Scientific Session 7: Clinical Investigation

CORNEAL IMAGING OF PATIENTS UNDER TOPICAL ANTI-GLAUCOMA MEDICATIONS

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Introduction: Corneal layer thickness measurement is important for topical anti-glaucoma Medications (AGMs) because AGMs may alter corneal layer thickness and endothelial morphology indicating corneal layer damage. The study aims to assess the corneal layer thickness and endothelial morphology among patients under topical AGMs for primary open angle glaucoma (POAG) and primary angle closure glaucoma (PACG). **Methods**: In the cross-sectional hospital-based comparative study, 37 patients (50 eyes) with POAG and 32 patients (50 eyes) with PACG under minimum one topical AGMs for at least 3 months of duration were recruited at the Tilganga Institute of Ophthalmology, Kathmandu, Nepal. The assessment included corneal epithelial mapping using anterior segment optical coherence tomography (AS-OCT) and specular microscopy for endothelial morphology. The variables included in the study are patient's age and gender, type of glaucoma, duration of treatment, number and dose of AGMs. **Results:** Epithelial thickness (ETT) was significantly reduced in POAG group ($p<0.001$, $48.40 \pm 4.55\mu m$) and PACG group ($p<0.001$; $45.60 \pm 3.27\mu m$) compared to non-glaucoma group ($54.67 \pm 2.24\mu m$). Similarly, corneal thickness (CTT) was significantly reduced in POAG group ($p<0.001$; $514.54 \pm 35.39\mu m$) and PACG group ($p<0.001$; $510.58 \pm 32.11\mu m$) compared to non-glaucoma group ($543.88 \pm 34.04\mu m$). The central stromal thickness (CST) was also significantly reduced among POAG group ($p<0.001$; $439.16 \pm 45.15\mu m$) and PACG group ($p<0.001$; $442.50 \pm 45.3\mu m$) compared to control group ($487.03 \pm 43.58\mu m$). Moreover, endothelial cell density (ECD) was significantly lower in POAG group ($p<0.001$; 2618.48 ± 313.41 cells/mm2) and PACG group ($p<0.001$; 2337.14 ± 270.91 cells/mm2) compared to control group (2810.46 ± 441.36 cells/mm2). The average ETT negatively correlated with the age of the patient ($r= -0.372$, $P < 0.001$), numbers of medications ($r= -0.218$, $p = 0.03$), duration of treatment ($r= 0.344$, $p < 0.001$), and dose of AGMs ($r= -0.2$, $p = 0.047$). **Conclusions**: In both POAG and PACG under topical AGMs, ETT, CTT, CST and ECD were lower compared to healthy eyes. Patient's age, duration of therapy, number and dose of AGMs negatively affect mostly the central and peripheral corneal epithelial zone in patients with glaucoma.

INTERPUPILLARY DISTANCE, INNER CANTHAL DISTANCE, OUTER CANTHAL DISTANCE AND CANTHAL INDEX ASSESSMENT IN THE NEPALESE POPULATION: A HOSPITAL-BASED STUDY

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Introduction: Interpupillary Distance (IPD), Inner Canthal Distance (ICD), Outer Canthal Distance (OCD) and Canthal Index (CI) are important parameters of craniofacial anthropometry and are known to rely on factors like age, gender, ethnicity, genetics and geographical distribution. These craniofacial anthropometry parameters have potential application in ophthalmic dispensing, clinical evaluation, diagnosis and treatment of congenital orbital or craniofacial anomalies, post-traumatic deformities and various systemic syndromes. This study aimed to determine IPD, ICD, OCD and CI among the adult Nepalese population and to investigate the relationship between these parameters. **Methods**: This was a hospital-based, cross-sectional study conducted among 1000 individuals of Nepalese ethnicity with an age of 18-64 years. The assessments included IPD, ICD, OCD and CI. IPD was measured using a pupillometer (G-Matronix; code-211032504) and a digital vernier caliper was used for measuring ICD and OCD. **Results:** The mean IPD for adult individuals for distance and near were 62.7 $\pm$ 4.3mm (50.1-75.2) and 58.5 $\pm$ 4.3mm (46.7-70.9) respectively while the mean ICD, OCD and CI were 32.19 $\pm$ 2.72mm (24.3-39.8), 87.82 $\pm$ 4.36mm (74.2-100.6) and 36.66 $\pm$ 2.42% (29.7-43.9) respectively. There was statistically significant difference ($p < 0.05$) between male and female and among different ethnic groups for all the measured parameters except for CI ($p = 0.185$) and OCD ($p = 0.315$) respectively. Significant correlation was observed between IPD and canthal distances. The regression estimates for calculating IPD based on OCD and ICD were, for Male: Distance IPD = -1.83 + 0.58 x OCD + 0.28 x ICD ($r^2 = 0.640$) and Near IPD = 2.63 + 0.58 x OCD + 0.29 x ICD ($r^2 = 0.550$); while for females: Distance IPD = 1.84 + 0.52 x OCD + 0.29 x ICD ($r^2 = 0.533$) and Near IPD = 2.82 + 0.54 x OCD + 0.28 x ICD ($r^2 = 0.645$). **Conclusions**: This study showed variable interpupillary distance, inner canthal distance, outer canthal distance and canthal index among different ethnicities and gender of the Nepalese population. Furthermore, the canthal distance measurements are comparable to IPD and hence it would be reliable alternative method for predicting accurate and reproducible IPD estimation.

OPTICAL MANAGEMENT OF IRREGULAR ASTIGMATISM IN POST - HERPES ZOSTER KE RATITIS (HZV)

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Background: Herpes Zoster Keratitis (HZV) is a viral infection resulting from the reactivation of the varicella-zoster virus, affecting the ophthalmic branch of the trigeminal nerve. It is typically characterized by the development of multiple painful, unilateral vesicles, and ulcerations. Ocular complications can include epithelial keratitis, leading to haze and loss of stromal tissue, which may cause irregular astigmatism in the central or paracentral corneal area. This case report discusses the optical management through orthokeratology in a patient with unilateral post-HZV followed for more than a year's time. Clinical problems: A 19 years-old male presented to the Out Patient Department of Matrika Eye Center for refractive surgery. He had a history of wearing glasses for one year, where no history of wearing any contact lens. Last eye check was done one year back when the glasses were prescribed. His vision OD was 6/36, best corrected visual acuity was 6/6P in right eye with -2.50DSPH / -1.75DCYL X 15 degrees and 6/24 in left eye with -1.50DSPH / -0.50DCYL X 5 6/6. Slit lamp examination showed corneal scar with vascularization on right eye, and other findings were normal and left eye was normal. Schirmer1 results on the right eye was 25mm @ 2 Minutes and on the left eye was 24mm @ 2 Minutes. In both eyes, fundus finding was within normal limits. **Existing solution(s) and its shortcoming:** Topography and optove were performed for monitoring and evaluation. **Clinical pearls:** Once the patient had decided to trial fitting and completed for lens order and delivery. Proper care and maintenance of the lens is essential as well as regular follow up. **Take home message:** Give justifiable time for the patients to start with a shorter period of wearing time, for example, 3 to 4 hours and gradually build up the wearing time.

OCULAR AND FACIAL PROSTHESIS- RESTORATIVE REHABILITATION

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Background: Ocular and facial prostheses play a critical role in the restorative rehabilitation of individuals who have experienced significant facial disfigurement due to trauma, infection, or disease. Advanced materials and customized fabrication techniques have greatly enhanced the functionality, comfort, and aesthetics of these prostheses. **Clinical problems:** Ready-made eye prothesis may not fit properly and causes unnecessary discomfort and recurrent visits for modification and adjustments. **Existing solutions and its shortcoming:** Customized artificial eye device can prevent mis-fit and provide long term comfort and durability. Custom ocular prostheses, typically made from medical-grade polymethyl methacrylate (PMMA), provide a tailored fit over the eye socket following enucleation or evisceration, restoring a natural appearance and improving the patient's psychological well-being. Similarly, customized scleral shells, also made from PMMA, offer a non-surgical solution for patients with phthisis bulbi, fitting comfortably over a shrunken eyeball to restore a natural look. For more extensive facial reconstruction, silicone and PMMA-based orbital prostheses offer viable options following orbital exenteration, particularly for cancer patients. These prostheses can be spectacle-mounted or integrated directly, providing essential rehabilitation without compromising comfort or safety. The use of high-quality, biocompatible materials like PMMA and silicone, combined with advanced customization techniques, ensures that these prostheses not only meet the functional needs of patients but also significantly enhance their quality of life by addressing both aesthetic and psychological concerns. **Clinical Pearls:** As technology advances, the precision, durability, and comfort of ocular and facial prostheses continue to improve, offering patients increasingly effective rehabilitation options and extending boundaries for optometrists.

PROFILE OF CUSTOM OCULAR PROSTHESIS USERS IN A TERTIARY EYE CARE CENTRE IN NEPAL

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Introduction: The ocular prosthesis, also known as 'prosthetic eye' or 'artificial eye', is a type of craniofacial prosthesis that occupies the anterior part of an anophthalmic socket and is designed to restore a lost eye due to trauma, congenital anomaly, irreparable damage, tumors or sympathetic ophthalmia, among others. Although research suggests that adjusting to life with an ocular prosthesis can happen within the first 6 months for about 40% of patients this can take 2 years or more. Prosthesis user complains of watering, discharge and discomfort with the regular use of prosthesis due to irregular surface, sharp edges and deposits over the prosthesis. **Methods**: A retrospective study was conducted at Drishti Eye Care Center, Nepal from January 2019 to June 2019. All the subjects who underwent fabrication of customized ocular prothesis were included in the study. A total of 30 subjects were included in the study. Demographic characteristics, cause for the loss of eye, laterality of lost eye, reason for opting prosthesis and the source of information for the COP was recorded from the Hospital Electronic Medical Record. Additionally, a telephonic interview was conducted with all these 30 subjects who have used the prosthesis for at least 6 months of time. A set of questions were asked to the subjects. All data were tabulated and entered in excel and analyzed with SPSS 21 version. **Results:** Mean age of subjects in the study was 31.35 ± 16.59 years (range: 1.50 years - 78 years). 46.7% (n=14) were male and 53.3% (n=16) were female. Trauma was the most common cause for the loss of eye in 43.3% (n=13) of the subjects, followed by loss since birth and some infections in the eye in 16.7% (n=5) of the subjects. **Conclusions**: There is a need of best prosthetic rehabilitation for the anophthalmic patients. Proper awareness and knowledge regarding the usefulness of custom-made prosthesis is necessary to restore the cosmesis of the face. Adequate knowledge regarding handling the prosthesis may prevent the possible complications. A better and hygienic prostheses not only beautifies the patient but also increase his/her self-confidence, hence productivity.

A CLINICAL PERSPECTIVE ON MIDDAY FOGGING OF A SCLERAL LENS

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Background: Scleral lenses are large diameter gas permeable lens that vault over the entire corneal surface and rest on the sclera. They are typically safe and effective for managing severely compromised, irregular corneas and ocular surface diseases. However, they can come with several infection, inflammation, hypoxia and fitting related potential complications which may overwhelm both the clinicians and patients. One such common issue of hypoxia-related to scleral lens wearers is midday Fogging. **Clinical problem:** Midday fogging (MDF) is when the fogging of scleral lens fog up due to accumulation of particulate debris either on the front surface of lens or in post tear-lens reservoir after minutes to hours of lens wear and when corneal oedema is present. Research suggested around 26% to 46% of scleral lens wearers experience MDF. The hallmark of MDF is the gradual disruption of vision and discomfort as particulate waste gets collected on the lens surfaces. Appearance of debris may vary from fine particulate to larger collections of yellow or brown particles or wispy clumps. Even with ideal fitting characteristics and lens care regime, fogging may still occur, which may be associated with tear film debris and chemistry, lens fit, lens material and incomplete seal. **Existing solution(s) and its shortcoming:** Midday fogging with scleral lens wear requires careful examination of ocular surface and lens fit, including tightness of the lens and tear exchange. The most commonly utilized method to avoid midday fogging is to remove the lens and refresh the filing solution either with preservative free saline or artificial tear and reapply the lens. However, frequent removal and reapplication of scleral lenses causes inconvenience to the wearers. If fogging of vision still persists, the scleral lens wearing time is reduced and the fitting relationship of the lens is evaluated and excessive edge lift is avoided. Furthermore, the possibility of corneal oedema and lens non-wetting should also be considered. Further, any inflammation on eyelids and ocular surface should be identified and treated before continuation of scleral lens. **Clinical pearls:** To understand midday fogging, one should consider several factors including lens fit, solution usage, tightness of lenses and assessments of inflammation. It should be noted that variable blur with scleral lens wear can be due to build up of debris such as tear proteins on front surface of lens or can be result of corneal oedema. It is important to evaluate the ocular surface with and without scleral lens at all pre-fitting and after-care examinations to ensure fogging of vision is not associated with any active, atopic disease or a disease that requires treatment. **Take home message:** Midday fogging is a common issue for scleral lens wearers, influenced by factors like ocular surface shape, tear film composition, and lens design. Managing MDF requires regular examination of the ocular surface and lens fit, and addressing issues such as tear film debris, lens material, and lens tightness.

Scientific Session 8: Ophthalmic Epidemiology and Diseases

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BIOMETRIC RISK FACTORS FOR EARLY ONSET PRIMARY ANGLE CLOSURE DISEASE

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Introduction: Primary angle closure glaucoma (PACG) is a leading cause of irreversible blindness worldwide, especially in Asia, where it affects about 0.75% of the adult population. Primary angle closure disease (PACD) is primarily a disease of the elderly, with a rare early-onset form known as early-onset primary angle closure disease (EOPACD). Due to its rarity, EOPACD remains a relatively less understood entity. **Purpose**: To identify the potential biometric risk factors in patients with early onset primary angle closure disease (EOPACD), likely causative for conversion of suspects to frank glaucoma. **Design**: A prospective cross-sectional observational study. **Participants**: A total of 190 eyes from 128 participants, aged 20-40 years (mean age 34.25 ± 6.02 years) diagnosed with EOPACD were included. **Methods**: EOPACD was classified into early onset primary angle closure suspect (EOPACS), early onset primary angle closure (EOPAC), and early onset primary angle closure glaucoma (EOPACG) groups. The identified participants underwent a baseline clinical examination, including gonioscopy, ultrasound biomicroscopy, anterior segment ocular coherent tomography (ASOCT) and optical biometry (IOL Master). Statistical analysis was performed to identify risk factors associated with EOPACG such as axial length (AL), lens thickness (LT), lens vault (LV), anterior chamber depth (ACD), anterior chamber area (ACA) and other parameters on ASOCT. **Main Outcome Measures**: To identify at-risk ocular biometric parameters. **Results:** Biometric measurements showed that AL was the shortest while ACD, ACA and ASOCT angle parameters were narrowest in EOPACG (p<0.001). Similarly, LV and LT were highest in eyes with EOPACG (p<0.001). Logistic regression analysis revealed that ACD exhibited the highest predictive ability (ACD≤ 2.73 mm, OR 4.36, ROC 0.72), followed by LT (LT≥4.22mm, OR 4.2, ROC 0.71) and ACA (ACA ≤17.24 mm2, OR 3.04, ROC 0.7) for EOPACG. **Conclusions**: This study highlights the significance of ocular biometric measurements, especially ACD and LT, which can assist in stratifying individuals with EOPACD for early detection of the presence of glaucoma. Monitoring individuals with EOPACD surpassing biometric cut-offs can act as an adjunctive tool for identifying individuals at risk for glaucoma.

PROFILE OF AMBLYOPIA IN PEDIATRIC PATIENTS VISITING TERTIARY EYE HOSPITAL

Sushmita Karki

Introduction: Amblyopia is the unilateral or bilateral decrease in the Best Corrected Visual Acuity caused by formvision deprivation and/or abnormal binocular interaction without any specific pathology. Amblyopia is a common visual disorder that most of the children are facing and is responsible for visual impairments. This may be due to lack of awareness, ignorance of people and lack of proper study.The main objective of our study is to determine the profile of amblyopia and outline the common types of amblyopia in children with in Tertiary Eye Hospital of Nepal with a view of providing baseline data that will guide our approach to aid early detection. **Methods**: This was a hospital-based, cross-sectional quantitative study. It was conducted at pediatric unit of Himalaya Eye Hospital Pokhara, Nepal for duration of 4 months from. The study population was patient diagnosed as amblyopia (VA ≤ 6/12 in Worse Eye) visiting pediatric eye unit with age between 5 to 16 years who were recruited after taking written consent from subjects or their guardians. Subjects with organic amblyopia, any other ocular pathology and those not willing to participate in the study were excluded. This study was conducted after taking ethical approval from the research committee of Himalaya Eye Institute and conducted in accordance with tenets of Declaration of Helsinki. All the participants underwent preliminary eye examination which included visual acuity assessment with Snellen's chart, cycloplegic (objective and subjective) refraction, slit lamp examination, fundus examination and cover test. A complete proforma with patient demographic information was collected.   **Results:** Among 1.68% of children with amblyopia 61.3% of the cases were male while 38.7% cases were female.The mean age of the patients was 8.9 ± 3.3 years. The most common form of amblyopia was refractive amblyopia 83.9%, among which isoametropic was 45.2% followed by anisometropic 38.7%, mixed 11.3%, strabismic 2.4% and stimulus deprivation 2.4% respectively. **Conclusions**: Refractive amblyopia was identified as the most common type of amblyopia. Our result highlights the importance of early diagnosis and intervention in addressing amblyopia and emphasizes the relevance of refractive correction as a critical component of amblyopia management.

ASSESSMENT OF OCULAR MORBIDITY AMONG FARMERS IN THE TERAI REGION OF NEPAL

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Introduction: Among the three main geographical regions of Nepal, the Terai region has the most fertile soil, ideal for cultivation, attracting a significant portion of the country's agricultural workforce. Despite the agricultural significance, there are many health problems, particularly concerning the eyes, that affect farmers. To understand the factors contributing to ocular health issues among Terai farmers, we need to look at allthe different reasons, like their work and the environment they're in. Spending a lot of time in tough conditions like bright sunlight, and dust, and using chemicals in farming can be tough on farmers' eyes. This study aims to discuss the prevalence and pattern of ocular morbidity among farmers in the Terai region of Nepal, including demographic data, modes of injury, and their consequences. **Methods**: This prospective study included all consecutive patients with farming or agriculture as their main occupation, presenting to the Outpatient Department of Sudarshan Eye Hospital, Gaur, Nepal. Participants underwent a comprehensive ocular examination, including refraction testing. **Results:** A total of 260 farmers were examined, of which 155 (59.62%) were male. The most common ocular morbidity was cataract (30%), followed by refractive error (20%). The most common cause of ocular trauma was paddy (18.84%). Notably, 114 (43.85%) farmers reported never wearing personal protective equipment (PPE). Cataract and refractive error were identified as common causes of preventable and treatable blindness. Nuclear sclerosis (22.68%) was the most common type of cataract, and simple myopia (13.85%) was the most common type of refractive error. **Conclusions**: The ocular diseases identified among farmers were primarily linked to the hazards of the farming environment and prolonged outdoor exposure. It is essential to provide eye care services, including the distribution of protective eyewear, as part of the general health services offered to farm workers.

VISUAL STATUS OF NEPALESE AIR TRAFFIC CONTROLLERS

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Introduction: Air Traffic Controllers (ATC) ensure that aircraft, vehicles, and other surface objects maintain a safe separation distance and avoid airport runway incursions. It has been found that controllers tend to focus on the airspace with the highest traffic density, which may lead to the late identification of intrusions, resulting in the occurrence of unsafe events. Tower controllers ensure that aircraft, vehicles, and other surface objects maintain a safe separation distance and avoid airport runway incursions. This study aimed to estimate the visual status of Air Traffic Controllers. **Methods**: A Cross sectional study was conducted among 78 Air Traffic Controllers of Tribhuvan International Airport, Kathmandu. The proposal approved written letter was taken from BP Koirala Lions Centre for Ophthalmic Studies (BPKLCOS) to the General Manager of Tribhuvan International Airport (TIA). Informed written consent was taken by ATC registered with CAAN before participating in the study. Visual acuity, refraction, cover test, near point of convergence, near point of accommodation, accommodative facility, fusional vergence, stereopsis, Schirmer's test, colour vision, contrast sensitivity examination of anterior and posterior segment test were performed. The data were analyzed by using SPSS (Statistical Package for Social sciences) version 21.0. **Results:** Among 78 ATC, 45 were found to have significant refractive error. Unusual visual symptoms related to computer screen exposure were mostly headache during working hours (30%), blurring of vision (26.9%) and eye strain (24.4%). 75% of the total subjects were found to have abnormal Schirmer reading. Among the non-presbyopic population 13% had reduced amplitude of accommodation and 28% had an accommodative infacility dysfunction problem. **Conclusions**: The presenting visual acuity, colour vision and visual field were found with in normal limit as required by Civil Aviation Authority of Nepal (CAAN). The prevalence of eyestrain related near work was found significant. Unusual visual symptom related with computer screen exposure were mostly headache during working hours. Most of the ATC had significant symptoms of dry eye and were having poor tear film.

COMPARISON OF TOPOGRAPHIC PARAMETERS IN SCHEIMPFLUG CAMERA AND PLACIDO DISC FOR PRE & POST KERATOCONUS SURGERY

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Introduction: The prevalence of keratoconus varies globally due to environmental, ethnic factors, and differences in patient cohorts. Accurate topographic measurements are crucial for tracking disease progression. This study aims to evaluate the repeatability and accuracy of MS-39 anterior segment OCT (CSO) and Pentacam HR in comparing pre- and post-operative topographic parameters of keratoconic eyes.   **Methods**: In this study, data from 150 keratoconic eyes were collected and analyzed. Multiple consecutive measurements per eye were obtained. Central Corneal Thickness (CCT), Pachymetry (Thinnest Location), Anterior Chamber Depth (ACD), Steep Keratometry Reading (K1), Flat Keratometry Reading (K2), Maximum Keratometry Reading (K Max), White to White (WTW), RMS Higher Order Aberrations (HOA) data were compared.   **Results:** A total of 150 eyes (98 male, 52 female) were examined. The participants had a mean age of 24.66 ± 6.29 years. Descriptive statistics summarized the baseline characteristics of test parameters. Shapiro-Wilk test indicated that the data was not normally distributed ($p < 0.05$, W= 0.89). The Bland-Altman plot demonstrated a good agreement between methods. The mean differences and limits of agreement in pre surgical readings were as follows: K1: 1.0305 (-3.306 to 5.367), K2: 0.5761 (-3.312 to 4.464), KMAX: 1.8422 (-6.839 to 10.523), CCT: 7.22 (-49.123 to 63.563), TL: 14.33 (-27.661 to 56.327), ACD: 0.3299 (-0.244 to 0.904), WTW: 0.1503 (-1.496 to 1.796), and HOA: 0.5927 (-3.969 to 5.154) respectively and the post operative readings were K1: 3.57 (-55.4 to 62.6), K2: 0.87 (-2.75 to 4.486), KMAX: -5.11 (-20.92 to 10.701), CCT: 25.25 (-77.61 to 128.11), TL: 18.63 (-79.4 to 116.65), ACD - 3.411 (-87.82 to 81.1), WTW: 0.349 (-1.28to 1.98), and HOA: 0.341 (-11.62 to 10.9) respectively. The Pearson correlation analysis revealed a strong positive correlation ($r = 0.85$, $p < 0.001$) between the two measurement methods, indicating robust agreement in assessing the studied parameters. **Conclusions**: Both instruments showed reliable results, consistent with prior research. Monitoring keratoconus progression should consider the variability in topographic and tomographic parameters rather than fixed values. Despite non-normal data distribution, the instruments performed consistently without significant patterns or trends in measurement differences.

CRUCIAL ASPECTS OF OPTOMETRIC MANAGEMENT IN 2-MONTH-OLD CHILD POST CONGENITAL CATARACT SURGERY

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Background: In India, the prevalence of congenital cataract is estimated to range from 1 to 6 cases per 10,000 live births. Some studies suggest higher prevalence rates in certain states or rural areas compared to urban centers. Congenital cataracts can have significant impacts on the health and development of affected children like visual impairment, amblyopia, developmental delay, psychosocial impact, surgical complications, long-term visual rehabilitation, family and caregiver impact. **Clinical problem:** A 2-month-old infant presented at the Optometry clinic where there was a complaint from the parents that white reflex was visible in the child's eyes since birth. Her father also had congenital cataract and operated at the age of 15 years. Her birth was normal with full term with no systemic disease or injury during/after birth. On ocular examination, her both eyes pupil were found round, regular and reacting. Her menace reflex was absent. No glow was seen on Bruckner's test. She was following light in all directions but not fixing well on the light. She was diagnosed a case of congenital cataract in both eyes and was advised for cataract surgery. Post cataract surgery indicated that she started fixing directly on light and following with central and steady fixation (no nystagmus developed). Her refractive error was +22.0 D in both eyes and she was prescribed near dominant glasses of +25.0 D as per her requirement. Head band was also given for better fit, stability, safety, adjustability and good compliance. We kept her on monthly follow-ups to assess refractive error, retina and eye health. In 3 months of follow-up her refractive error reduced by +2.00 D and she was advised +23.0 D in both eyes. Her visual acuity improved, started smiling on seeing her mother's face, grab toys near her, developed neck stability . Her intra ocular pressure was 10 mmHg in both eyes with stable retina. **Existing solution(s) and its shortcoming:** There are key aspects of optometric management post-congenital cataract surgery: Visual acuity assessment, prescribe appropriate glasses or contact lenses to optimize visual acuity, adjust prescriptions as needed during follow-up visits, considering the child's growth and changing refractive needs, consider appropriate interventions such as glasses, contact lenses, or patching therapy in case of anisometropia, frequent follow-up to avoid amblyopia, provide visual stimulation and therapy to promote optimal visual development, educate parents on activities and strategies to support visual rehabilitation at home, schedule regular follow-up visits to monitor overall development, family education and support for better compliance, discuss the long-term visual prognosis with parents, including potential challenges and strategies for maximizing visual outcomes. **Clinical pearls:** Early detection and intervention in congenital cataract, early visual rehabilitation, frequent follow-up visits, refraction and optical correction, amblyopia management, strabismus assessment, patient and family education, Multidisciplinary collaboration, long term monitoring and prognosis for optimal visual outcomes. **Take home message:** Optometric management in congenital cataract surgery requires a multidisciplinary approach, close collaboration with pediatric ophthalmologists, and a focus on early

intervention and ongoing care to optimize visual function and support the overall development of children affected by congenital cataracts.

Scientific Session 9: Primary Eye Care

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EVALUATING LANDSCAPE IN INDIAN OPTOMETRY

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Introduction: Optometry is a specialized healthcare profession that involves examining the eyes and related structures for defects or abnormalities. At present, the training of optometrists varies from two year trained optometrists to four-year degree trained optometrists. The profession of optometry in India is not regulated, integrated into the health care system or recognized by the majority of people in India as provider of comprehensive eye care services. This study will provide overview of optometric institutions in India from beginning to till now. **Methods**: This qualitative and descriptive study will be conducted among all leading optometry institutions and surveyed by physical visit using semi-structured questionnaire. Institutions and optometrists who were not willing to share information were excluded. **Results:** In the last two years, most of the optometry institutions in India have begun to take the necessary steps to gain recognition and regulation to become an independent primary health care profession. **Conclusions**: The formation of the Indian Optometric Association as the single peak body of optometry in India and the soon to be established Optometry Council of India, Indian Optometry Federation are key organizations working towards the development and regulation of optometry.

PREDICTIVE FACTORS FOR EARLY NEURODEGENERATIVE CHANGES IN PRE-CLINICAL DIABETIC RETINOPATHY IN TYPE 2 DIABETES MELLITUS

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Introduction: Diabetic retinopathy (DR) is a leading cause of vision loss in diabetes mellitus (DM) patients worldwide. Unfortunately, the current prediction of pre-clinical DR in asymptomatic patients is limited due to lack of suitable indicators. Therefore, optometric management can be improved if early retinal neurodegenerative and visual function changes can be predicted in DM patients before visible clinical fundus alterations. This study aimed to identify predictors of neurodegenerative and visual function changes in type 2 DM patients during the pre-clinical stage of DR. **Methods**: Fifty-six adult DM participants (mean age: 40.41 ± 7.28 years; age range: $20 - 50$ years) were recruited and classified into three groups: DM without DR, DM with mild non-proliferative DR (NPDR), and DM with moderate to severe NPDR. Demographic data, including age, gender, race, DM duration, HbA1c levels, household income, comorbidities, and insulin dependency, were collected. Visual functions, such as logMAR visual acuity, colour vision, and contrast sensitivity, were assessed. Additionally, retinal morphology, including macular retinal layer thickness, peripapillary retinal nerve fiber layer (RNFL), and vascular caliber were analysed. Multinomial logistic regression models employed to explore these factors' associations with NPDR stages. **Results:** Participants with moderate-severe NPDR less likely to have DM without comorbidities (OR: 0.048, 95% CI: 0.003-0.823, p=0.036). Those with longer DM duration were 27% more likely to develop moderate-severe NPDR (OR:1.272, 95% CI: 1.035-1.564, p=0.022). Of all measured visual functions, only contrast sensitivity significantly predicted NPDR, with the moderate-severe NPDR group having higher risks of lower contrast sensitivity compared to DM without DR (OR: 0.756, 95% CI: 0.627-0.913, p=0.004). Retinal morphology parameters, including peripapillary RNFL and macular thickness, did not predict NPDR risk and severity levels in DM patients, except for mild NPDR, which had a 1.05 times higher risk of wider central retinal arteriolar equivalent (CRAE) (OR: 1.052, 95% CI: 1.002-1.105, p=0.043). **Conclusions**: These predictors aid in identifying high-risk NPDR patients, allowing for early diagnosis and personalized care. This study emphasizes the importance of DM duration, comorbidity presence, reduced contrast sensitivity, and widened CRAE as critical parameters for assessing neurodegenerative changes in pre-clinical DR.

EFFECTS OF VISIBLE BLUE LIGHT RADIATION ON THE EYE

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Introduction: Constant, continuous and excessive usage of digital devices can create harmful effects on the Eye and general health. Excessive use of digital devices may contribute to the development of Reactive Oxygen Species (ROS) and could lead to degenerative changes in human eyes. Very little blinking exaggerates the ocular signs and symptoms. **Methods**: This comparative cross-sectional study was conducted in 2022. Subjects were selected based on inclusion and exclusion criteria and convenience sampling. Validated questions (smartphone addiction) and OSDI questionnaires were noted. Demographic data, history, symptoms (frequency and severity), signs, and clinical findings were noted down for documentation purposes. **Results:** Of all participants, 600 completed all procedures (29 subjects refused to participate in the study after filling out the form). Finally, 571 subjects were selected for this study, 97.75% used smartphones from different companies and 84.64% were smartphone addictive. Of all participants, 65.7% suffered headaches frequently, 33.3% had ocular and peri-ocular pain and 45.32% continuously felt ocular dryness. Ocular fatigue and convergence insufficiency were common in nearly 65% of participants. The strong correlation between very little incomplete blink and exposure dryness is very significant. The data shows ocular symptoms are significantly less in spectacle users (14.4±2.9) in comparison to non-spectacle users (18.29±6.49). And blue block lens users (11.14±3.175) are significantly less symptomatic in comparison to the non-spectacle users (18.29±6.49) ($p < 0.05$). Other results will also be presented.

COMPARATIVE STUDY OF STEREOACUITY AND COLOUR VISION AT HIGH ALTITUDE AND LOW ALTITUDE

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Introduction: High altitude environments are associated with low barometric pressures and reduced oxygen levels, which can lead to various functional changes in vision. This study aims to compare the effects of high altitude on stereoacuity and colour vision in the Mustang district of Nepal with those in the relatively lower altitude of the Kathmandu Valley. **Methods**: A quantitative, comparative study was conducted involving 348 participants for stereoacuity and 319 participants for colour vision, residing in high altitude (Mustang: Jomsom 2710 m, Kagbeni 2900 m, Jharkot 3500 m and Muktinath 3800 m) and lower-altitude (Kathmandu Valley: 1350 m). Stereoacuity was measured by the Frisby Stereotest. Colour vision was assessed using the Ishihara Pseudoisochromatic Charts. Mann-Whitney test and Chi-square test were used for statistical analysis. **Results:** The median threshold of stereoacuity at high altitude (20.11 seconds of arc) was higher compared to the median threshold of stereoacuity at low altitude (17.94 seconds of arc) which was significant with p-value of 0.013 indicating poorer stereopsis at higher altitudes. Variation of stereoacuity with age and visual acuity was significant. 59% of residents high altitudes were able to read all the 17 plates of the Ishihara Pseudoisochromatic plates compared to 97.3% of the participants residing at lower altitude of Kathmandu Valley which was significant with p value of 0.000 indicating that there was a marked deterioration in colour vision at higher altitudes. **Conclusions**: High-altitude residency is associated with a significant reduction in both stereoacuity and colour vision sensitivity. The decreased oxygen availability at high altitudes affects higher visual functions, leading to depressed stereopsis and colour discrimination. Further research is recommended to explore the impact of long-term adaptations in residents of high altitudes.

COMPARISON OF VASCULAR FEATURES ON OCT-ANGIOGRAPHY BETWEEN AMBLYOPIC AND NORMAL EYES

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Introduction: The main aim of this study is to compare the vascular features as well as changes in retinal nerve fiber layer (RNFL) thickness between amblyopic eye and normal eye in case of unilateral amblyopia. **Methods**: A prospective, cross sectional, comparative study including 40 case of unilateral amblyopia (40 amblyopic eyes compare with 40 fellow normal eyes) between age 5-18 years. All the samples underwent detailed comprehensive eye examination followed by Optical Coherence Tomography Angiography (OCTA) and OCT-glaucoma (RFNL Thickness) performed in each eye using Spectral Domain Optical Coherence Tomography. Foveal avascular zone (FAZ) area and vessel density (VD) in superficial and deep retinal plexus, Choroidal Vascularity Index (CVI), Vascular Flow area and Flow Void area in Choriocapillaries plexus (CC) and Retinal Nerve Fiber Layer Thickness (RNFLT) in four quadrants (inferior, nasal, superior and temporal) were measured and compared between amblyopic eye and normal eye. **Results:** The mean FAZ difference in SCP and DCP was 18.68 ± 61.50 and 8.59 ± 33.54, respectively. The mean VD in SCP and DCP was $62.28 \pm 3.78\%$ and $31.98 \pm 3.58\%$ in the amblyopic eye and $62.96 \pm 3.96\%$ and 32.65 ± 3.68 in the normal eye. No statistically significant difference was observed when comparing vascular features (macular vessel density and CVI) between the amblyopic and fellow eyes of unilateral pediatric patients. RNFLT in the inferior, superior, nasal, and temporal quadrants was also not significant, with p values of 0.682, 0.143, 0.156, and 0.709, respectively. **Conclusions**: After conducting this study, we can conclude that FAZ area and VD does not seem to be significantly affected by unilateral amblyopia, as no substantial difference was detected between amblyopic and normal eyes.

MANAGEMENT OF EPITHELIAL BASEMENT MEMBRANE DYSTROPHY AND PATHOLOGICAL MYOPIA USING SCLERAL LENSES: A COMPREHENSIVE APPROACH

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Background: A 27-year-old female visited to Dr Shroff's Charity Eye Hospital with complainted of dryness along with irritation in both the eyes. Baseline best corrected distance visual acuity was 6/36 in both the eye**.** Patient was diagnosed with epithelial basement membrane dystrophy (EBMD) along with pathological myopia in both the eye and advised for contact lenses. Patient was advised scleral lenses and achieved 6/18 in the first visit with scleral lenses. Patient came for follow up after 4 months and vision was improved to 6/9. Signs and symptoms can include: fluorescein stain dye negative, irregular putty-white-grayish dot appearance, irritations, blurred vision, foreign body sensation in the eye, redness and dryness. The key features include: significant elongation of the eyeball, thinning of the retina and sclera, increased risk of complications such as retinal detachment and macular degeneration. **Clinical problem:** When EBMD coexists with pathological myopia, it can lead to several complex issues, for examples, increased risk of corneal erosions and visual disturbances. Pathological myopia can cause thinning and weakening of the cornea and sclera, increasing the risk of complications due to the irregularities caused by EBMD. **Existing solution(s) and its shortcoming:** Managing EBMD with pathological myopia requires a comprehensive and multidisciplinary approaches such as the use of bandage contact lenses. These lenses can protect the cornea and provide a smoother surface, aiding in healing. for severe cases of EBMD, corneal debridement could occur, removing the abnormal epithelium can promote healthier regrowth. Refractive surgery procedures like PTK (Phototherapeutic Keratectomy) may be considered, but careful pre-surgical evaluation is crucial due to the presence of both EBMD and pathological myopia. Regular monitoring and follow-up is essential to manage and treat emerging complications effectively. **Clinical pearls:** Scleral lenses, which are large-diameter gas-permeable lenses that rest on the sclera while vaulting over the cornea, have shown considerable promise in managing these combined conditions. Key benefits include creating a smooth optical surface which significantly improve visual acuity and comfort for patients with EBMD and pathological myopia.Tear reservoir that is maintained by scleral lenses provides continuous hydration, thereby protecting the cornea from erosions and reducing symptoms of dry eye. **Take home message:** Scleral lenses offer a valuable therapeutic option for patients with the dual challenges of EBMD and pathological myopia. Their ability to provide a smooth optical surface, continuous corneal hydration, and protection from erosions makes them an effective component of a comprehensive treatment plan. Through personalized care and multidisciplinary collaboration, the integration of scleral lenses can significantly enhance visual quality and ocular health, ultimately improving the quality of life for affected individuals.