SOPTI Meeting 2024: Abstracts

The 18th National Conference of the Italian Optometric Association (SOPTI) was held in Riccione on April 14–15, 2024. The title of the conference was "*Focus on Errors, Unexpected Events and Complications*", and it was structured into three thematic sessions. The conference was organised by Gabriele Civiero and the programme featured a diverse array of activities, including lectures, workshops, a photo competition, and a poster session. The keynote speaker, Dr Matjaž Mihelčič (ECOO Past President), delivered a lecture about "*How to Manage Non-Adaptation to Ophthalmic Lenses*". The abstracts of the accepted posters and free papers are presented in this collection.

Comparison between optometric measurements and subjective satisfaction after photobiomodulation for dry age-related macular degeneration

Bianca Marini,[1] Virginia De Marco,[1] Andrea Bedei,[2] Laura Boccardo[1,3]

[1] Department of Optics and Optometry, University of Florence, Italy

[2] Eye Clinic Pietrasanta, Lucca, Italy

[3] Institute for Research and Studies in Optics and Optometry (IRSOO), Vinci, Italy

Abstract
Maculopathy is a degenerative disease of the retina that causes irreversible and profound vision loss, primarily affecting central vision in individuals over 60 years of age. Age-related macular degeneration (AMD) can present in two main forms: exudative (wet) and atrophic (dry). Photobiomodulation involves the use of light from the visible spectrum to near-infrared (NIR) (500–1000 nm), produced by laser or non-coherent light sources such as light-emitting diodes (LEDs) applied to the body to produce beneficial cellular effects. The treatment is performed in an eye clinic using the Valeda Light Delivery System (LumiThera). It lasts about 4 minutes and can be administered to one eye or both consecutively and it consists of nine sessions over 30–45 days, which can then be repeated after 6 months.

The purpose of this study is to evaluate the correlation between visual functions, such as visual acuity and contrast sensitivity, and the degree of subjective satisfaction in patients undergoing photobiomodulation therapy for dry AMD.

To assess the visual performance of each patient, data on visual acuity and contrast sensitivity were collected both pre- and post-treatment. One month after treatment, patients were asked to evaluate their overall visual improvement in daily life, compared to their initial condition, on a scale from 0 (no perceived improvement or even worsening compared to before treatment) to 10 (significant improvement). Each patient was treated using the Valeda Light Delivery System, through transconjunctival irradiation.

The study was conducted on 43 patients (34 females) aged between 56 and 91 years (median 81). Results from the one-month follow-up visit revealed an average improvement in best-corrected visual acuity from 0.28 ± 0.22 to 0.24 ± 0.22 LogMAR (*t*-test, $p < 0.001$) and in contrast sensitivity from 0.94 ± 0.38 to 1.06 ± 0.38 LogSC (*t*-test, $p < 0.001$). The average score of the questionnaire was 3.49 ± 2.80. Analysis of the results indicates a weak correlation between optometric measurements and subjective evaluations.

The average improvement in visual acuity is statistically significant but clinically negligible, whereas the improvement in contrast sensitivity, although small, can be considered clinically significant. These improvements are poorly correlated with the subjective satisfaction rating provided by the patients. Therefore, for a comprehensive assessment of the treatment, it is important to evaluate the patient's subjective satisfaction, integrating psychometric measures with subjective evaluations.

The role of reading in childhood: relationship between visual skills, gender and age

Irene Catena, Marina Serio, Silvio Maffioletti

Department of Optics and Optometry, University of Torino, Italy

Abstract
The visual system is subjected to great demands for both close and distant tasks from an early age, and taking care of it and acting promptly to remedy any problems is vital for a child's overall wellbeing. In paediatric optometry, the collaboration between the eye specialist and the teacher plays a fundamental role in the early detection of vision-related disorders.

With this thesis we aim to investigate the role of visual skills in the process of reading and similar tasks, differentiating the sample by gender and age. This research considers a sample of 40 children at the beginning of their school career, specifically 20 second grade (average age 7.2 ± 0.8 years) and 20 third grade (average age 8.3 ± 0.6 years) children. Each child underwent a screening, consisting of several tests, to assess visual acuity, the quality of binocular vision and the efficiency of visual skills during one of the most important phases of schooling: learning to read and write. Previous studies examined the correlations between optometric variables and visual research tests and with this thesis we want to compare their results.

Specifically, the three macro-areas investigated by the tests carried out were: visual tracking with the Groffman test; the recognition of a figure with the interference of the crowding phenomenon with the BReViS test; the evaluation by means of the DEM test of speed and accuracy in the execution of a task similar to reading but with numerical symbols, which proposes to correlate reading skills with a sustained level of attention, recognition and naming of numbers and a correct orientation of Visual Spatial Attention. It was verified that visual skills influence the test results mainly in terms of errors differently for the two ages, while no differences were found in terms of gender.

Validation of a questionnaire for assessing visual function in cataract and refractive surgery patients

Virginia De Marco,[1] Bianca Marini,[1] Andrea Bedei,[2] Laura Boccardo[1,3]

[1] Department of Optics and Optometry, University of Florence, Italy

[2] Eye Clinic Pietrasanta, Lucca, Italy

[3] Institute for Research and Studies in Optics and Optometry (IRSOO), Vinci, Italy

Abstract
Cataract and refractive surgeries are increasingly common and continuously evolving procedures, highlighting the need for studies that assess their effectiveness and impact on patients' lives. In

this context, psychometric questionnaires are a key tool for describing visual abilities and vision-related quality of life, providing healthcare professionals with valuable data to improve treatments. The psychological impact of these interventions is important, as the primary goal is to ensure that the patient experiences improved vision compared to their previous condition, offering not only functional benefits but also perceptual and psychological advantages. This study aims to evaluate the validity of a self-assessment questionnaire on vision quality following these two types of interventions.

Demographic and refractive data were collected from patients at an eye clinic in Pietrasanta (Lucca). Refractive data, along with uncorrected visual acuity (UCVA) and best-corrected visual acuity (BCVA), were recorded both before and after surgery. During the follow-up visit, patients completed a psychometric self-assessment questionnaire on visual function and perceived improvement following cataract or refractive surgery. The questionnaire was developed by one of the authors to internally monitor patient satisfaction with the procedures performed at his clinic. It focuses on assessing the patient's visual function and is completed during the postoperative check-up. The questionnaire consists of 11 questions, each referring to everyday activities. For each question, five levels describe the patient's perception of their vision while performing the listed activities, with each level corresponding to a specific score.

The study was conducted on 102 patients (71 females), of whom 80 had cataract surgery, 11 had FemtoLASIK, six had PRK treatment, two had SMILE treatment and three had phakic IOL implantation for refractive purposes. Age ranged from 21 to 93 years (median 72). After surgery, UCVA and BCVA were 0.12 ± 0.18 and 0.05 ± 0.09 LogMAR, respectively. The mean improvement of UCVA and BCVA was 0.62 ± 0.41 and 0.30 ± 0.26 LogMAR, respectively. The questionnaire score showed a median value of 3.7 (range 1.8–4.0) on a scale of 0 to 4 (see Figure 1). Regarding the Rash analysis, the reliability index of the questions is good (0.92) while that of the subjects is low (0.49); the separation index between the items is good (3.42) while for the subjects it is low (0.99).

The patients are highly satisfied with the results of the intervention, achieving good scores across all activities tested in the questionnaire. Data analysis shows no clinically significant correlation between visual acuity and the questionnaire scores, which may be due to the clustering of scores at very high levels. To continue with the validation of the questionnaire, it will be necessary to include a sample with greater variability in responses, by administering the questionnaire both before and after the intervention, and by testing for repeatability.

Factors affecting pupil diameter

Francesco Adami,[1] Laura Boccardo[1,2]

[1] Department of Optics and Optometry, University of Florence, Italy

[2] Institute for Research and Studies in Optics and Optometry (IRSOO), Vinci, Italy

Abstract
Understanding pupil size is highly relevant in refractive surgery, multifocal contact lens fitting, and orthokeratology. The purpose of this study is to evaluate the factors that may affect pupil size, such as light conditions (photopic, mesopic, and scotopic), refractive error, light sensitivity, eye colour, corneal diameter, and axial length.

WAM 5500 Open Field Binocular Autorefractometer (Grand Seiko) and Osiris-T Aberrometer (CSO) were used to measure objective refraction. Lenstar 900 biometer (Haag-Streit) was used for axial length measurement. Light sensitivity measurement was performed with Lumiz 100 (Essilor). Pupillary and corneal diameters were measured with the Osiris-T topographer (CSO). All examinations were performed without refractive correction.

The sample included 64 subjects, equally divided between males and females, aged 19 to 52 years (mean 26.5). The results show that luminance is the factor that mostly affects pupillary diameter. The mean pupillary diameter of the sample was: 3.96 ± 0.83 mm in photopic condition, 5.03 ± 0.94 mm in mesopic condition, and 6.12 ± 0.81 mm in scotopic condition (ANOVA: P < 0.001). There is evidence of a decrease in pupillary diameter as age increases, and this correlation, although moderate, is statistically significant ($R = -0.36$, $p < 0.05$). The sample was composed of 30 myopic subjects (< -0.50 D), 28 emmetropic subjects, and 11 hyperopic subjects (> +0.75 D). At low luminance levels, myopes tend to have larger pupils (mesopic: 5.41 mm; scotopic: 6.42 mm) than hyperopes (mesopic: 4.77 mm; scotopic: 5.85 mm) ($p < 0.05$). The difference was not statistically significant at the photopic level. In our sample, 45 subjects had dark eyes and 14 had light eyes (blue, green, or grey). No statistically significant differences in pupil diameter were found based on eye colour. In all lighting conditions, no significant correlation was observed between pupil diameter and anatomical parameters of the eye, such as axial length and corneal diameter.

Among the factors analysed, those influencing pupillary diameter are environmental luminance, age, and uncorrected refractive error. Luminance is the factor with the greatest effect. The study shows that refractive error affects pupil diameter, as subjects with hyperopia had smaller pupil diameters than those with myopia. This difference may be due to the fact that our measurements were taken without correction, thus not excluding the influence of accommodative miosis. The results indicate that the other factors examined (light sensitivity, eye colour, axial length, corneal diameter) do not affect pupil diameter.

Are online myopia calculators reliable?

Alessia Bellatorre,[1,2] Silvia Di Benedetto,[1,2] Claudia Colandrea[1,2]

[1] Department of Optics and Optometry, University of Torino, Italy

[2] Istituto Benigno Zaccagnini, Milano, Bologna, Italy

Abstract
Retrospective study comparing the evolution of myopia using two web calculators: Myopia Care Web (MCW) and Myopia Calculator BHVI (MCBHVI). The main aim is to verify the accuracy of the predictions from these tools compared to the actual results observed in a group of myopic subjects.

The studied sample includes 417 eyes of Caucasian subjects, aged between 7 and 25 years, with a maximum follow-up of 6 years. The subjects did not use specific corrections to slow down the progression of myopia, except for a group that used orthokeratology lenses. The results showed that MCW tends to overestimate myopia in 69% of cases compared to MCBHVI, with an average difference of -0.46 D. Furthermore, MCBHVI tends to underestimate myopia compared to the actual values.

The statistical analysis, performed with the Wilcoxon test, revealed a significant difference between the two calculators. The greatest discrepancy was observed in subjects with a starting age of around 11 years and initial myopia of -2.45 D. The conclusions suggest that, although the calculators may be useful for an initial indication, professionals should be cautious about basing their decisions solely on these tools, given the individual variability of risk factors.

Control of myopia progression and orthokeratology – a 10 year case study

Charles Di Benedetto

Department of Optics and Optometry, University of Florence, Italy

Abstract

Myopia has been increasing exponentially, and in recent years, many optical companies have developed and commercialised solutions for its management. Orthokeratology has been a pioneering solution for controlling myopia progression and remains one of the most effective non-pharmacological optical strategies today. This study presents a 10-year case report of a 22-year-old female myopic patient, who has been using orthokeratology lenses since she was 12.

The patient's myopia had progressed to -2.00 D when orthokeratology treatment was started in March 2014, and it has been closely monitored ever since. From November 2021, regular axial length measurements were performed to track myopia progression alongside the traditional method of spherical equivalent measurement. The contact lenses used for this patient have always been Contex OK lenses (Bausch & Lomb).

Over the 10-year period (from February 2014 to March 2024), the patient's myopia increased by -1.25 D in the right eye and -1.00 D in the left eye. Axial length increases from November 2021 to February 2024 were minimal: 0.05 mm in the right eye and 0.04 mm in the left. No complications related to visual health or eye safety were observed during this period. Throughout the years of lens use, there were no visual or ocular health complications. This was ensured by the regular follow-up appointments, which the patient consistently adhered to.

These periodic check-ups helped maintain a strong professional-patient relationship, fundamental for the success and continuity of the treatment, as well as for preventing and managing any potential complications. The patient continues to be satisfied with the treatment, engaging in sports without needing glasses or traditional contact lenses. When compared with published literature, this case shows effective long-term control of myopia, particularly given the patient's young age at the start of the treatment.

Preschool visual screening: update on guidelines and procedures

Luca Beccari, Silvia Di Benedetto, Claudia Colandrea, Stefano Spataro

Department of Optics and Optometry, University of Torino, Italy

Abstract

Visual screening at preschool age allows us to prevent visual developmental anomalies in advance, offering the possibility to intervene before problems worsen. The aim of this work is to present a worldwide survey of visual screening protocols and to compare them with a model analysed in Italy. The implementation of a visual screening programme is now of crucial importance for the public health of children. Here, we propose how to update the guidelines for the implementation of effective and efficient vision screening in our country. First, the approach and screening methods used internationally were evaluated by selecting information from 30 articles in the literature. The extrapolated data were then compared with the data collected in the present study carried out in Italy (Ottica Zoldan – Belluno in collaboration with orthoptists and ophthalmologists).

The Italian model was found to be complete in comparison with the international literature and could be implemented as a possible programme in our country. The model proves to be very reliable due to the wide range of tests covered; in fact, it shows excellent results compared to the international panorama and boasts a better preschool visual screening programme. The implementation of a visual screening programme would be very important for the public health of children today, as shown by the analysis of the 30 articles from different parts of the world. These studies found that on average 20% of children fail the screening test due to visual impairment, a figure that should not be underestimated.

Refractive errors in school age children: a study with the portable autorefractometer

Giorgia Meneghel, Allessia Bellatorre, Michela Greco

Department of Optics and Optometry, University of Torino, Italy

Abstract

The aim of this research was to investigate the visual situation in school age children through the use of a portable autorefractometer (VIVS100S-B Welch-Allyn) and analyse the incidence of refractive errors detected. The sample consisted of a group of 125 children aged between 6 and 9 years, from the primary school "Santorre di Santarosa" in Torino.

Three optometric tests were used to carry out this investigation: measurement of the refractive error using the portable autorefractometer, a tool that provides an objective estimate of the refractive defect; cover test, one of the fundamental tests for investigating the quality of binocular vision; Lang test II, useful for evaluating binocular and stereoscopic vision and identifying any early defects.

To study the reproducibility of the measurements made with the portable autorefractometer, repeated measurements were performed on a subject and compared with the data of a fixed autorefractometer.

The results obtained highlight the importance of the screening test and show the need to further study the reliability of the instrument.