0.008$) and in fixation duration (from 272 ± 43 to 233 ± 30 ms, $p < 0.001$). No statistically significant difference was found in any eye fixation parameter between the MC and the NC conditions. However, a statistically significant difference was found in the blink rate between the NC (5.1 ± 5.0) and the FC (7.6 ± 8.0) and the MC (8.0 ± 8.0) conditions. Finally, no correlation was found between the changes in reading speed with changes in visual acuity in any condition.

Conclusions

Reading speed improves in multifocal CL correction compared to far-corrected near vision, but is slightly reduced compared to best-corrected near vision. Fixation duration is the main parameter improved upon correction, but changes are observed also in the number of fixations and blinks, which affect reading speed. Changes in visual acuity do not predict improvements in reading speed. Evaluating reading performance using eye fixation analysis can result in a more reliable outcome of functional vision in presbyopia correction.

**study was supported with a grant from Johnson & Johnson Vision Care*

ID: 00382

Type: Oral presentation abstracts

Topic: Abstracts with an educational theme

Authors:

RUPAL LOVELL-PATEL¹

Affiliation:

1) School of Medicine, University of Central Lancashire, Preston, UK

Presenter: Rupal Lovell-Patel

IS THERE A DIFFERENCE IN LEARNING STYLES BETWEEN OPTOMETRY STUDENTS UNDERTAKING A BLENDED LEARNING COURSE COMPARED TO THOSE ON A FACE TO FACE FULL-TIME COURSE?

Key words: learning styles, optometry

Summary:

Purpose

Many of the optometry curricula still use didactic lecturing format delivered as a face to face university course. These lectures are uploaded on learning management systems as either documents or audio-recorded presentations. Do students still want to attend lectures when they can find a whole wealth of knowledge online? Is PowerPoint delivery format suitable for the modern student who has instant access to information via smartphone technology?

Methods

As part of creating a new curriculum for a blended learning optometry course, a learning styles survey was carried out amongst students within a UK university currently studying on a face to face course, two universities in Africa and applicants who applied for the new blended learning course in the UK (ethical approval was gained before the survey was deployed). Gaining an understanding of how students learn can be invaluable when creating a new curriculum in order to ensure that content developed and delivered covers all the different learning styles.

Results

91 completed surveys were analysed (49 from UK university, 10 from African universities and 32 from the blended learning course applicants). The survey used was the VARK questionnaire. The distribution of styles is as follows:

Learning Style	% of percentage of students
Visual	27%
Aural	18%
Read/wRite	15%
Kinesthetic	52%

Visual and Aural styles were slightly higher in the students on a face to face delivery course. Regardless of the mode of delivery, most students have a mixed learning style (76%) rather than just one style (24%). Reading and writing style appears to be the least preferred style of learning.

Recommendations

Optometry students learn using a variety of different learning styles, but the most recurring style is kinesthetics. This means that students who are choosing to study on an optometry course, regardless of the delivery format, prefer to learn by doing things rather than just reading, seeing or hearing the knowledge. Optometry curricula should include as much hands on clinical and practical skills teaching as well as using mixed media (recorded lectures, videos and animations/simulations) to deliver the learning.

ID: 00383

Type: Oral presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

G MARIN¹, M HERNANDEZ¹, P JORET¹

Affiliation:

1) Essilor International

Presenter: G Marin

ADVANCED VISION ACCURACY (AVA): FROM NEW REFRACTING METHOD TO NEW OPHTHALMIC LENS SOLUTION TO FACILITATE PRESCRIPTION IN INCREMENTS OF 0,01 D.

Key words: AVA eye exam, ophthalmic lens

Summary:

Purpose

To measure wearers satisfaction in real-life and market conditions with the AVA (Advanced Vision Accuracy) concept that combines the AVA eye exam, a new subjective refraction methodology using a new phoropter with an optical module producing 0.01D power steps (1° for axis), and the associated AVA lenses.

Methods

The continuously variable optical module uses a motorized deformable lens technology for sphere power associated with two motorized cylindrical lenses (fig. 1). A self-adapting staircase procedure that auto-adjust to individual subject sensitivity, with allowed “don’t know” answers, was developed to be more efficient and more comfortable for participants. We also developed new shorter “fog” and “defog” methods easier to understand by patients. An acceptance wearer test was carried out by Valencia University (Spain) to evaluate absolute satisfaction of eyeglasses wearers experiencing AVA lenses in real life and market conditions. 54 PAL and nonPAL wearers, aged from 19 to 62 (40.4±14), all ametropia ([-8D;+5.28D] for sphere; [0D;-2.31D] for cylinder) experienced an AVA eye exam at Valencia University. They selected a frame and had lenses fitting at an independent Optician. AVA lenses were ordered commercially to an Essilor lab in Germany, mounted and delivered by the optician. After a 2-weeks in-Life usage period, they went back to the University to evaluate their experience through open questions and questionnaires.

Results

On a 6 points scale from ‘Not satisfied at all’ to ‘Very satisfied’, 91% of wearers were ‘very satisfied’ and ‘satisfied’ for their overall vision, 93% for their vision sharpness and more than 80% for Adaptation, Field of vision and Far, Intermediate, Near distances vision. 87% experienced ‘very comfortable’ and ‘comfortable’ vision (6 points scale from ‘Not comfortable at all’ to ‘Very comfortable’). 98% would continue wearing AVA lenses. 96% would recommend AVA lenses to their friends or family."

Conclusion

The AVA eye exam, associating a new refraction methodology with the new optical module continuous properties, results in a more precise refraction, easier for the practitioner, for a fully reliable prescription with a more comfortable experience for the patient. Overall, wearers are highly satisfied with AVA lenses.

ID: 00450

Type: Oral presentation abstracts

Presenter: Kelly Malloy

Affiliation: Pennsylvania College of Optometry, Salus University

This presentation will focus on how to learn proper pupil testing techniques and will focus on the interpretation of results through a case-based approach. The aim is to gain an understanding of the importance of pupil testing in diagnosing multiple neuro-ophthalmic disease processes affecting both the afferent and efferent visual system.

ID: 00282

Type: Poster presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

PETR VESELÝ¹, PAVEL BENEŠ¹, SYLVIE PETROVÁ¹, MAGDALÉNA BOČKOVÁ²

Affiliation:

1) Masaryk University, Medical Faculty, Department of optometry and orthoptics, Brno, Czech Republic 2) Saint Anne's University Hospital, Department of ophthalmology and optometry, Brno, Czech Republic

Presenter: Petr Veselý

DIGITAL AMSLER GRID AND ITS USAGE IN PRACTICE OF OPTOMETRIST

Key words: Amsler, grid, metamorphopsia, ARMD

Summary:

In our ophthalmology department, we use digital Amsler grid mostly for distinguishing of metamorphopsia in patients with wet or soft form of AMD. This instrument enables to not only find the metamorphopsia on each eye separately but also enable to follow up the metamorphopsia and observe changes after treatment with anti-VGF agents. Secondary digital Amsler grid is used also for detection of peripheral astigmatism in spectacle lenses.

ID: 00284

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

ABBASALI YEKTA¹, MEHDI KHABAZKHOOB², HASSAN HASHEMI³, HADI OSTADIMOGHADDAM⁴, JAVAD HERAVIAN SHANDIZ¹

Affiliation:

1) Department of Optometry, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran 2) Department of Medical Surgical Nursing, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran 3) Noor Research Center for Ophthalmic Epidemiology, Noor Eye Hospital, Tehran, Iran 4) Refractive Errors Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Presenter: Abbasali Yekta

ECONOMIC INEQUALITY IN UNMET REFRACTIVE ERRORS NEED IN DEPRIVED RURAL POPULATION OF IRAN: OAXACA-BLINDER DECOMPOSITION

Key words: Economic inequality, Unmet need, Oaxaca–Blinder decomposition, Rural

Summary:

Purpose

To determine economic inequality in unmet refractive errors need and its determinants in deprived rural population of Iran

Methods

In a population-based study, two villages were randomly selected from underserved villages of Iran. After selecting the participants, optometric examinations included uncorrected and corrected visual acuity, subjective and manifest refractions. Concentration index (C) was used as the measure of socioeconomic inequality in unmet need. Unmet need for glasses was determined.

Results

Of 3851 samples, 3314 participated in the study (response rate=86.05). The data of 3255 subjects were used for analysis. The value of C was -0.088 (95% CI: -0.157 to -0.020), indicating a pro-poor inequality in unmet need. The prevalence of unmet need was 11.74% (9.25 to 14.22 in the poor and 6.51% (4.96 to 8.06) in the rich with a gap of about 5% in favor of the rich ($p < 0.001$). A marked percentage of the gap was due to the explained portion ($b: 5.73$; $p: 0.031$). In the explained portion, the variable of economic status ($b: 3.48$; $p: 0.004$) and myopia ($b: 0.88$; $p: 0.031$) caused inequality in favor of the rich and against the poor, respectively. In the unexplained portion, the variables of education ($p: 0.002$) and place ($p: 0.001$) had significant effects on inequality.

Conclusions

There was a significant pro-poor economic inequality in the prevalence of unmet need in rural areas of Iran. Although part of this inequality was related to variables such as education and myopia, a major portion (two thirds) of this equality was due to the direct effect of economic inequality.

ID: 00285

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

ABBASALI YEKTA¹, HAMED MOMENI-MOGHADDAN¹, MOHAMMAD REZA SEDAGHAT², NASIM MADDAH¹, HADI OSTADIMOGHADDAM³, JAVAD HERAVIAN SHANDIZ¹, ABBAS AZIMI KHORASANI³, MEHDI KHABAZKHOOB⁴

Affiliation:

1) Department of Optometry, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran 2) Sedaghat Eye Clinic, Mashhad, Iran 3) Refractive Errors Research Center, Mashhad University of Medical Sciences, Mashhad, Iran 4) Noor Research Center for Ophthalmic Epidemiology, Noor Eye Hospital, Tehran, Iran

Presenter: Abbasali Yekta

COMPARISON OF THE EARLY CHANGES OF CORNEAL BIOMECHANICAL PROPERTIES AFTER PHOTOREFRACTIVE KERATECTOMY AND SMALL INCISION LENTICULE EXTRACTION

Key words: Corneal biomechanics, SMILE, PRK

Summary:

Purpose

To compare the short-term changes of corneal biomechanical properties after photorefractive keratectomy (PRK) and small incision lenticule extraction (SMILE).

Methods

This study included a total of 124 eyes that received myopic PRK (n=62 eyes) and SMILE (n=62 eyes), respectively. Along with Scheimplfug corneal tomography with Pentacam HR, corneal biomechanical parameters were evaluated using CorVis ST and Ocular Response Analyzer (ORA) before and two weeks after surgery. Main outcome measures were dynamic corneal response (DCR) parameters with CorVis ST, corneal hysteresis (CH), and corneal resistance factor (CRF) with ORA.

Results

There was significant reduction in corneal stiffness parameter at the first applanation (SPA1) and Ambrósio's relational thickness to the horizontal profile, and increase in deformation amplitude ratio (DAR), integrated radius (IR), corvis biomechanical index (CBI) and tomographical/biomechanical index (TBI) in both groups, IR, after surgery ($P < 0.001$). Changes in DAR and IR were significantly greater in SMILE than PRK group. ($P < 0.001$), while changes in TBI was higher in the PRK group ($P = 0.005$). CH and CRF decreased in both SMILE and PRK groups after surgery, ($P < 0.001$) with a greater reduction of CH in PRK than in SMILE group ($P < 0.001$), while there was no significant difference in CRF changes between the two groups ($P = 0.128$).

Conclusions

Both SMILE and PRK caused significant short-term changes in the corneal biomechanical properties. Long-term evaluations provides a better insight into the corneal biomechanical behavior following these two corneal refractive surgery techniques.

ID: 00289

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

JONATHAN SHAPIRO¹

Affiliation:

1) Shapiro Optometrist Ltd

Presenter: Jonathan Shapiro

PROVISION OF VISION CARE IN UNDER-DEVELOPED ENVIRONMENTS

Key words: Vision correction, Under-developed environment

Summary:

According to the World Health Organization there are about 1 billion people without adequate vision care. Provision of vision care in under-developed environments should include determining the prescription and the immediate supply of spectacles. There should be a repair facility. The examination and provision of the glasses should be possible in unfavourable conditions and at a reasonable price. The labour needed, and the related education required, plus the production of materials should encourage a home-grown service. This will lead to the establishment of a professional service.

Although some NGOs are setting up self-sustaining services, in many cases help provided from outside fails to create an immediate and continuing solution for the patient's needs. This lecture shows the need for treatment, a brief discussion of services being provided, and a proposal for improvement in facilitating the examination, production and the development of optometric care.

The proposed system will require field research to verify the claims made, and the viability of implementing it in the specific environment. If the proposed system is proven to be reliable, and financially viable, an industry can be created for the indigenous supply of vision care at a suitable cost to the patient.

ID: 00297

Type: Poster presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

PAVEL BENEŠ¹, SYLVIE PETROVÁ¹

Affiliation:

1) Masaryk University, Department of Optometry and Orthoptics

Presenter: Pavel Beneš

HYBRID CONTACT LENSES IN HIGH ASTIGMATISM CORRECTION

Key words: astigmatism, refractive error, hybrid contact lens, visual acuity

Summary:

Case presentation

The aim of this paper is to present advantages of hybrid contact lenses (HCL) used in cases of high astigmatism correction. These lenses are made from two materials – hard in the centre and soft in the periphery (skirt). Their properties are as follows: provide good visual quality, comfort during wearing and optical stability. Hybrid lenses can be fitted in cases of keratoconus correction and at other corneal ectasias. We can use them also in patients after keratoplasty or in clients intolerating wearing of RGPs.

Actions taken

Nowadays we can include in our practice over hundred respondents. To determine the objective refraction the autorefraktometer with Placido disc was used and the values of spherical and astigmatic correction components, including the axis were recorded. Followed by Easygraph corneal topography and slit lamp evaluation. These measurements were subsequently subjectively verified and clients were fitted/tested with the trial hybrid contact lenses: **Duette** (siliconehydrogel skirt) or **SynergEyes A** (hydrogel skirt). Diagnostic fitting is essential to evaluate proper fit. There are differences in fitting in regular and irregular corneas.

For clients with high level of astigmatism is important to adapt for the each lens depending on the corneal characteristics. Visual acuity improved with HCL in all cases to satisfactory level against previously worn soft or RGP lenses.

Conclusion

Hybrid contact lenses seems to be the best possible corrective aid in clients with high astigmatism. We can register very good results especially in improvement of visual acuity where some clients are able to read Snellen 1,2 (decimal). These lenses are also alternative in cases where soft toric contact lenses or RGPs are not tolerated by the client or the correction is not stable. For fitting assessment is important evaluate post lens tear film that keeps ocular health and maintain corneal integrity. This help in clients' rapid return to everyday personal and social life.

ID: 00300

Type: Poster presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

MATJAŽ MIHELČIČ¹

Affiliation:

1) Optika Mesec

Presenter: Matjaž Mihelčič

MEASURING CORNEAL TOUCH SENSITIVITY

Key words: Cornea, Corneal Sensitivity, Esthesiometer,

Summary:

Content

Corneal touch sensitivity represents the most important neural protective mechanism of the eye. Measuring it, gives important indicators of corneal physiology, especially in the diagnostics of corneal and systemic diseases (e.g. dry eye syndrome, herpetic keratitis, corneal dystrophies, diabetes) and recovery from ocular surgery. There are however some obstacles in measuring this property of the human body: on one hand, the corneal nerve plexus is a very complex one, unevenly distributed and beside containing nerves sensitive to touch, it contains also those which respond to other modalities of stimulation. On the other hand, devices for measuring touch sensitivity are either complicated and not suitable for daily practice, or they are simple, yet not very quantitative, reproducible or accurate.

Actions taken

Several devices with their principles for measuring corneal touch sensitivity were theoretically compared, then the Cochet-Bonnet monofilament esthesiometer was used to measure central corneal touch sensitivity of subjects with and without corneal pathology in a trial (Ethical committee approval was obtained). For comparison, the subjective touch sensitivity to the measurement of Intraocular pressure with the handheld tonometer Icare ic100 was made; it was shown, that hyposensitive patients do not sense the touch of the probe at all and that the principle of rebound tonometry might well be used for testing corneal touch sensitivity.

Recommendations / Conclusions

In patients with various types of pathology, it is very informative, if we know the touch sensitivity of the cornea. It helps in explaining e.g. corneal lesions of unknown aetiology, tells the acute / chronic condition in dry eye and suggests recovery stage after corneal transplants. Higher than average corneal touch sensitivity is explanatory for poor contact lens tolerance and can be used in explaining the poor adaptation phase in some patients. On the other hand, one should be extra cautious in prescribing contact lenses to individuals with decreased touch sensitivity due to increased risk of corneal erosion and infection.

ID: 00306

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

GATIS IKAUNIEKS¹, LIENE ANDERSONE¹, GUNTA KRŪMIŅA¹

Affiliation:

1) Faculty of Physics, Mathematics and Optometry, Department of Optometry and Vision Science, University of Latvia

Presenter: Gatis Ikaunieks

INFLUENCE OF THE BLUE LIGHT BLOCKING LENSES ON THE RETINAL STRAYLIGHT

Key words: Spectacle lenses, retinal straylight, blue light

Summary:

Purpose

Yellow tinted lenses are sometimes offered for improvement of visual quality. These lenses reduce amount of blue light, therefore, it is considered that yellow lenses decrease scattered light level in the eye (retinal straylight). However, some researches show that yellow tinted lenses do not decrease light scattering in the eye (Os et al., 2017). There are also untinted lenses, which reduce amount of transmitted blue light. These blue blocking lenses have the special antireflecting coating, which reflects large amount of falling blue light. The aim of this research was to test whether untinted blue blocking lenses reduce retinal straylight.

Methods

Straylight meter (C-Quant, Oculus Optikgerate GmbH) was used for retinal straylight measurements. The measurements were performed in four conditions: without spectacle lens in front of the eye; using plano lens without the antireflecting (AR) coating; using lens with the blue light filtering coating and using a yellow tinted lens without AR coating. Measurements were done for 37 subjects (average age 22 ± 1.30 years).

Results

Results showed that straylight parameter S was not significantly different between ($p > 0.05$) measurements done without a lens ($\log S = 0.90 \pm 0.02$ (SE)), looking through an uncoated lens ($\log S = 0.92 \pm 0.02$) and blue light filtering coatings ($\log S = 0.92 \pm 0.02$). The yellow tinted lens significantly increased the retinal straylight ($\log S = 0.96 \pm 0.02$) in comparison to other conditions ($p < 0.01$).

Conclusions

Results showed that clear spectacle lenses without the AR coating do not significantly affect the retinal straylight level. Data also show that it is not possible to significantly reduce light scattering in the eye with special coated or yellow tinted lenses.

ID: 00307

Type: Poster presentation abstracts

Topic: Abstracts with an educational theme

Authors:

ROBERT ANDERSSON¹, MELISSA VITEK¹

Affiliation:

1) Salus University

Presenter: Prof. Robert Andersson

CLINICAL COMPETENCY OUTCOMES OF PATIENT-CENTERED SUPPLEMENTAL EDUCATION FOR FINNISH STUDENTS STUDYING IN THE UNITED STATES

Key words: patient-centered education, optometry, BSc degree program, supplemental program

Summary:

Salus University provides Oulu University, Oamk (OU) optometry students an annual patient-centered education to supplement OU's education program. Salus University provides this two-week long educational program for Oulu University of Applied Sciences students who are completing studies in the final year of their BSc degree program.

This survey study includes the statistical analysis of sixteen Oulu University students participating in the Salus University supplemental program who were willing to participate in the survey study in the fall of 2018. Participation was voluntary, and a consent statement was presented to each participating student. Responses were anonymous, and the institutional review board (IRB) at Salus University approved the study as an IRB exempt research project.

Methods

Data collection process: A clinical instructor for Salus University collected data at the University's clinical skills facility during controlled patient care sessions.

Data analyses: Descriptive and analytical (Wilcoxon signed-rank tests) statistical analyses were conducted for evaluating and monitoring students' clinical skills competency levels on a Likert scale of 1-5 (1 being the worst and 5 being best).

Results and discussion

The results for the following questions had statistically significant increases from pre to post evaluations.

Students – Instructor: The following pre-assessments differed significantly between student and instructor: Examination/Technical skills: Anterior segment Assessment ($p=0.046$, student higher); Examination/Technical skills: Posterior segment assessment ($p=0.01$, instructor higher); Correlating data: Knowledgebase ($p=0.002$, student higher), and Assessing data: Formulating diagnoses QA6 ($p=0.01$, student higher). The following post-assessment differed significantly between student and instructor: Examination/Technical skills: Anterior segment assessment ($p=0.001$, student higher).

Recommendations and conclusions

The survey study indicates that the combination of intensive lecture and hands-on clinical education produces favorable learning outcomes for the students participating in this supplemental program.

ID: 00309

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

LAURA CLAVÉ¹, MARÍA S. MILLÁN², AURORA TORRENTS²

Affiliation:

1) Hospital de Mataró, servicio de oftalmología. Consorci Sanitari del Maresme 2) Grupo de Óptica Aplicada y Procesado de Imagen, Departamento de Óptica y Optometría, Universitat Politècnica de Catalunya-BARCELONATECH

Presenter: Laura Clavé

COMPARISON OF TWO METHODS FOR MEASURING VISUAL ACUITY AT DIFFERENT DISTANCES

Key words: visual acuity, optotypes, defocus curve

Summary:

Purpose

According to the de U.S. Food and Drug Administration, defocus curves should be obtained by measuring the visual acuity (VA) between +1,50D and -2,50D in 0,5D defocus steps. Theoretically, these measurements could be taken by placing physically the optotype either at far or at near distance from the subject and adding a series of spectacle lenses to cover the required defocus range. In this work, we will compare distance and near VA values by two methods: one, using the standard procedure that places the optotype at far distance and two, placing the optotype at a near distance. With each configuration, we measure the VA at two representative points of a defocus curve: the best corrected distance VA and the near VA.

Methods

Two optotypes have been used for the assessment of VA: one designed for testing at 3,5m and another at 33cm following the Bailey and Lovie criteria. Landolt rings were used as a stimulus. We assessed 31 subjects (23,06±5,11 years) with accommodation preserved. The test was performed monocularly with the best 3,5m distance correction. Four series of VA measurements were taken (Table 1)

Results

When distance VA was evaluated, simulated far vision values were 5 lines VA worse than those obtained with natural far vision (SFVA=0,07±0,12, NFVA=-0,10±0,06). In near vision, VA obtained by simulating object distance with minus lenses was slightly better than VA obtained with natural near vision (SNVA=-0,02±0,09, NNVA=0,02±0,06). With the optotype at 3,5m, we have measured very good VAs (down to -0,3 LogMAR), but we have not obtained such good VAs with the optotype at 33cm (>=0 logMAR). We consider two possible reasons to explain these results: the limited resolution of the printer for the optotype placed at 33cm and the crowding effect.

Conclusion

The two configurations studied to measure VA, although hypothetically equivalent, do not give the same results in practice. With the optotype placed at 3,5m from the subject, VA outcomes reach higher VA values, for both the far and near assessments, than with the optotype at 33cm. To conclude, the configuration with the optotype at far distance allows more precise VA measurements.

ID: 00318

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

GUNTA KRUMINA¹, ELIZABETE STRAUTA¹, VSEVOLOD LYAKHOVETSKII²

Affiliation:

1) University of Latvia, Faculty of Physics, Mathematics and Optometry, Department of Optometry and Vision Science 2) Russian Academy of Sciences, Pavlov Institute of Physiology

Presenter: Gunta Krumina

THE DEVELOPMENT OF ANAGLYPH GLOBAL METHOD FOR DETERMINATION OF STEREOANOMALY

Key words: Crossed-disparity, uncrossed-disparity, stereothreshold, time

Summary:

The stereotest can consist of three kinds of disparity – zero, crossed, and uncrossed disparity. Stereoanomaly is a condition where the subject cannot distinguish one or two of three types of disparities. For example, the crossed disparity is normal, while uncrossed disparity is changed and *vice versa*. Richards (1970) was one of the first scientists who researched stereoanomaly. Using a local stereotest with display duration – 80ms, he concluded that 30% of people have stereoanomaly. After his work, many researchers continued the studies to find out the prevalence of stereoanomaly in general population. Jones (1977), using a local stereotest, tested vergence eye movements for stereoanomalous individuals. He concluded that the incorrect vergence eye movement is associated with stereoanomaly. There are different kinds of global stereotests used in research. In the clinic, the most popular test is TNO stereotest. In research, the most used global stereotests are the anaglyph or polarized random dot stereograms. There is still no research that has proven whether stereoanomaly also occurs testing the fine disparity.

The purpose of our study was to develop the new global stereotest and to evaluate how many stereoanomalous subjects are in our population using this new global stereotest with the possibility to change the time limit and the disparity size.

In our study, the global stereotest consists of the red-green random dots and there are no monocular cues for stereoblind subjects. The test generates stimuli with different disparities, and we use the staircase method principle for the evaluation of stereothreshold. Stimuli duration was with the restricted and with the unlimited presentation time. We compared our results with the standard TNO stereotest performed at 40cm using red-green glasses. In our pilot study, the first results have revealed that using display time less than 200ms subjects struggle to see the stimuli. In our results of 55 subjects – 17 subjects had single disparity stereoanomaly. Using our new stereotest participants showed better results than with TNO stereotest.

In conclusion, taking into consideration the recent pilot study – the display duration time will change and subjects' stereoacuity will be measured depending on time.

Acknowledgment:

The study is supported by the University of Latvia and the University of Latvia Foundation project No 2184.

ID: 00319

Type: Poster presentation abstracts

Topic: Abstracts with a clinical theme

Authors:

JEFFREY WEAVER^{1,2}, NIAL FARNON², ERIN BROOKS¹

Affiliation:

1) University of Missouri - St. Louis 2) University of the West Indies

Presenter: Jeffrey L. Weaver

DIVERGENCE INSUFFICIENCY: EVEN MORE ELUSIVE IF WE DON'T LOOK

Key words: Binocular Vision, Pediatrics, Strabismus

Summary:

Divergence Insufficiency (DI) is the least common vergence dysfunction, with a prevalence of only 0.10 percent. It has been reported that "the diagnosis of DI...tends to be elusive." However, careful assessment of binocular function, as simple as performing a vigilant cover test, may reveal more cases than have previously been reported. This case points out clues to uncovering this diagnosis, and some reasons that DI may be considered "elusive."

Case presentation

A 15-year-old white male presented for a back-to-school eye exam with no complaints. He had comprehensive exams the past 10 years with the same practitioner, who annually treated his low myopia with spectacles. Cover test was performed at each visit, recorded as orthophoria at distance and near each year. Local stereopsis was recorded as 40 seconds of arc or better on each visit. Through the years, despite equal refractive error and no pathology, the right eye was correctable to 20/20 while the left eye was only 20/25. Upon careful evaluation, the patient was determined to have a 10 prism diopter left esotropia at distance and orthophoria at near, and was diagnosed with Divergence Insufficiency.

Actions taken

The patient and parents were educated on DI, with sensitivity to the likelihood that this diagnosis had been missed for a decade. They were advised that there are few functional shortcomings, though there may be occupational restrictions as the patient enters his working years. Goals of vision therapy, including moving outward the far point of fusion, were discussed.

Recommendations

Divergence Insufficiency, especially without symptoms of diplopia, may easily be overlooked. Patients may appear cosmetically aligned and have little functional difficulty because stereopsis is present at near and monocular cues to depth are used at distance. However, optometrists owe our patients a careful assessment of binocular vision status to diagnose conditions such as DI. Careful cover testing and attention to other clues such as unexplained unequal visual acuity are critical to appropriate diagnosis prior to recommended management of the condition.

ID: 00347

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

PAUL MURPHY^{1,2}, STEPHANIE WONG^{1,5}, EDWARD LUM^{1,3}, ANIOL PLANAGUMA CORNELLA⁴, LYNDON JONES^{1,5}

Affiliation:

1) University of Waterloo, School of Optometry and Vision Science, Canada 2) Cardiff University, School of Optometry and Vision Sciences, UK 3) University of New South Wales, School of Optometry and Vision Science, Australia 4) Universitat Politècnica de Catalunya, Terrassa School of Optics and Optometry, Spain 5) Centre for Ocular Research and Education, University of Waterloo, School of Optometry and Vision Science, Canada

Presenter: Paul Murphy

IN VITRO STUDY OF SURFACE TEMPERATURE CHANGES IN SOFT CONTACT LENSES UNDERGOING FORCED HEATING

Key words: contact lenses, evaporation, lens temperature

Summary:

Purpose

During silicone hydrogel (SH) contact lens (CL) wear, the lens core is heated by the eye, while the surface is affected by pre-lens tear instability. Overall, a gradual loss of water content (WC) through evaporation is observed, which may influence CL comfort. Previous work has shown that material type and WC moderate the heating/evaporation/water loss effects. To further investigate these effects, this study investigated the impact of forced heating on two SH CLs of similar WC.

Methods

The change in surface temperature (ST) at the geometric centre of two SH CLs (narafilecon A, 1-DAY ACUVUE TruEye, 46% WC; comfilecon A, Biofinity, 48% WC) was measured using an infrared thermal camera (FLIR A655sc). Each CL (-3.00D) adapted to ambient temperature (25-26°C) and humidity (39-42%) prior to placement on a heated model eye (33.2±0.6°C) for 30 mins (N=5 for each). The matte black model eye consisted of a mini-scleral lens (7.70mm BOZR) overlying a 20mm diameter heated dome. Measurements over time and between CL types were compared using repeated measures ANOVA and post-hoc Games-Howell test.

Results

Significant changes in ST occurred for both CLs ($p < 0.001$) during the 30 min study period, in four phases: (i) Both CLs underwent rapid warming, from room temperature, upon initial placement on the model eye; (ii) ST gradually cooled on both CLs due to water evaporation from the CL surface. The rate of ST cooling was faster with narafilecon (-1.64°C/min) than with comfilecon (-0.96°C/min) ($p = 0.008$); (iii) Upon reaching minimum ST, a short stabilisation period (median (IQR)) followed: narafilecon: 3.00 (1.25) mins, comfilecon: 6.67 (2.50) mins ($p = 0.008$). (iv) Thereafter, ST increased slower with narafilecon (+0.22°C/min) than comfilecon: (+0.40°C/min) ($p = 0.008$) for narafilecon: 24.50 (1.41) mins, comfilecon: for 18.83 (3.34) mins ($p = 0.008$).

Conclusions

1) Initial rapid heating occurs when CLs were first placed on the model eye; 2) short period of surface evaporation produces a decrease in CL ST; 3) comfilecon has a longer period of ST stabilisation than narafilecon; 3) comfilecon shows a faster rate of warming after ST stabilisation, as lens WC decreases; 4) this pattern of ST change likely reflects fundamental differences in lens material chemistry.

ID: 00360

Type: Poster presentation abstracts

Topic: Abstracts with a research-led theme

Authors:

SANTIAGO ESCANDÓN GARCÍA¹, JOSÉ MANUEL GONZÁLEZ MÉIJOME¹

Affiliation:

1) UNIVERSITY OF MINHO

Presenter: Santiago Escandón García

VISUAL PERFORMANCE, EFFECT OF GLARE AND BINOCULAR SUMMATION WITH MONOFOCAL, EDOF AND TRIFOCAL TORIC IOLS: PILOT STUDY

Key words: Light distortion, Dysphotopsia, Pseudophakia, Intraocular lens.

Summary:

Purpose

To evaluate the role of residual refractive errors in visual performance under dim-light conditions in pseudophakic patients implanted with toric intraocular lenses (IOLs).

Methods

Thirty-eight eyes of 22 patients were implanted with toric IOLs (monofocal Precizon, EDoF Symphony and trifocal FineVision), 17 of them bilaterally. Distance visual acuity was measured under photopic conditions and contrast sensitivity was measured without and with glare. Light disturbances were evaluated low illumination conditions with the Light Distortion Analyzer (University of Minho, Portugal). Subjective quality of vision was also assessed with the Quality of Vision (QoV) questionnaire.

Results

Post-surgical refraction was significantly higher in the monofocal group ($p=0.020$), though the differences are barely clinically relevant. UCVA and BCVA were comparable among all groups. Near vision performance was significantly better with the trifocal lens ($p=0.048$). There was a statistically significant difference in logMAR visual acuity for intermediate vergences ($-1.50\text{D}/67\text{cm}$, $p=0.001$ and $-2.00\text{D}/50\text{cm}$, $p<0.001$) and near vergences ($-2.50\text{D}/40\text{cm}$, $p=0.001$ and $-3.00\text{D}/33\text{cm}$, $p<0.001$). The binocular light distortion index was comparable between the 3 IOLs. The QoV scores were significantly better with the monofocal lens, especially in frequency and bothersome scores.

Conclusions

Multifocal IOLs (EDoF and trifocal) resulted in worsening quality of vision symptoms when compared to the aspheric monofocal IOL. Monocular disturbance was stronger in the EDoF IOL group but binocular summation effect was also higher in order to attenuate the binocular dysphotopic perception.

ID: 00377

Type: Poster presentation abstracts

Topic: Abstracts with an educational theme

Authors:

BEN BACKUS^{1,2}

Affiliation:

1) Vivid Vision Inc., San Francisco, California, USA 2) SUNY College of Optometry, New York, USA

Presenter: Ben Backus

EXCITING CHANGES IN VISUAL FIELD TESTING

Key words: Perimetry, visual field, virtual reality, glaucoma

Summary:

Content

Conventional VF tests are given exclusively in clinical settings, using bulky, high precision equipment. However, inexpensive consumer-grade devices, especially tablet computers and virtual reality headsets, can produce good VF test results. These mobile devices can be used in the field or at home. Home testing is particularly interesting for monitoring vision in patients with conditions such as glaucoma. A common question doctors ask about any new VF test is “How long does it take?” A short test duration is important for screening, but much less important for monitoring fields at home. In fact, better precision *requires* collecting more data, which requires additional test time. Will patients comply? The answer appears to be yes. Patients do not enjoy conventional VF tests, which are experienced as fatiguing. However, tests can be made easier to take, which translates directly to additional data and better patient care. Strategies to make tests easier to take draw on eye movement physiology, psychophysics, and computer gaming.

Results

More than a dozen efforts are underway around the world to implement high quality perimetry on mobile devices. We categorize these efforts along several dimensions, including: hardware, use of eye tracking, expected cost, stimulus type, how responses are collected from the testee, readiness for market, and clinical trials status. Conventional tests offer many benefits, including good continuity of care, so conventional tests will continue to be useful. At the same time, machine learning makes it more feasible to introduce new tests that supplement conventional perimetry.

Conclusions

New visual field tests will be inexpensive, precise, and more pleasant for the test-taker. These changes will have a dramatic impact on screening, treatment, and clinical trial durations.