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Al-Shifa Journal of Ophthalmology

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ORIGINAL ARTICLE

Management and Prophylaxis of Negative Dysphotopsia With Sulcus Placed Intraocular Lenses

Jonas V. Laursen [1,2], Kristian Naeser [1,2], Jan K. Pedersen [1,2], Peter Jeppesen[1]

ABSTRACT:

Purpose: To describe the effect of sulcus placed intraocular lenses (IOLs) on negative dysphotopsia (ND), both as a treatment and as a prophylactic modality for high risk patients.

Materials and Methods: Retrospective cohort of all 2795 patients who underwent phacoemulsification at Randers Regional Hospital (RRH) in Denmark over a three-year period was used. All patients who, due to negative dysphotopsia, received a sulcus placed IOL either as treatment (n=3) or prophylaxis (n=9) were identified. Similarly, all patients undergoing IOL-exchange at Aarhus University Hospital (AUH) in Denmark over a three-year period were reviewed and cases identified where a sulcus IOL was given due to negative dysphotopsia (n=10). A case-control comparison was made between the fellow eyes of patients with ND, in terms of the probability of developing ND if they had an in-the-bag IOL vs. sulcus placed IOL.

Results: A total of 13 eyes underwent IOL exchange from an in-the-bag IOL to an IOL in the ciliary sulcus, causing immediate relief of symptoms in all cases. Five out of seven patients who had an in-the-bag IOL in the fellow eye developed ND. In contrast, none of the 9 patients who underwent prophylactic sulcus placed IOL in the fellow eye developed symptoms. The prophylactic sulcus placed IOL in the fellow eye significantly lowered the risk of negative dysphotopsia (p=0.023, Z-test).

Conclusion: Replacing an in-the-bag IOL with an IOL in the ciliary sulcus immediately resolves symptoms of negative dysphotopsia. No fellow eyes with primary sulcus implanted IOLs developed symptoms. *Al-Shifa Journal of Ophthalmology 2018; 14(3): 115-118.*

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Introduction:

Negative dysphotopsia (ND) is a phenomenon first described after the introduction of acrylic intraocular lenses (IOLs) with in-the-bag placement during cataract surgery. It is described as a dark shadow, typically crescent shaped, in the temporal field of vision. In some cases, this can become unbearable and have a profound impact on quality of life.[1] The incidence of negative dysphotopsia varies greatly in the existing literature from 0.12% to 15.20%.[1,2,3,4]

The cause of this phenomenon has been heavily debated, the predominant theory is that it is caused by the square posterior edge of the IOL optic.[5,6] Others advocate that it is due to the overlying anterior capsular edge.[7]

Multiple treatments have been employed with varying success, including IOL exchange to another IOL design and/or material,[1,2,8] Neodymium: YAG laser anterior capsulectomy,[9] implantation of piggy-bag lenses,[8,10] reverse optic capture[8,10] and IOL exchange to an IOL placed in the ciliary sulcus.[2,8,11]

The rationale behind this study is that placing an IOL in the ciliary sulcus would bring the offending posterior IOL edge so much forward that it would not generate a shadow that hits the retina.

Materials and Methods:

This study is based in two centers, Department of Ophthalmology, Randers Regional Hospital (RRH), Denmark and the Department of Ophthalmology at Aarhus University Hospital (AUH), Denmark. All 4898 phacoemulsification procedures performed on 2795 patients at RRH between January 1st, 2012 and December 31st, 2014 were included. The standard IOL in RRH is the Tecnis 1-piece IOL (Abbott Medical Optics, Illinois, USA). In case of negative dysphotopsia in the first operated eye, a Tecnis 3-piece IOL (Abbott Medical Optics, Illinois, USA) is placed in the sulcus on the second eye as a preventive measure. All 2795 patients from this 3-year timespan was used as a retrospective cohort. By doing a search in the electronic medical record system of all patients, the individuals who did not receive the standard IOL were identified. These records were reviewed manually and the patients who received a sulcus IOL either as treatment or prophylaxis for negative dysphotopsia were identified.

Medical records of all patients undergoing IOL-exchange in AUH between January 1st, 2012 and March 31st, 2015 were reviewed, and cases identified where a sulcus IOL was implanted due to negative dysphotopsia. Patients undergoing IOL-exchange in AUH had the Alcon MC50BD implanted in the ciliary sulcus instead. RRH provides cataract surgery for the general population. All ND cases in RRH therefore originated from the same centre. AUH is a highly specialized department that receives complicated cases and treats non-complicated cases to be able to train new surgeons. In AUH, ND cases came primarily from other clinics and centers, except from RRH where all ND cases are believed to have been contained in the studied time span.

All patients who met the above-mentioned criteria were included in the study, regardless of age, previous medical history, gender or other factors. Finally, a case-control comparison was made between the fellow eyes of patients with ND, in terms of the probability of developing ND if they had an in-the-bag IOL vs. sulcus placed IOL. All data handling, calculations and statistical analysis with Z-test for proportions were done in Microsoft Excel 2007.

Results:

Thirteen eyes (10 from AUH + 3 from RRH) underwent IOL exchange from an in-the-bag IOL to an IOL in the ciliary sulcus, causing immediate and complete remission of negative dysphotopsia in all cases. Patients with ND had a high risk of experiencing symptoms bilaterally when IOLs were placed in the bag in both eyes. Implanting an IOL in the ciliary sulcus in the fellow eye significantly decreased bilateral suffering, since no eye with sulcus placed IOL developed ND. This is shown in Table 1. Patients who had only been unilaterally operated are not shown. Furthermore, it must be noted that some of the patients with bilateral symptoms only chose to have the worst eye treated.

Table 1. Effect of IOL placement on negative dysphotopsia, case-control comparison			
Patients with ND	No. patients [n]	Bilateral symptoms	Probability of bilateral ND [CI]
In-the-bag IOL in both eyes	7	5/7	0.71 [0.38-1.05]*
In-the-bag IOL in one eye, sulcus IOL in the fellow eye	9	0/9	0 [NA]*
ND: Negative dysphotopsia. CI: Confidence interval. NA: Not available *Significantly different at p=0.05, p-value= 0.023 using Z-test for proportions			

Discussion:

The pathogenesis behind negative dysphotopsia remains unclear. Most, if not all, theories do however agree that it is caused by a shadow cast on the peripheral retina. The shadow is only perceived temporally since this is where the field of vision has the furthest range, corresponding to a functional nasal retina that extends very peripherally. What casts this shadow is however heavily debated. The leading theory is that it is cast by the IOL edge, some believe it is caused by the anterior capsule edge, and a few suggest the temporal incision to be the cause, even though ND also occurs after superior incisions. However, some clinical patterns have been established. First, the anterior capsular edge cannot be the sole cause, Radford[3] shows that two different lenses (AcrySof SN60-AT from Alcon and Akreos Adapt from Bausch & Lomb) have a significantly different incidence of ND (p=0.007), despite all IOLs being placed in a similar fashion with an overlapping capsular edge. Secondly this also shows that IOL type matter, and although silicone lenses for instance does not prevent ND[12] it is noticeably less common than with acrylic IOLs[13]. Thirdly it has been shown by Borunas[13] that the risk of persistent negative dysphotopsia is significantly higher with a smaller IOL optic diameter.

The distance from the iris to the IOL does not seem to be larger in people with negative dysphotopsia[2] and collapsing the posterior chamber by suturing the iris to the IOL-capsular bag complex does not seem to help either.[10] According to the theoretical calculations by Holladay[5] the distance between the iris and the IOL only needs to be larger than 0.06mm for the IOL edge to be able to cast a shadow. For reference, the distance between the iris and a sulcus IOL was found to be 0.00mm by Vámosi et al.[2]

This study does not shed much further light on the pathogenesis, it could be argued that it is the placement in front of the anterior capsule that helps, or it is the more anterior placement of the IOL that prevents negative dysphotopsia from occurring. However, given the above-mentioned evidence it seems unlikely that negative dysphotopsia is induced by the anterior capsular edge.

A lot of treatment modalities have been described thus far, plus a few prophylactic ones. The strategies that have a vastly greater outcome than the rest are, as described here, exchange to an IOL in the ciliary sulcus[2,8,11] but also reverse optic capture.[8,10,14]

The results of this study correlates very well with the literature, since exchanging to an IOL in the ciliary sulcus to treat negative dysphotopsia has an almost perfect track record. Lastly it should be noted that surgery is only warranted in severe cases, because most patients will be rid of their symptoms, without treatment, within months.[4]

Conclusion:

Exchanging the in-the-bag IOL with a sulcus placed IOL is very effective for removing symptoms of negative dysphotopsia, it did so in all cases in this study. It is very important that the chosen IOL is suitable for placement in the sulcus, a single-piece IOL could cause chafing and pigmentary dispersion glaucoma. Should negative dysphotopsia arise after cataract surgery in the first eye, IOL placement in the ciliary sulcus during primary surgery in the fellow eye can be considered, since it significantly lowers the risk of negative dysphotopsia.

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Drafting: Jonas V. Laursen, Kristian Naeser
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ORIGINAL ARTICLE

Medical Calls Written to Ophthalmologists for Consultation by Various Faculties

Ashfaq ur Rehman[1], Abdul Aziz[1], Mohammad Israr[1], Usman Attique[1], Asad Ullah[1], Waleed[1]

ABSTRACT:

Introduction: Health sciences have been stratified into multiple disciplines with various sub specialties emerging over a period. Each medical faculty has its importance at certain areas of healthcare provision that influence the management plans of other medical disciplines as well.

Objective: `To know the frequency and patterns of medical calls written to Ophthalmologists.

Subjects and Methods: A descriptive study was conducted in Ophthalmology Department of Hayatabad Medical Complex Peshawar, from 1st February to 30thJuly 2017. The study duration was 6 months. All medical calls of the indoor patients of different medical faculties that were written to ophthalmology department and were attended either by consultants or trainees on slit lamps / direct ophthalmoscope.

Results: A total of 298 medical calls were attended in Ophthalmology Department (OPDs, wards and OTs) and various other departments where patients were bed ridden and unable to come to ophthalmology department to be examined. It included calls both for the therapeutic (52.69 %) and diagnostic purposes (47.31%). Most of the medial calls were from the Pediatric Department (93 patients) followed by Endocrinology unit (89 patients). Mostly, the requests were made for fundus examination of the patients for various clinical findings and features.

Conclusion: Various clinical diseases present with different ocular manifestations that urge ophthalmologists to do detail examination and gave opinion both for diagnostic and therapeutic purposes. Hence, it is recommended for different health faculties to have a liaison with ophthalmologists in terms of medical calls for collaborative approach towards the patient health care. *Al-Shifa Journal of Ophthalmology 2018; 14(3): 119-126.*

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Introduction:

Health sciences have evolved into various disciplines over a period. Each discipline has importance at its place that influence and augment the management plans of other medical disciplines. Ophthalmologists are concerned with the etiology, diagnosis and treatment of various disorders related to the eye, orbit, and visual system. Several systemic diseases including endocrine, metabolic, inflammatory, infectious, hematological and hereditary conditions present with different ocular features. These findings if not timely appreciated often lead to delayed diagnosis and mismanagement. As it is quite rightly recognized, the eye importantly contributes to the diagnosis of a wide variety of systemic disorders, many

times being the first visible clinical manifestation of the general problem, as well.[1-3]

Usually GPs and doctors of internal medicine refer patients to ophthalmologists to undergo funduscopy either as an "emergency" case or in the context of a detailed systemic clinical examination.[4]In clinical practice, Ophthalmologists are particularly requested for funduscopy in pediatric and diabetic patients for the presence of disc swelling and diabetic retinopathy, respectively. Half of the people with diabetes are unaware that they have the disease and a third of diabetics never undergo eye examination.[5]

Similarly, medical faculties also write medical calls for diagnostic clinical features such as Kayser Fleischer (KF) rings, Roth spots, cherry red spots etc. Consultation calls made for therapeutic purposes include; treatment of allergy and dry eyes, addressing causes of decreased vision, repairing lacerated lids and globes, panretinal photocoagulation in proliferative retinopathies etc. The input into diabetic retinopathy screening by hospital based ophthalmologists was taking place for many years before routine screening became a reality.[6] In their review of screening for visual deficits in children in the United Kingdom, Rahi.*et al* stressed the importance of the input of the ophthalmic community and its position to take the lead.[7]Since the wellbeing of the foetus depends on the placental circulation, ophthalmoscopic examination of mother's fundus may give a clue to similar micro-circulation changes in the placenta and indirectly to the foetal wellbeing. Fundus examination in patients with pregnancy induced hypertension (PIH) is an important clinical evaluation to predict adverse foetal outcomes.[8] Ophthalmoscopy does not only help in diagnosing the disease, but repeated observations assist in assessing the severity, progress of disease, response to treatment if any and ultimate outcome or prognosis.[9-11]

To our knowledge there has been no study so far available at national level that has evaluated the patterns of medical calls written by various disciplines to ophthalmologists. Therefore, this study was designed to determine the frequency and pattern of calls to ophthalmologists, made either for diagnostic or therapeutic purposes from various other faculties, to highlight importance of liaison of clinicians with ophthalmologists in their clinical practice.

Subjects and Methods:

A prospective descriptive study was conducted in ophthalmology department of Hayatabad Medical Complex Peshawar, from 1st February to 30thJuly 2017.The study duration was 6 months. All medical calls of the indoor patients of different faculties written to ophthalmology department were attended either by consultants or trainees on slit lamps or with direct ophthalmoscope. The designed proforma included age of the patient, gender, faculty of referral, clinical findings, diagnosis of the disease, clinical features or treatment requested for and purpose of medical call. The collected data was then analyzed for patterns of calls. All the data analysis was done using SPSS version 20.0.

Results:

In a data of 298 medical calls,207 calls were attended in outpatient departments (OPD), 36 in eye wards,27 in operation theatres (OT) and 18 cases in various medical units where patients were bed ridden. Male to female ratio was 1.17:1 (Figure: 1) with most common age group above 45 years. (Table:1)

Of 298 calls, 141 (47.31 %) of the medical calls were for therapeutic and 157 (52.69 %) for the diagnostic purposes (figure 2). Medical calls most frequently received and attended were from the Pediatric Department (93 patients,31.2 %), followed by Endocrinology department (89 patients, 29.86 %), that were mostly for diagnostic

and therapeutic purposes respectively. (Table: 2).

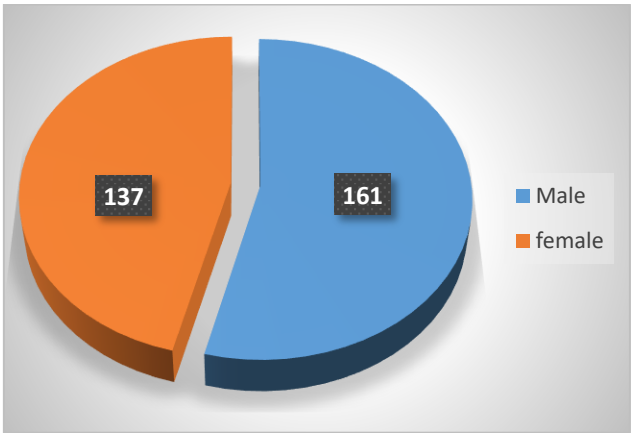

Figure 1: Gender Distribution of patients with medical calls

Table 1: Frequency of age groups& gender distribution

Age Group	Male	Female	Total
0-15 years	57	44	101
16-30 years	18	16	34
30-45 years	14	25	39
>45 years	72	52	124
Total	161	137	298

Table 2: Frequency of medical calls from various faculties

Medical Faculties	Diagnostic		Therapeutic		Total cases	
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Paediatrics	64	68.81	29	31.18	93	31.20
Endocrinology	24	26.96	65	73.04	89	29.86
Gynaecology	11	61.11	7	38.88	18	6.04
Neurosurgery	6	35.29	11	64.70	17	5.70
Medical	9	60.00	6	40.00	15	5.04
Gastroenterology	9	81.81	2	18.18	11	3.70
Oncology	7	77.77	2	22.22	9	3.02
Neurology	5	62.50	3	37.50	8	2.69
Dermatology	2	25.00	6	75.00	8	2.69
Plastic surgery	0	00	7	100	7	2.35
Maxillofacial	0	00	7	100	7	2.35
Orthopaedics	0	00	6	100	6	2.01
G.Surgery	0	00	6	100	6	2.01
Cardiology	4	100	0	00	4	1.34
Total	141	47.31	157	52.69	298	100

Table 3: Pattern of calls for Diseases and Ocular Findings

Medical Faculties	Patterns of Diseases	Ocular Findings
	Meningitis/Encephalitis Mucopolysaccharidosis TB Measles	Papilloedema Cherry red spot Choroidal Tubercle
Endocrinology	Diabetic Retinopathy Thyroid Acromegaly	Diabetic Retinopathy Thyroid Eye disease Optic disc atrophy
Gynecology	Eclempsia Retinopathy Gestational Diabetes	Hypertensive retinopathy/ Exudative RD Diabetic retinopathy
Neurosurgery	Space Occupying Lesion/ BIH Trauma	Papilloedema Globe/orbital fractures
Medicine	Hypertension Meningitis/Encephalitis MG Mucormycosis	Hypertensive Retinopathy Papilloedema Ptosis Orbital cellulitis
Maxillofacial	Trauma	Lids/Globe rupture
G. Surgery	Trauma	Lids/Globe rupture
Gastroenterology	Wilson Disease	Kayser Fleischer Ring
Oncology	ALL CML Lymphoma	Roth spots,Haemorrhages Proptosis/Orbital metastasis
Neurology	Multiple Sclerosis Stroke	Optic Neuritis/disc swelling Ptosis/exposure keratopathy
Plastic Surgery	Lid/Orbital Tumours	Lid reconstruction/Exenteration
Dermatology	Steven Johnson Syndrome SLE	Dry eyes/conjunctival scarring Central serous retinopathy
Cardiology	Marfan Syndrome	Ectopialentis

Discussion:

Ocular examination is an integral part of detailed systemic evaluation in various diseases. Most of the clinical features in eyes are either not visible with naked eyes or require skillful techniques with diagnostic tools, hence other faculties very often need ophthalmologist help for picking clinical signs, that are seen with direct and indirect ophthalmoscopes or slit-lamps, to augment their clinical diagnosis. Thus, medical calls are written in the majority of public hospitals, where ophthalmologists are requested for ocular examination to aid in diagnosis and treatment.

In our study, most (69.4 %) of the medical calls were attended at OPDs, followed by 12 % in eye wards,9 % uncooperative patients were examined in operation theatres under general anesthesia while 6 % medical calls were attended in other departments where patients were either unconscious or bed ridden. Both the diagnostic tools such as ophthalmoscopes and slit-lamps and laser equipment are easily available in morning at ophthalmology department in OPDS, therefore most of the medical calls were attended at these timings at OPDs followed

by eye wards. Secondly most of the senior faculty members are available in OPDs and patient management plans are decided in morning ward rounds by consultants of various disciplines where they ask ophthalmologists for consultation.

The common age group observed was above 45 years that was followed by child age group of 0-15 years. Most of the medical calls were received from Pediatric and Endocrinology units due to more frequently prevailing clinical entities, meningitis and diabetes mellitus with common ocular manifestations requiring utmost consideration in these age groups, respectively. Overall, call requests attended for therapeutic purposes were found more than for diagnostic purposes, particularly from endocrinology unit. However, pediatric medical calls were more commonly received for diagnostic purposes.

In pediatrics most of the calls for funduscopy were to rule out papilloedema (optic disc swelling due to raised intracranial pressure), seen most commonly in patients with meningitis / encephalitis, which is a contraindication for lumber puncture usually required in such patients for CSF analysis. This was followed by requests for findings of cherry red spot seen in metabolic disorders and choroidal tubercle seen in miliary tuberculosis. Choroidal tuberculosis is present in 5–20% of patients with disseminated tuberculosis, and point-of-care dilated binocular indirect ophthalmoscopy eye examination can provide immediate diagnosis.[12]In regions with a high burden of tuberculosis, we recommend that eye screening be a standard part of the initial assessment of susceptible patients, including at a minimum all patients with HIV/AIDS with CD4 less than 100 cells per μL with or without eye symptoms, and with or without suspicion of disseminated tuberculosis.[12] Since 2007, indirect ophthalmoscopy has been taught to HIV/AIDS clinicians in Myanmar, China, and Russia.[13] Non-ophthalmologists can accurately diagnose cytomegalovirus retinitis with an indirect ophthalmoscope, which suggests that they would be able to reliably diagnose choroidal tuberculosis if given appropriate training.[14]

Eighty-nine medical calls were written from Endocrinology unit that included 80 diabetic patients, to be examined both for screening of diabetic changes and treatment. More than 50 % of patients examined had some lenticular opacity while 40 % of patients had diabetic retinopathies of different stages. Cataract and diabetic retinopathy changes observed were seen mostly in long term uncontrolled diabetic patients. Patients were offered cataract surgeries and different treatment options for diabetic retinopathies as per needed. Patients with long duration and uncontrolled diabetes require a team approach consisting of a physician, endocrinologist, ophthalmologists and other specialists. Recommended guidelines for the prevention of vision loss due to diabetes include early identification and well-managed DM, an annual eye examination to screen for DR in people with diabetes and treatment for DR by an ophthalmologist as required (laser treatment, vitreoretinal surgery or anti-vascular endothelial growth factor injections when available).[15]

Of Gynecology/obstetrics, a total of 18 medical calls were attended, either for blurring or decreased vision. Most of the patients had normal eyes with no ocular findings,4 had early hypertensive retinal changes of preeclampsia, 2 had non-proliferative diabetic changes while 1 patient had exudative retinal detachment in one eye that was kept under observation. Visual symptoms are few in patients with pregnancy induced hypertension (PIH] and often absent unless the macula is involved, presence of multiple hard exudates in retina may indicate albuminuric retinopathy,

papilloedema in the eyes may indicate raised intracranial tension and such patients may develop convulsions.[16]PIH is the most common cause of maternal mortality in Europe. It is also amongst the leading causes of maternal deaths in developing countries like India and Pakistan.[17]PIH, in its different forms, is responsible for 10 – 15% maternal deaths worldwide.[18] It is also associated with an increased risk of fetal and neonatal mortality.[19]

From Neurosurgery department there were 17 calls,14 calls were for fundus evaluation for space occupying lesions, Benign Intracranial Hypertension and traumatic head injuries. Head injuries are frequently associated with ophthalmic manifestations and consequent morbidity.[20]The Glasgow coma scale (GCS), neurodeficit and ocular signs contribute significantly to the prediction of outcome, emphasizing the importance of integrating ophthalmic assessment into the routine head injury assessment. [21] Surgery, Plastic surgery and maxillofacial faculty calls included patients that needed eyelids, orbital and globes repair mostly. Eleven to 15% of orbital fractures are associated with ophthalmological emergencies, the majority of which will present with diminished visual acuity or other visual changes. [22,23] Other significant ocular injuries that may require urgent, but less emergent, intervention include a ruptured globe, retinal tears or detachment, vitreous hemorrhage, hyphema, extraocular muscle injury, bone fragments impinging on the globe, orbital cellulitis, and traumatic optic neuropathy.[24]Comprehensive ocular assessment can contribute significantly to the overall understanding of the acute injury and the prognosis of the patient as well as ocular motor involvement, profoundly affecting their rehabilitation.[25]

Medical units had 11 cases of encephalitis/meningitis, malignant hypertensive retinopathy, each for fundus evaluation. Gastroenterology unit had 5 patients referred for KF ring. Kayser Fleischer rings are often thought to be pathognomonic for Wilson's disease and, when observed, should be considered secondary to Wilson's disease until proved otherwise. Specifically, Kayser-Fleischer rings are found in all cases with neurologic findings and in 70% to 90% of cases with liver disease. [26] A slit lamp examination is mandatory to make a diagnosis of KF rings particularly in the early stages, unless the rings are visible to the naked eye in conditions of severe copper overload. [27] Hence clinicians need training in eye diagnostic skills, appropriate guidelines for writing medical calls for eye examination and implementation of eye examination into clinical practice.

Conclusion:

Eyes reflect various intracranial and systemic disorders. Either as a presenting sign or late manifestation of the underlying disorder, ocular involvement in most of the cases is an alarming sign for timely intervention and management. Therefore, it is recommended and suggested to have a liaison among the different health faculties for collaborative approach towards the patient health care.

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ORIGINAL ARTICLE

Screening of Common Eye Problems in Children by School Teachers and Eye Health Workers

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ABSTRACT:

Objective: To assess the common eye problems in Children by ophthalmologists and optometrists along with the school teachers.

Study Design: Cross sectional observational study.

Place and Duration of Study: The study was conducted in school going children in District Kotli and District Bhimber, AJK, Pakistan from 1st October 2017 to 31st September 2018.

Materials and Methods: The data was calculated by simple random sampling technique and sample size was calculated by WHO sample size calculator with 95% confidence interval. After taking consent, data was collected through a self-designed proforma from both public sector and private schools of District Kotli and Bhimber. A team of teachers from each school was trained by conducting workshops to detect visual deficit, squint, and red eye. Eye examination kit consisting of vision chart, three-meter rope, first aid material for eye was provided. The screening was carried out at the community level initially and the affected children were referred for further examination to DHQ, Teaching Hospital, Mirpur, AJK, Pakistan.

Results: A total of 20,389 children with age range from 5 years to 17 years (mean 9.7 years) were screened by the teachers. Out of these screened children 750 (3.67%) were brought to our hospital. From the screened children, 323 (43%) had positive findings. The most commonly encountered condition was refractive errors which were present in 153 (20.4%) children followed by Squint 120 (16%) children. Conjunctivitis was also seen in 15 (2%) children and allergic eyes were 1.7% of screened and referred children. Apart from these, occasional cases of blepharitis, chalazion, stye and cataract were also observed.

Conclusion: School screening programs can play an essential role in the betterment of eye health and the avoidance of preventable blindness among school going children in Pakistan.
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Introduction:

An accurate vision plays a key role in a child's physical development, academic performance and overall well-being. At the time of admission in a school, every child's eyes should be screened for visual acuity and alignment by a trained person who can perform a thorough vision assessment of school-aged children. In case of a positive initial screening, the child should have a comprehensive examination by an ophthalmologist.[1] Visual impairment in children is a fairly common problem globally and remains one of the major causes of ocular morbidity. Many cases are

either preventable or have effective treatment.[2]

Vision 2020 The Right to Sight is a worldwide initiative that is launched by a coalition of non-government organizations (NGOs) and the World Health Organization (WHO), focuses at elimination of avoidable visual impairment and blindness on a global level.[3] Many vision impairing conditions can be detected by using simple methods in any office, such as Snellen visual acuity testing, corneal light reflex examination and cover-uncover testing. Strabismus is the most well-known cause of amblyopia, and its screening will lead to early intervention. The mainstays of therapy for amblyopia are forced use of the "weak" eye by patching the "good" eye, correction of any refractive error and finally surgical intervention to align the visual axis. If amblyopia is detected earlier in any child than the visual recovery and the long-term prognosis is quite satisfactory.[4]

One in every 20 children may be at risk of significant visual impairment resulting from amblyopia or strabismus in the United States. Similarly, strabismus can give rise to complications such as amblyopia, diplopia, and psychosocial issues in school going children.[5]

The two primary approaches to screening for correctable visual acuity deficits due to refractive error are either to test for the refractive error or to test for the visual acuity deficit. Visual acuity screening programmes for undetected correctable visual acuity deficits will inevitably identify some children with reduced vision due to causes other than refractive error, for example cataract or amblyopia.[6] These ocular morbidities in children must be diagnosed at an early age to prevent loss of vision and to achieve significant treatment outcomes. Unfortunately, effective screening for eye disorders and visual acuity can be difficult at the level of primary health care physicians. Young children usually refuse to participate in the screening process, and interesting fixation devices are often not available in the offices.[7] School eye health programmes, when integrated into broader school health education and backed up by eye and child health care services, can be of significant benefit to a larger number of children in our community.[8]

Material and Methods*:*

The data was calculated by simple random sampling technique and sample size was calculated by WHO sample size calculator with 95% confidence interval. A total of 20,389 children with age range from 5 years to 17 years, both male and females were included in this study. All these children using or not using glasses were included in the study. There were 690 teachers, 338 male, 356 female, 1 qualified optometrist, 3 student optometrists and 2 consultant ophthalmologists, who took part in the study. The ethical consideration was permitted from the Research Ethical committee Divisional HQ, teaching Hospital, Affiliated with Mohtarma Benazir Bhutto Shaheed Medical College, Mirpur as well as Education Department AJK. A written informed consent was taken by the parents. Teachers were provided with technical knowledge about primary eye care (PEC), with the help of charts and audio visual aids, vision testing, disease detection and referral of affected children on Proforma. Primary eye care kits were given to them which contained examination tools: 1 torch, with 2 batteries, 1 vision screening card (Snellen's test type), 1 instruction card, 1 measurement Rope of 3 meters. First aid material like eye pads & sticking tape, tetracycline eye ointment, primary eye care educational material (1 booklet) containing written material, a bag for keeping all this and a register for record keeping. The school teachers examined the children and the technicians helped them. The affected children with vision less than 6/12 or having squint, ptosis, amblyopia or red eye etc. were referred to the hospital.

Those affected children were examined at hospital and found either affected (Refractive error or diseased) or normal. The glasses and medicines were provided to the children with the collaboration of supporting NGO. After the provision of glasses and medicines, the ophthalmologist visited the community on regular basis and randomly checked the children again.

Results:

A total of 20,389 children with age range from 5 years to 17 years (mean 9.7 years) were screened by the teachers. Out of these screened children 750 were brought to our hospital. There were 423 male and 327 female children. Age distribution revealed that maximum number of children were from 7-10 Years (36.9%), followed by 11-14 years (30%).

Major presenting complaint was watering from eyes (36.3%) followed by itching in the eyes (27.6%), pain (18.9%) and Headache (18.4%). A significant association was found between age of the patients versus refractive errors (p-value 0.002) using the chi-square test, similarly another strong association was found between difficulty in watching blackboard with refractive errors (p-value (0.003) and Headache (p-value 0.003) using the chi-square test [Table: 1 & 2].
Table:1 Showed p value for association of refractive error with presenting complaints.

Review of past ocular history revealed that 13(1.7%) out of 750 referred children were wearing spectacles while squint was present in 9 (1.2%) children. Table:2 also shows p value for association of refractive error with past ocular history.

Out of these 750, 323 (43%) had positive findings. The most commonly encountered condition was refractive errors which were present in 153(20.4%) of screened children followed by Squint 120 (16%) children. Conjunctivitis was also seen in 15 (2%) children and allergic eyes were 1.7% of screened and referred children. Apart from these, occasional cases of blephritis, chlazion, stye and cataract were also observed [Table:3].

Table 1: Presenting complaints of children

Symptoms		Inference	Percentage	P-value
See board	Present	135	18%	0.003
	Absent	615	82%	
Headache	Present	138	18.4%	0.003
	Absent	612	81.6%	
Itching	Present	207	27.6%	0.021
	Absent	543	72.4%	
Watering	Present	272	36.3%	0.015
	Absent	478	63.7%	
Pain in eyes	Present	142	18.9%	0.023
	Absent	608	81.1%	
Redness	Present	40	5.3%	0.032
	Absent	710	94.7%	
Trauma	Present	4	0.5%	0.015
	Absent	746	99.5%	
Other complains				0.026
Present		2	0.3%	
Absent		748	99.7%	

Table 2: Past Ocular History

History	Inference	Percentage	P-value
Spectacles			0.122
Present	13	1.7%	
Absent	737	98.3%	
Squint			0.134
Present	9	1.2%	
Absent	741	98.8%	
Family history		0.3%	0.011
Present	2	99.7%	
	748		
Absent			
Ocular Surgery			0.051
Present	4	0.5%	
Absent	746	99.5%	
History of Ocular Diseases			0.016
Present	0	0%	
Absent	750	100%	

Table 3: Diagnosis in affected children

Disease		Inference	Percentage
Refractive errors	Present	153	20.4%
	Absent	597	79.6%
Squint	Present	120	16.00%
	Absent	630	84.00%
Blepharitis	Present	12	1.6%
	Absent	738	98.4%
Chalazion	Present	2	0.26%
	Absent	748	99.73%
Stye	Present	7	0.93%
	Absent	743	99.07%
Conjunctivitis	Present	15	2.00%
	Absent	735	98.00%
Allergic eyes	Present	13	1.7%
	Absent	737	98.3%
Cataract	Present	1	0.13%
	Absent	749	99.87%

Discussion:

A total of 20,389 children with age range from 5 years to 17 years (mean 9.7 years) were screened by the teachers. Out of these screened children 750 (3.67%) were brought to our hospital. In our study, Prevalence was 3.67% which is comparable to Gul A[9] (3.55%), Haq Nawaz[10] et al (4.38%), Asif [2] et al (7.6%) and Arif and Qamar[11] et al (8.99%). Haseeb from Karachi reported 10.9% morbidity in school going children ever checked during ophthalmic examination.[12] Shoba Misra noted 14.8% in urban primary school of south India[13], and Wedner SH et al 15.6% in rural area Tanzania[14]. Khalil reported high prevalence 22.23% in school going children of District Lasbella.[15]

There were 423 male and 327 female children. This is in comparison with a study done in Gujarat, India in which Prajapati et al also demonstrated ocular morbidity more in males as compared to females.[16] Age distribution revealed that maximum number of children was from 7-10 Years of age i-e 277(36.9%), followed by 11-14 years of age 225(30.00%). This is in comparison with a study done by Naik R et al who showed a mean age of 9.5 years.[17] A written proforma was filled at every child who was screened and referred to the hospital. Major presenting complaint was watering from eyes (36.3%) followed by itching in the eyes (27.6%), pain (18.9%) and Headache (18.4%). Meundi AD etal also demonstrated that the most common symptom was persistent headache (1.7%) followed by watering of eyes (1.5%).[18]

Past ocular history revealed that 13(1.7%) out of 750 referred children were wearing spectacles while squint was present in 9 (1.2%). The most commonly encountered condition was refractive errors which were present in 153(20.4%) children followed by Squint 120 (16%) children. Conjunctivitis was also seen in 15 (2.00%) children and allergic eyes were 1.7% of screened and referred children. This is in comparison with a study done in Faisalabad which shows 18 % refractive error in boys and 82% in girls, cataract (0.1%), squint (0.06%) and (0.02%) ptosis. Other identified ocular problems were chalazion, blepheritis, corneal ulcer/ opacity, conjunctivitis.[19] Refractive errors remained most common problem in our study. Dandona et al estimated that 12.3% total blindness was due to uncorrected refractive errors, which is also responsible for a large number of blind years lived by a person than most other causes if left uncorrected.[20] In Another study it was estimated that blindness due to refractive errors resulted on an average of 30 years of blindness for each person as compared with 5 years of blindness due to untreated cataract for each person.[21]

Conclusion:

Early recognition of ocular problems by regular screening of students leads to prevention and prompt treatment of ocular diseases. Primary school teachers in collaboration with eye health workers are extremely helpful in screening common eye diseases in children in the community.

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ORIGINAL ARTICLE

Computer Vision Syndrome: Pre and Post Treatment Assessment of Computer Users

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ABSTRACT

Objectives: The objective of the study was to assess ocular problems in individuals associated with computer and visual display unit uses and to assess the effect of therapeutic interventions on computer vision syndrome symptoms among computer users.

Materials and Methods: This pre and post Interventional study was conducted among the software houses of Rawalpindi and Islamabad. The total duration of the study was 6 months. A sample of 338 was calculated. All the study subjects were randomly recruited from the selected Software houses.

Results: The results of the study showed that out of 338 about 70.4% had headache, 50.9% have tired eyes, 33.1% have blurred near vision, 23.1% have blurred distance vision, 29.9% have glare problem, 45.9% have dry eyes, 57.4% have Itchy and Burning eyes, 40.8% have Red eyes, 26.3% have Lower back pain, 68.3% have Neck and Shoulder pain and 12.1% complained of Diplopia while working on VDUs. Pearson Chi Square test shows a highly significant results regarding reduction in symptoms with the use of Anti Reflective coating and UV coated lenses (p value <0.05). Pearson Chi Square test also revealed a high and statistically significant association between, reduction of symptoms and working hours on computer use (p value <0.05). There was a statistically significant increase in Post Tear Break up Time after intervention has been given to the patients from time 1(M=7.69, N=338 and SD3.274) to time 2 (M=9.24, SD=2.845, N=338), t =-17.048 with a p value of < .000 (two tailed).The mean increase observed were ranging from -1.732 to 1.374 with CI (Confidence Interval) at 95%.

Conclusion: The conclusion of the above study was that CVS related symptoms related to VDUs use can be prevented or reduced, by simply prescribing antiglare glasses with UV coatings and by providing the significant lubrication to ocular surface along with environmental modifications. *Al-Shifa Journal of Ophthalmology 2018; 14(3): 133-140.*

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Introduction:

Computer Vision Syndrome, likewise eluded as Digital Eye Strain, portrays a gathering of eye and vision-related issues that outcome from prolonged computer, tablet and mobile phone usage. Numerous people encounter eye distress and vision issues when focusing on digital screens for prolonged periods. The level of distress seems to increment with the measure of digital screen utilize. The most well-known manifestations associated with Computer Vision Syndrome (CVS) or Digital Eye Strains are eyestrain, asthenopia, headache, blurred vision, red and scratchy eyes, dry eyes with foreign body sensation, neck and

shoulder pain. These side effects might be caused by poor lighting, glare on a digital screen, improper viewing distances, poor seating posture, uncorrected vision problems or a mix of these elements. Increased use of computers has led to an increase in the number of patients with visual grumblings which are being grouped together as Computer Vision Syndrome (CVS).[1]

Extended utilization of computers has prompted an expansion in the quantity of patients with visual grievances which are being gathered together as Computer Vision Syndrome (CVS). This newly discovered substance, habitually specified in the World Wide Web is presently being acknowledged in therapeutic literature.[1-3] The Occupational wellbeing and wellbeing organization division of the US Govt. Occupational safety and health administration [OSHA] has characterized CVS as a complex of eye and vision issues that are experienced amid and identified with computer uses; it is a dreary strain issue that seems, by all accounts, to be developing quickly, with a few examinations evaluating that 90% of the world 70 million people groups utilizing computers for over three hours for each day encounter CVS in some form. [2] The Visual show unit pictures are comprised of pixels or dabs; the determination being measured in dabs per inch. Prolonged work on computers has been related with lessened energy of settlement, expulsion of close purpose of union and deviation of phoria for near [4], [5] and these progressions are probably transient.[6, 7] The computer-related vision side effects have been separated comprehensively into four principle classifications, through asthenopia, visual surface related, visual and additional visual. [8] The centering frameworks of human eyes react flawlessly to the pictures that have all around characterized edges with great foundation differentiated. (e.g.: strong dark letters on white foundation). The eyes concentrate on the plane of the computer screen however can't maintain that core interest. At that point it will unwind on to a concentration behind the screen. This point is known as the resting point of accommodation (RPA). RPA is not quite the same as individual to individual, yet it is to some degree away than the ordinary working separation to the computer. Hence the eyes are always unwinding to RPA and straining to refocus on to the screen continually. The steady changing of centering by the ciliary body makes weariness to the eye and causes accommodative indications relating to CVS.

Due to an ever-increasing number and applications of VDUs in daily life the burden of CVS is proposed to increase at an exponential rate. As no such study has been done on this scale on CVS within twin cities the aim of this aim of this study was to describe the complaints and problems faced by VDU users in detail as well as to evaluate the effect of currently known management regimes which are easily available and affordable for the VDU users for this condition in the twin cities.

The main objectives were to assess ocular problems in individuals associated with computer and visual display unit uses i.e. Asthenopia, strain dry eyes, red eyes etc. and to evaluate the effect of therapeutic intervention on CVS symptom among computer users in software houses of Rawalpindi/Islamabad.

Subjects and Methods:

It was a pre and post Interventional study among individuals those who were working in Software houses of Rawalpindi and Islamabad. The study duration was six months from September 2016 to February 2017. The study was conducted after approval had been accorded by the hospital ethical committee. A Sample size of 338 was calculated using Open Epi online software at 67.2% prevalence. Established software houses of Islamabad and

Rawalpindi were included as a study population on convenient basis. The list of IT employees of every software house included in study was obtained and filtered according to the inclusion and exclusion criteria and merged into a final list. Respondents were then randomly selected through computer generated random number system from the final merged list. Individuals from both genders of age group 20-40 years using computers or e-tab more than 3 hours a day were included. Individuals with any ocular pathology, trauma, and systemic disorder and having use of antipsychotic or antihypertensive drugs were excluded.

All the respondents were assessed subjectively based on their symptoms of ocular fatigue and asthenopia and objectively through tear break up time (TBUT). The data was obtained from all respondents and they were advised intervention afterwards which consisted of

1. Use of lubricant with minimum preservatives.
2. Use of double surface coated anti reflective lenses
3. Taking break according to the convenience during VDU use
4. Health education to improve compliance

Two follow ups of three months each were done and TBUT and as well the proforma involving subjective symptoms was filled from every respondent on both follow ups.
Data analysis was done using Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics like frequency and Cross Tabulation was presented for gender, types of VDUs, working hours and efficacy of treatment modalities. Mean and standard deviation had been calculated for numerical variable i.e. Tear Break up Time Chi squared test was used for finding association between variables and paired sample t test was used for comparison of before and after TBUT.

Results:

A total of 338 patients having computer vision syndrome were included in the study. The age of these patients were from 20-40 years divided into four age groups. Out of 338, majority respondents (212) were male. Out of 338 about 70.4% feels headache, 50.9% have tired eyes, and 33.1% have blurred near vision. Other problems are listed in Figure 2. Almost 64% of the individual worked 6 hrs daily on computer at workplace followed by 32% are those who work about 6-8 hours and the remaining greater than 8 hours. Smartphone use was about 61.5 % more than three hours continuously during a day.

Pearson Chi Square test showed a highly significant results regarding reduction in symptoms with the use of Anti Reflective coating lenses. The value of Chi square test results was 6.398^{a} with a degree of freedom of 1 and a p-value of 0.011(Pearson Chi Square) test also shows a strongly significant association between working hours on computer use in symptoms reduction. Those who take break after 30 minutes recover 100% with treatment. The success rate of symptoms reduction in those who take break after 1 hour also shows 59.0% reduction in symptoms while symptoms reduction in peoples those who take break >1 hour shows 37.8% reduction in symptoms compared with other groups. Pearson chi Square score was 15.458^{a} with a degree of freedom of 2 and a P value of .000, showing strongly significant results.
A paired sample t-test was conducted to evaluate pre and Post Tear break up time after treatment with lubricants in computer vision syndrome in conjunction with Antiglare glasses. There was a statistically significant increase in Tear Break up Time after intervention has been given to the patients from time 1 to time 2 (table 2). The mean increases in PTBUT with a 95% confidence interval ranging from -1.732 to -1.374.

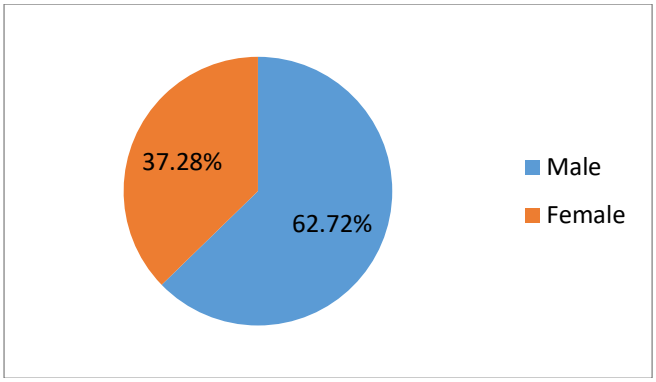

Figure: 1 Gender Wise Distribution (n= 338)

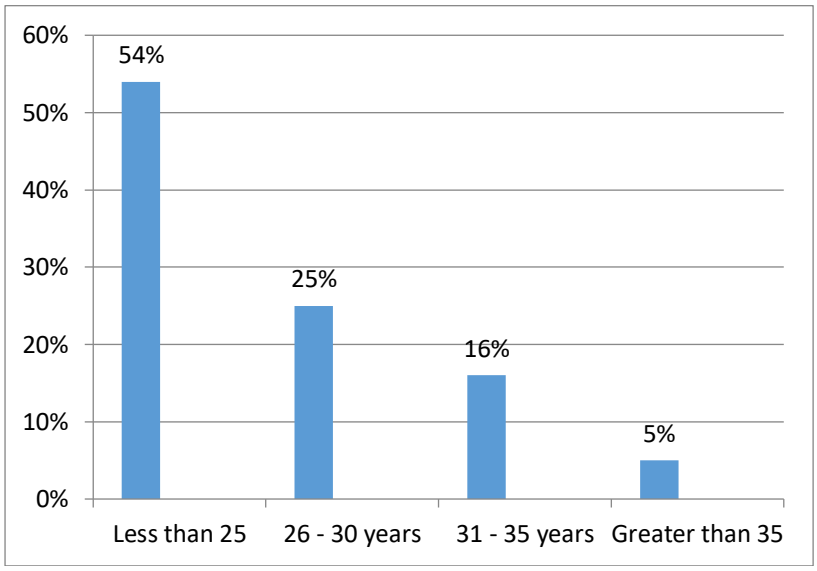

Figure: 2 Age wise Categories (n= 338)

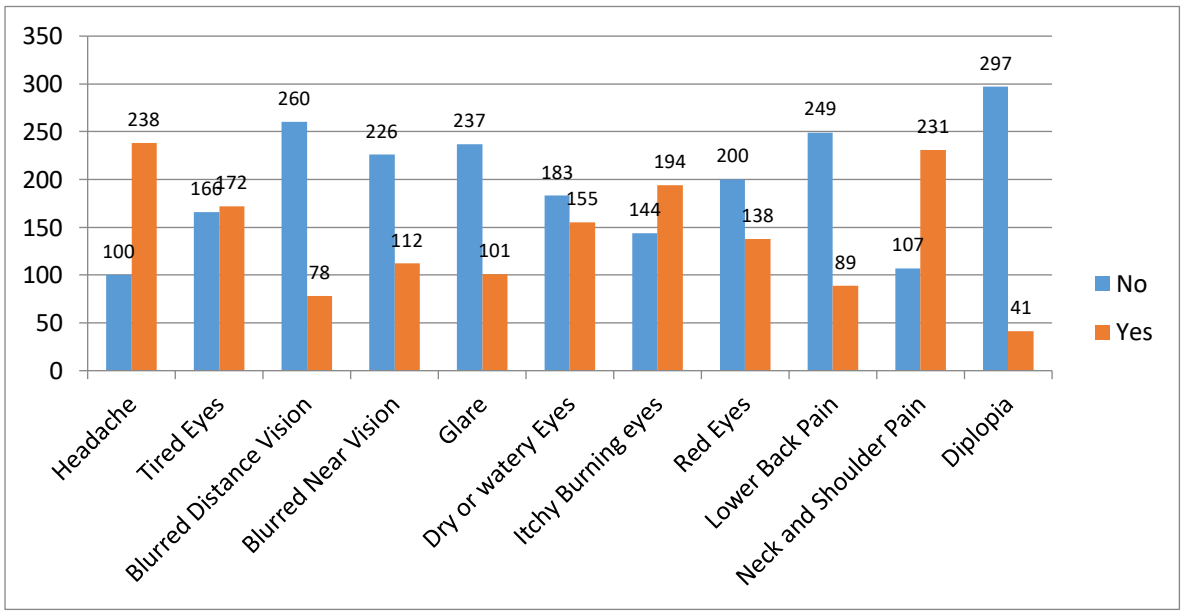

Figure: 3 Graphical representation of Problems associated with computer vision syndrome (n=338)

Table:1 Association between Break during working hours and reduction in symptoms

Break during working Hours	Reduction in Symptoms		X^2(df)	p-value
	Yes N(%age)	No N(%age)		
30 min	0(0)	8(3.2)	15.46(2)	0.001
I Hour	35(39.3)	147(59)		
More than I hour	54(60.7)	94(37.8)		

Table 2. Pre and Post TBUT paired t test results

	Paired Difference					t-value	dF	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre Tear Break Up Time – Post Tear Break Up Time	-1.553	1.675	0.091	-1.732	-1.374	-17.048	337	0.001

Discussion:

The present study was conducted among 338 individuals working at software houses of Rawalpindi and Islamabad. Out of 338, 62.7% were male and 37.3% were females. The high prevalence of headache was found around 70.4% people incorporated into our study. A study in India was directed among Medical and Engineering understudies appearing around 45% of understudies announced headache. The distinction is because of the calling and the other may be the time term with respect to the set of working responsibilities of understudies and software houses engineers. [8] Another study by Sen and Richardson, announced 61% among undergraduates. [9] The results of our study were sufficiently close to that of study cited previously.

The study demonstrated that 50.9% individual had tired eyes, 33.1% had blurred close vision and 23.1% had blurred separation vision. A study in India demonstrated that almost 31.6% understudies revealed obscuring of vision [8] while it was 13.2% in other studies. [10] Other examinations likewise underpin the relationship of blurred vision with computer use. [11, 12, 13]

The Prevalence of dry eyes in our study was 45.9%. Similarly, higher prevalence of dry eyes among office workers has been observed in other studies. [14, 15] Our study demonstrated that there was a statistically critical distinction in prevalence of dry eyes between the individuals who invest more time on VDUs compared with the individuals who invested less time in VDUs. Another study among building and therapeutic understudies demonstrates that the designing understudies were at more danger of creating dry eyes compared to the restorative students. [8] The reduction of 60% in blink rates while sitting at a computer screen adds to poor tear generation and incidentally focuses on the cornea, bringing about dry eyes. [16] To make the outcomes straightforward regarding dry eyes in our study the additional time spent before VDUs the more the cornea uncovered the more the vanishing happens and prompts Dry Eyes.

Our study demonstrated that the prevalence of red eyes among software house laborers was 40.8%. A comparable outcome was recorded by Shrivastava and Bobhate, and Talwar et al demonstrating a higher prevalence of 40.2% and 40.7% manifestation of redness among computer experts respectively. [9, 17] The after effects of study cited above demonstrated marginally extraordinary outcomes from our own however the distinction here was again a similar that the time length of individual incorporated into our study was more than the individual incorporated into the above study

The prevalence of burning sensation in our study was found around 57.4%. A study was discovered that demonstrated that about 42.8% people detailed burning sensation. [8] Lower prevalence of 28.9% was accounted for by Talwar et al.[10] while Sen and Richardson, detailed 55% among undergraduates. [9] Comparable finding of 54.6% of prevalence of burning sensation was accounted for by Costa et al., among call focus laborers in Brazil.

Our study demonstrated that the prevalence of neck and shoulder pain was impressively high of as much as 68.8% compared with bring down back pain that was 26.3%. The consequences of a distributed study demonstrated that about 61% of the understudies utilizing computers had detailed neck and shoulder pain. [8] Comparative discoveries were accounted for by Wahlstrom, in their study. [19] Our study comes about additionally demonstrated that the individuals who spent more circumstances before any VDUs encountered more neck and shoulder pain compared to others. Jacobs and Baker have revealed in their study a noteworthy relationship between the quantity of hours on the computer and general musculoskeletal distress. [27]

Our study demonstrated a statistically critical contrast in issues in people regarding taking a shot at VDUs. The more they take a shot at VDUs the more the issues of CVS they feel. A study distributed universally found that an expansion in the quantity of hours spent on computer builds the danger of CVS significantly.[8] Statistical significance was seen for redness, burning sensation and dry eyes, yet not for other symptoms. [8] Respondents who spend under 1 h on computer every day announced the most reduced visual symptoms. [23] Shrivastava and Bobhate report found that visual side effects expanded with the expansion in working hours on the computer. Another study had been accounted for by Rahman and Sanip, that those respondents who utilized computer for more than 5 h/day were at higher danger of creating CVS. [24]

Pearson Chi Square test demonstrates exceedingly significant outcome in regard to reduction in manifestation with the utilization of Anti Reflective and UV coating lenses. The individuals who enjoy reprieve following 30 minutes recoup 100% with treatment. The achievement rate of symptoms reduction in the individuals who enjoy reprieve following 1 hour additionally indicates 59.0% reduction in symptoms while symptoms reduction in people groups the individuals who enjoy reprieve >1 hour demonstrates 37.8% reduction in symptoms contrasted and different groups. An Internationally published study on CVS among undergraduates reported that the individuals who enjoyed frequent reprieve were at bring down danger of creating symptoms of CVS looked at the individuals who did not take. [8] A think about by Cheu RA among 1000 PC specialists demonstrated a reduction in the symptoms of asthenopia by enhancing ergonomic work area and frequent work breaks. [25] Taking short breaks of 5 min for consistently has been appeared to diminish uneasiness (eye and musculoskeletal) while not hindering productivity. [26, 27]

A paired sample t-test was led to assess pre and Post Tear break up time after treatment with lubricants in PC vision disorder in conjunction with Antiglare glasses. There was a measurably significant increment in Tear Break up Time after intercession has been given to the patients from time 1 t time 2. A worldwide investigation by Akinbu TR demonstrated that Symptoms caused by dry eyes can be mitigated by lubricating drops. [27]

Health and Education professionals have suggested the need for teachers and students and office workers to be ergonomically conscious when using computers [8]. As the use of computer had become universal in today life, the subject of the prevention of CVS and associated discomfort should be made part of the company policies and organizational bodies to improve the productivity by improving the awareness knowledge and health status of the individuals from prevention of Computer Vision Syndrome.

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ORIGINAL ARTICLE

Knowledge and Practices Regarding Contact Lens Wear and Care Among Contact Lens Users in Twin Cities of Pakistan

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ABSTRACT

Objective: To assess the knowledge level of the lens users and to find out various practices regarding handling and care of contact lenses.

Subjects and Methods: A cross sectional study was conducted in Rawalpindi from January till June 2018 on 200 individuals of both genders. An online generated structured questionnaire about knowledge and practices regarding contact lens (CL) was asked to be filled by the users aged 15-55 years, who gave a prior consent for participation in the study

Results: Out of 200 CL users majority were females (170, 85.2%), and 53% of users had completed their graduation. Majority of respondents (78.5%) used CL for correction of refractive error. Duration of use is 9-12 hours a day by 41% of the respondents. Lubricating eye drops were considered necessary by 45% of the users. No consultation or guidance was sought by 89% of contact lens users regarding CL. Almost 33% individuals accounted that they still wear the lens even after it fell on the ground or in washbasin. Approximately 19% individuals use running water to wet their lenses while 7.4% users put CL in their mouth to moisten them. Overall 34% and 38% contact lens users had poor knowledge and practices regarding contact lens wear and care.

Conclusion: Out of 200 contact lens users, 34% users had poor knowledge and 38% had poor practices regarding contact lens wear and care. *Al-Shifa Journal of Ophthalmology 2018; 14(3): 141-147.*

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Introduction:

The incidence of refractive error and visual impairment is increasing alarmingly throughout the globe. Contact lenses are thin optical devices that are most commonly used modalities for the correction of refractive error and for cosmetic enhancement and various therapeutic uses.

According to a survey conducted in 2004, about 125 million people around the world use contact lenses for refractive index correction or for cosmetic uses.[1] Aesthetics of a person is improved by the use of contact lens so that CL are getting more in demand among the school, college and university students and young working adults.[2] In 2010, worldwide estimated

market of contact lens was $6.1 billion.[3] Most suitable and recommended alternative to correct the refractive errors are contact lenses as they provide better peripheral vision, they eliminate the prismatic effect of spectacles. Although the use of contact lens use is increasing, but the contact lens users are not known about its good care and hygiene.

Contact lens related ocular complications are rising like dry eye, conjunctivitis, keratitis, corneal ulcers and blurred vision due to poor knowledge and compliance to the contact lens use protocol.[4,5] The most serious complication is corneal ulcer that is caused by bacterial and protozoal infections. Allergic reaction is caused by lens and lens cleaning solution. Fitting success is affecting by the complications of contact despite of valuable advancements in contact lens designs and materials.[6,7] Over the shelf and easy availability of these optical devices without instructions, are giving rise to complicated conditions. Knowledge regarding the contact lens care and hygiene among users plays an important role in prevention of these complications.[2] The major causes of contact lens complications are due to poor attitude and knowledge regarding proper contact lens care including cleaning by disinfection method and protein removal hygiene of hands, cleanliness of lens case and change of solutions regularly.[8]

Complications of contact lens due to poor behavior of users can be minimized by the correct knowledge in the careful practice regarding contact lens care and wear.[9] The study of knowledge can improve the effective health education and campaigns to reduce the complications of contact lens wear in our society. This study was conducted to assess the knowledge level of the lens users and to find out various practices regarding handling and care of contact lenses.

Subjects and Methods:

A cross sectional study was conducted in Rawalpindi from January till June 2018 on 200 individuals of both genders. An online generated structured questionnaire about knowledge and practices regarding CL was asked to be filled by the users aged 15-55 years, who gave a prior consent for participation. Questions regarding knowledge and practice of contact lens wear, care and hygiene were asked. The sample of the contact lens users was purposively drawn. At prevalence of 30% (Malaysian study)[2] Sample size was calculated by using formula z^2pq/e^2, P (Prevalence) =30%,[2] q is 100-p=70%, allowable error was kept as 5% of the prevalence (30%) that came out to be 6.25. After putting all the values in the formula z^2pq/e^2 = 1.96*1.96*30*70/6.25*6.25, sample size came out to be 200. Online-generated questionnaires were filled by the participants who were willing to participate in the study. 10-15 questionnaires were asked to be filled by the participants as a part of pilot testing prior to the data collection. Data was entered in SPSS for descriptive and inferential analysis. Descriptive analysis was done on demographic characteristics and knowledge and practices scores were computed and categorized into poor and good.

Results:

Out of total 200 participants most of them (63%) were in the age group of 20-29 years and majority of the total participants were females (85%). Of the 200 participants 107(53%) were graduate [Table:1].

Of the 200 contact lens users, majority of the participants were using contacts lens for the refractive error to avoid wearing the glasses. One hundred and seven participants (53.5%) had use of contact lens occasionally followed by weekly (28%). Majority of the participants (82%) wear

contact lens 9-12 hours on daily basis [Table: 2].

Of the 200 participants 41(20.5%) were aware about the over wear syndrome while 69 participants (34%) were not aware about the good cleaning practices of contact lens [Table: 4]. Of the 200 participants 178(89%) had not visited to doctor or contact lens practitioner to seek guidance regarding contact lens. Forty-five (22.5%) and 93 (46.5%) participants admitted that they don't wash and dry their hands thoroughly before touching the contact lens respectively [Table: 5].

Of the 200 participants 144 (72%) reported not to practice of rubbing of contact lens with fingers before soaking them solution. One hundred and sixty-six (83%) participants admitted not to replace lens case after certain time and 155 (79.5%) participants reported that they had no practice of rinsing lens case [Table:6]

Table: 1 Demographics of respondents (n=200)

VARIABLES		**DESCRIPTIVES** (n=200)	
		Frequency	**Percentage**
Gender	Male	30	15
	Female	170	85
	Total	200	100
Age	15-19 yrs	22	11
	20-29 yrs	126	63
	30-39 yrs	33	16.5
	40-49 yrs	15	7.5
	50-56 yrs	4	2
	Total	200	100
Education	Matriculation	4	2
	Secondary education	30	15
	Graduation	107	53
	Post-graduation	59	30
	Total	200	100

Table: 2 Contact Lens Usage (n=200)

VARIABLES		**DESCRIPTIVES**	
		Frequency	**Percentage**
Purpose of CL use	Refractive Error	157	78.5
	Cosmetic Use	43	21.5
	Total	**200**	**100**
Type of Refractive Error	Far sightedness (myopia)	172	86
	Near sightedness (hyperopia)	28	14
	Total	**200**	**100**
How often CL are used	Daily	37	18.5
	Occasionally	107	53.5
	Weekly	56	28
	Total	**200**	**100**
If daily usage then how many hours	3-5 hrs	45	22.5
	6-8 hrs	73	36.5
	9-12 hrs	82	41
	Total	**200**	**100**

Table:3 Knowledge and Practices regarding contact lens care and wear (n=200)

	Good	**Poor**
Knowledge	66.25	33.75
Practice	61.6	38.4

Table: 4 Knowledge Regarding Contact Lens Wear & Care (n=200)

Questions	**Good Knowledge**		**Poor Knowledge**	
	Frequencies	**%**	**Frequencies**	**%**
Over- Wear Syndrome	41	20.5	159	79.5
Hand Washing Before Wearing CL	185	92.5	15	7.5
Taking shower while contact lenses on	118	59	82	41
Use artificial tears	106	53	94	47
Response to Complications of eyes related to CL	167	83.5	33	16.5
Awareness of the contact lens good cleaning practices	69	34.	131	66
Clean the contact lenses	196	98	04	02
Monitoring of expiry date of CL & Solution	178	89	22	11

Table: 5 Practice regarding Contact Lens Wear (n=200)

Questions	Good Practice		Poor Practice	
	Frequencies	Percentages	Frequencies	Percentages
Visits to a doctor for CL guidance or treatment	22	11	178	89
Sleep with CL	163	81.5	37	18.5
Take a shower with CL	155	77.5	45	22.5
Wet CL in Tap Water	189	94.5	11	5.5
Put the CL in mouth to moisten them	185	92.5	15	7.5
Wear CL after they have fallen on the ground	137	68.5	63	31.5
Wear CL that have accidentally fallen in the washbasin	134	67	66	33
Wash my hands thoroughly before touching the CL	155	77.5	45	22.5
Dry hands before touching the CL	107	53.5	93	46.5
Apply makeup after wearing the lenses	118*	59	52	41
Continue to wear CL if you have experienced any of the complication	145	72.5	55	27.5
Use of Artificial Tears	97	48.5	103	51.5

*Attempted by Female Only

Table:6 Practices Regarding Contact Lens Care (n=200)

Questions	Good Practice		Poor Practice	
	Frequency	Percentage	Frequencies	Percentage
Rubbing of contact lens with fingers before soaking them in the solution	56	28	144	72
Swap contact lenses with another person	185	92.5	15	7.5
Replacement of lens case	34	17	166	83
CL case	160	80	40	20
Carefully cleaning of Contact lenses before storing them in the lens case	80	40	120	60
Keeping of contact lens case while going outside	74	37	126	63
Precautions taken before putting on contact lens	160	80	40	20
Change of Contact Lens Solution	192	96	08	04
Rinse of contact lens case	41	20.5	159	79.5

Discussion:

The current study showed the level of knowledge and practices related to contact lens wear and care among contact lens users of Rawalpindi, Pakistan. The results were as 34% respondents had poor knowledge regarding contact lens wear and care and 38.4 % had poor practice. The study conducted by Omar S. Al- Obaid///an reported 46% poor knowledge and 59% poor practice regarding contact lens use.[10] Majority of the contact lens users wear contact lenses to avoid the wearing of the spectacles and the average usage duration was 9-12 hours on daily basis. Study conducted by Tajunisah I reported that 8-12 hours a majority of the users were using contact lenses for 8-12 hours average in a day. Study conducted in Brazil reported 64% of respondents had use of contact lenses for more than 12 hours average in a day.[11] In this study, 79.5% participants were not aware of over wear syndrome. Study conducted by Purushottam A. Giri reported 53.5% were not known about the over wear syndrome. Difference may be due to the participants' education back ground in study of Purrushottam, medical students were included while in our study general population .[12]

Eighty nine percent users had not practice of seeking guidance from ophthalmologist or contact lens practitioner. Practice of sleeping and taking shower while wearing contact lenses were reported by 18.5 and 22.5% respectively. People with contact lens on while sleeping are more likely to have to eye complications. This results in corneal anoxia due to longer duration of contact of the lens on the cornea. In UK study conducted by Morgan et al showed that people who were sleep with contact lenses in the eyes were more likely to had a incidence of severe keratitis (96.4%) as compared to those who were not.[6] Feys in his study also showed 'overnight wear' is one of the important predisposing factors of bacterial keratitis.[7] Sleeping while wearing contact lens make users prone to corneal infection.[12]

Replacement of contact lens case and rinse it properly after a certain period was found very less as in current study 83% and 79.5 % had not practice of lens case replacement and rinse it properly. Contamination of the lens case and infection in contact lens wearers frequently associated with Non-compliance and poor practice of contact lens wearers.[13] Houang and co-workers reported improper cleaning of lens case is proved as a risk factor for ocular infection caused by Acanthamoeba.[14]

Practice of not discontinue of lens after experiencing ocular problems was reported by 27.5% contact lens users and 63% users had not habit of keeping lens case while moving outside with wearing contact lens. Study conducted by Tajunisah I et al reported that despite of symptoms still 14% students were willing to continue contact lenses.[2]

In our study 5.5% used tap water to wet their contact lenses which is similar to the study conducted by Hannan A and 94.5% used contact lens solution which is similar to study conducted by Yee et al in which 94.4% used lens solution to wash their lens.[15,16]

Conclusion:

Out of 200 contact lens users, 34% users had poor knowledge and 38% had poor practices regarding contact lens wear and care. Noncompliance and less awareness with the CL protocol were widespread among the users in our society. This behavior calls for focused health education and awareness programs for the consumers to prevent the risk of complications.

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ORIGINAL ARTICLE

Cystoid Macular Edema Following Uncomplicated Cataract Surgery; Extracapsular Cataract Extraction Versus Phacoemulsification

Aftab ur Rehman[1], Asif Mehmood[2], Irfan Aslam Khattak[3], Amer Shahzad[4], Maheen Akbar[5]

ABSTRACT

Objective: To compare the frequency of CME, diagnosed on Optical Coherence Tomography, 6 weeks after cataract extraction, in patients after ECCE versus phacoemulsification.

Materials and Methods: This study was carried out at Lahore General Hospital, Lahore in 6 months. It was a randomized controlled trial and sampling technique was non-probability purpose sampling. Patients fulfilling the inclusion criteria were included. A total of 200 cases were selected and were divided randomly by lottery method into 2 Groups. Group A included those who had to undergo ECCE and B included those who had to undergo phacoemulsification. The diagnosis of CME was established on Optical Coherence Tomography.The collected data was analysed statistically by using SPSS version 16. Both groups were compared for CME by using chi-square test. P-value <0.05 was considered as statistically significant.

Results: In group A, minimum Central Point Thickness (CPT) was 120nm and maximum was 647nm with mean CPT of 215.68±131.997nm, while in group B, minimum Central Point Thickness (CPT) was 121nm and maximum was 503nm with mean CPT of 172.31±81.158nm. In group A, Cystoid Macular Edema (CME) was diagnosed in 23 (23%) cases, while in group B, Cystoid Macular Edema (CME) was diagnosed in 9 (9%) cases.

Conclusion: Frequency of CME (diagnosed on OCT) at 6th post-operative week is more in post ECCE patients than in post phacoemulsification patients. *Al-Shifa Journal of Ophthalmology 2018; 14(3): 148-153. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Cystoid macular edema (CME) following cataract surgery, also known as Irvine-Gass syndrome, is one of the most common cause of visual loss after cataract surgery.[1,2] It is a painless condition in which multiple cyst-like areas of fluid appear in the central retina (macula) with resultant macular thickening and is usually associated with blurred or distorted central vision.[2,3,4] Although the exact cause of CME is not known, it may accompany a variety of diseases such as retinal vein occlusion, uveitis, or diabetes mellitus. It most commonly occurs after cataract surgery [4] and has a peak incidence at four to six weeks following cataract surgery[5].

The underlying mechanism of CME is

pathologic hyper permeability of retinal blood vessels, particularly the retinal capillary bed. Increased vascular permeability results in extravasation of fluid, proteins, and other macromolecules into the retinal interstitium.[2] Usually, vision loss from cystoid macular edema is temporary and responds to treatment with topical anti-inflammatory medications. However, some cases respond poorly to conservative treatment and may develop permanent visual loss[6]. About 1-3 % of patients who have undergone cataract extraction will experience decreased vision due to CME during the first Post-operative year [4]. If the disorder appears in one eye, there is an increased risk (possibly as high as 50%) that it will also affect the second eye [4].

Several studies have been conducted in different parts of the world, to determine the incidence of CME following cataract surgery, but the results vary widely. Ursell et al reported a 19% incidence of angiographic CME following Phacoemulsification and concluded the incidence of CME to be similar to that of extra capsular cataract extraction (ECCE) [7]. Some studies state that the incidence of Angiographic CME after ECCE is 15% to 30% [8]. Mentes reported a 9.1% incidence of angiographic CME after uncomplicated phacoemulsification[9]. It was hypothesized that there is a difference in the frequency of CME after phacoemulsification and that after extra capsular cataract extraction (ECCE). This present study aims to compare the frequency of Cystoid Macular Edema (CME), diagnosed on Optical Coherence Tomography, 6 weeks after cataract extraction in patients after extra capsular Cataract Extraction (ECCE) versus Phacoemulsification.

Material and Methods:

This study was carried out at Lahore General Hospital, Lahore in 6 months. It was a randomized controlled trial and sampling technique was non-probability purpose sampling. Patients fulfilling the inclusion criteria were included. A total of 200 cases were selected and were divided randomly by lottery method into 2 groups. Group A included those who had to undergo ECCE and B included those who had to undergo phacoemulsification. The collected data was analysed statistically by using SPSS version 16. Both groups were compared for CME by using chi-square test. P-value <0.05 was considered as statistically significant. Patients of either gender, having age 20-70 years, who underwent cataract surgery, without any complication i.e. Posterior Capsular rent with or without Vitreous loss, (diagnosed per-operatively on operating microscope) and Endophthalmitis (diagnosed on slitlamp examination or previous record) were included in the study. Whereas Patients having Pre-existing disease i-e Uveitis, Hypertensive retinopathy, Diabetic retinopathy and Retinal degenerations (assessed on slit lamp examination) were excluded**.** All the patients were operated by a senior consultant. The diagnosis of CME was established on Optical Coherence Tomography. All eyes were dilated before OCT examination. OCT scans were centered on fovea by providing a central, internal fixation mark, performed by one experienced operator. All this information was recorded through pre-designed proforma. The data was analysed statistically by using SPSS version 16. Quantitative variables like age, and centre point thickness were presented in the form of mean ± S.D. Qualitative variables like gender, cystoid formations and cystoids macular edema were presented in the form of frequency and percentages. Both groups were compared for CME by using chi-square test. P-value <0.05 was considered as statistically significant.

Results:

The male to female ratio in both groups is shown in figure no. 1. In group A, minimum age was 38 year and maximum was 80 year with mean age of 59.12±9.431

years, while in group B, minimum age was 40 years and maximum was 80 years with mean age of 55.73±8.37 years. In group-A minimum Central Point Thickness (CPT) was 120 microns and maximum was 647microns with mean CPT of 215.68±131.997microns, while in group B, minimum Central Point Thickness (CPT) was 121microns and maximum was 503 microns with mean CPT of 172.31±81.158 microns. In group A, cystoid formations were found in 23 (23%) cases. while in group B, Cystoid formations were found in 9 (9%) cases. In group A, Cystoid Macular Edema (CME) was diagnosed in 23 (23%) cases, while in Group B, Cystoid Macular Edema (CME) was diagnosed in 9 (9%) cases.

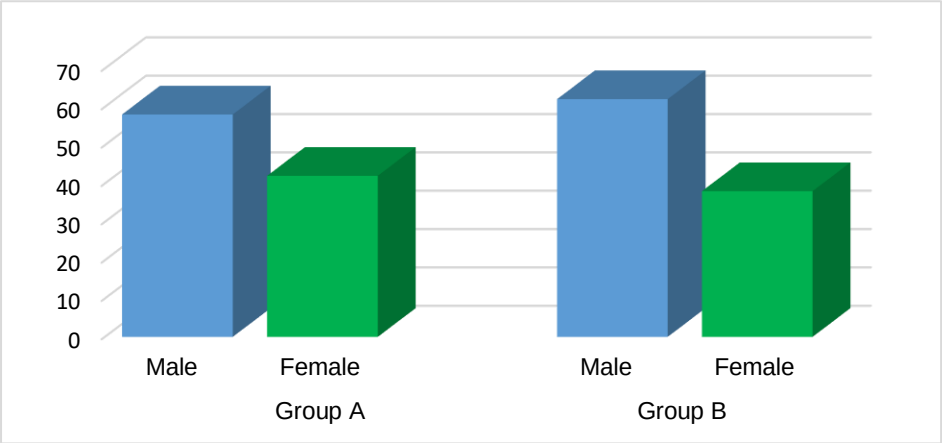

Figure no.1: Gender Distribution of the patients in two groups

Table 1; Descriptive Statistics of Age and CPT in the study

Variables	Mean ±SD	Range
Age	59.12±9.4	38-80 years
CPT (microns)	215.68±131	120-647

Table II. Comparison of Cystoids formations among both group

Cystoids formation	Group A	Group B	P-Vale
Yes	23	9	<0.001
No	77	91	
Total	100	100	

Discussion:

Cataract surgery has evolved tremendously over the past several decades, from large-incision intra-capsular cataract extraction to phacoemulsification. Despite surgical improvements, CME continues to be a common cause of postoperative visual disturbance[10,11]. Cystoid macular edema is likely caused by a breakdown in the blood–aqueous barrier due to various inflammatory mediators[12,13]. Mediators such as prostaglandins can cause leakage of perifoveal capillaries, which can lead to pooling of fluid in the outer retinal layers[14,15,16].

Although Phacoemulsification seems to carry better visual prognosis than ECCE, CME remains a problem following both types of cataract surgeries[17]. Controversies exist regarding the incidence of CME following either type of cataract surgeries, however, Phacoemulsification is considered to carry lower incidence rate than ECCE. The differences in rates may be caused by several factors, such as surgical technique, time of diagnosis of CME, variation in follow up times and rates of complications[17].

A study by Ferrari et al examined the association between CME and amount of energy delivered during phacoemulsification. They found that in patients who received more than one joule of energy, FFA revealed higher incidence of breakdown of blood-retinal barrier [18]. As we mentioned earlier that disturbance of retinal-blood barrier by inflammatory mediators leads to CME, thus, the more the trauma which results in release of inflammatory mediators, the more is the risk of CME. It is known that iris is a metabolically active tissue that releases inflammatory mediators when traumatized[17], thus cataract surgeries with iris trauma have higher incidence of CME [7, 19].

Some patient factors like age and sex, may also contribute to the formation of CME. Stern et al concluded that younger age group is more prone to CME following cataract surgery[20]. On the other hand, Rosetti et al concluded that older age group is more prone to CME following cataract surgery[19]. The results of our study were slightly different from the previous literature which stated that there was no sexual predilection for CME. The hypothesis, that the incidence of CME following phacoemulsification is lower than that following ECCE, was supported by our study, which showed lower incidence of CME following uncomplicated phacoemulsification than that following uncomplicated ECCE.

In our study, the incidence of CME, 6 weeks following phacoemulsification was 9%, which is similar to that mentioned by Mentes, in his study, who reported a 9.1% incidence of CME following uncomplicated phacoemulsification[9], however, our results were different from that concluded by Gulkilik *et al* , who reported a 25.5% incidence of CME following phacoemulsification[17]. The results were also different from that concluded by Belair who reported 4% incidence of CME after phacoemulsification[21]. In our study, the incidence of CME following uncomplicated ECCE was 23%, which is nearly equal to that mentioned by Ursell, in his study, who reported a 19% incidence of CME following ECCE[7]. Further studies are required to ascertain the incidence of CME following either type of cataract surgery, however, based on above results, post-phacoemulsification patients have lesser chances of development of CME than that following ECCE.

Conclusion:

The incidence of CME following uncomplicated phacoemulsification is

lower than the incidence of CME following ECCE.

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ORIGINAL ARTICLE

Results of FP7 Ahmed Glaucoma Valve Implant in Refractory Glaucoma Cases

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ABSTRACT:

Objectives: To report the clinical outcomes of FP7 Ahmed Glaucoma Valve (AGV) implant in refractory glaucoma cases.

Study Design: It was a prospective, non-comparative, interventional case series, conducted at glaucoma clinic of Al-Shifa Trust Eye Hospital, Pakistan between July 2016 to June 2018.

Subjects and Methods: All refractory glaucoma cases, which were treated with Ahmed Glaucoma Valve implant and completed at least one year follow up were included in this study. All cases were performed by a single surgeon using a standard technique. Pre-operative and post-operative visual acuity status and intraocular pressures were recorded as well as any complications encountered during the first post-operative year. All the data was entered on proformas and statistical analysis was done using SPSS version 21.0.

Results: A total of 34 eyes of as many patients were included. Pre-operative mean IOP was 29.76 (±8.14) mm of Hg while post-operative mean IOP was 14.97 (±4.65) mm of Hg. At one-year post-operative period, IOP was successfully controlled in 19 (55.88%) eyes without any additional antiglaucoma medicines, 14 (41.17%) eyes required additional post-operative anti glaucoma medicines while one eye underwent selective diode laser cycloablation. Hypertensive phase was noticed in 24 (70.58%) eyes which was managed by different methods. Post-operative complications included transient hypotony in 6 (17.64%) eyes, Choroidal detachment in 4 (11.76%) eyes, Tube exposure in 2 (5.88%) eyes and iris incarceration in tube in 1 (2.94%) eye. Drop in visual acuity was experienced in 3 (8.82%) eyes.

Conclusion: The overall success rate of FP7 AGV is comparable to that of prior studies using different models of AGV. The incidence of serious and long-term postoperative complications is low after FP7 AGV insertion. *Al-Shifa Journal of Ophthalmology 2018; 14(3): 154-160. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Glaucoma is the leading cause of irreversible vision impairment worldwide and it is projected that by the year 2020, there would be 79.6 million patients affected from Primary Open Angle Glaucoma (POAG) and Primary Angle Closure Glaucoma (PACG). [1] Management options in glaucoma can broadly be classified into Medical, Laser and Surgical. The choice of treatment depends on various factors related to the type of glaucoma, stage of the disease and factors related to patient like affordability, compliance, accessibility to health care system etc. The response of disease to a treatment option is also variable in different patients.[2]

Glaucoma is termed as refractory when the target intraocular pressure (IOP) is not achieved despite the maximum tolerable medical therapy and routine surgical procedures like trabeculectomy. Management of such glaucoma is more challenging, especially when the patient has got a good visual potential. The use of antimetabolite augmented trabeculectomy and glaucoma drainage implant are two procedures often considered in managing such patients with an aim to increase aqueous outflow.[3] Other options include procedures like diode laser cycloablation which reduces the rate of production of aqueous humour and thus helps to control the IOP. Factors that influence the choice include reason for treatment, visual potential, prior treatments, glaucoma type, surgeon preference, and patient preference.[4]

Drainage procedures, such as antimetabolite augmented trabeculectomy, may be associated with several complications, like hypotony, bleb leaks, and lifelong risk of endophthalmitis. Glaucoma drainage devices have been shown to be an effective method of IOP control, but their use may also be fraught with complications like hypotony, choroidal detachment, tube exposure, corneal decompensation etc.[5] Ahmed Glaucoma valve (New World Medical, Rancho Cucamonga, California) is a tube shunt that has got a valve mechanism to prevent complications like hypotony and related complications like flat anterior chamber or choroidal detachments. Although such risks are minimized with this mechanism, but cases are reported in literature where transient or persistent hypotony was encountered in the postoperative period.[6] FP7 model of AGV has a flexible plate that allows ease of insertion of the plate.

The current study was conducted to report the clinical outcomes of FP7 Ahmed Glaucoma Valve implant in adult refractory glaucoma cases treated at a tertiary care hospital in Pakistan. Results from such studies are helpful to provide useful insight regarding the relative risks and benefits of the procedure. Moreover, the results also help to identify the high-risk cases and such information is useful in deciding about choice of treatment in such cases.

Subjects and Methods:

It was a prospective, non-comparative, interventional case series, conducted at glaucoma clinic of Al-Shifa Trust Eye Hospital, Pakistan between July 2016 to June 2018. The study was conducted after approval of protocol by the ethical committee of Al-Shifa Trust Eye Hospital, Rawalpindi. An informed consent was obtained from all participants, according to the format approved by the ethical committee.

All adult refractory glaucoma cases, which were treated with FP7 model of Ahmed Glaucoma Valve implant and completed at least one year follow up were included in this study. Cases of congenital glaucoma as well as those in which any cyclodestructive procedure was previously performed were excluded.

"Refractory glaucoma" was defined as glaucoma, in which IOP remained uncontrolled despite maximum tolerable medical treatment, with or without previously performed trabeculectomy. Success was defined as achievement of IOP between 8 to 18 mmHg, on the last two visits, without any additional antiglaucoma medicine, with a decrease of no more than 2 lines in the visual acuity.

All cases were performed by a single surgeon using a standard technique. Fornix-based conjunctival flap in the superotemporal quadrant was fashioned and a 4 X 4 mm partial thickness scleral flap raised. Valve primed with balanced salt solution and implant Plate sutured to the sclera with a 5-0 ethibond, about 8 to 10

mm posterior to the limbus. Tube was trimmed beveled-up and inserted into the anterior chamber through a track under the scleral flap, which was then sutured with a 10-0 nylon suture. Conjunctiva was sutured finally to the limbus.

Pre-operative and post-operative visual acuity status and intraocular pressures were recorded as well as any complications encountered during the first post-operative year. All the data was entered on proformas and statistical analysis was done using SPSS version 21.0.

Results:

A total of 34 eyes of as many patients were included. Types of glaucoma in these eyes are shown in Table no. I. Pre-operative mean IOP was 29.76 (±8.14) mm of Hg and visual acuity ranged from 6/12 to 6/60. At one-year post-operative period, mean IOP was 14.97 (±4.65) mm of Hg. IOP was successfully controlled in 19 (55.88%) eyes without any additional antiglaucoma medicines, 14 (41.17%) eyes required additional post-operative anti glaucoma medicines while one eye underwent selective diode laser cycloablation for the control of IOP. Table no. II shows mean IOP at various visits and number of eyes that required additional antiglaucoma therapies.

Hypertensive phase was noticed in 24 (70.58%) eyes which was managed by different methods (Table no. III). Post-operative complications included transient hypotony in 6 (17.64%) eyes, Choroidal detachment in 4 (11.76%) eyes, Tube exposure in 2 (5.88%) eyes and iris incarceration in tube in one (2.94%) eye. Drop in visual acuity was experienced in 3 (8.82%) eyes. Percentage of various complications encountered in the post-operative period is shown in table no. IV. All cases of hypotony and choroidal detachment recovered spontaneously.

Table No. I: Types of Glaucoma included in the study

Types of Glaucoma	Number / Percentage of eyes
Primary Open Angle Glaucoma	9 (26.47%)
Pseudoexfoliation Glaucoma	7 (20.58%)
Primary Angle Closure Glaucoma	5 (14.70%)
Traumatic Glaucoma	6 (17.64%)
Neovascular Glaucoma	4 (11.76%)
Silicon Oil induced Glaucoma	2 (5.88%)
Pseudophakic Glaucoma	1 (2.94%)
Total	34 (100%)

Table No. II: Comparison of IOP at various visits

Time	**Mean IOP (mmHg)**	**SD (mm of Hg)**	**Range (mm of Hg)**	**Eyes on antiglaucoma Rx**
Preoperative	29.76	8.14	20-52	All
1 day	10.52	5.88	0 – 24	Nil
1 week	10.76	4.79	0 – 20	Nil
1 month	12.70	5.71	6-28	02
3 months	14.41	4.39	10-26	06
6 months	16.02	3.92	10-32	09
9 months	15.05	4.15	8-20	12 (+ 1 eye DLCA)
12 months	14.97	4.65	10-18	14

Table No. III: Management of Hypertensive Phase (n=24)

Management Options	Frequency of eyes (Percentage)
Topical medications	16 (66.66%)
Needling	4 (16.66 %)
Digital massage	3 (12.5%)
Diode Laser Cycloablation	1 (4.16%)

Discussion:

The results of this study show that FP7 implant is a safe and effective option for the control of IOP in refractory glaucoma cases. The control of IOP achieved with FP7 model of AGV in this study was comparable with the results reported in some of the other study. Mean IOP at 12 months follow up in this study was 14.97 (±4.65) mm of Hg which is comparable with the mean IOP achieved at the same follow up period in the study by Schimiti RB et al.[7]

Insertion of the AGV has been shown to be associated with hypertensive phase, a period in the early postoperative period during which there is a rise in IOP. Some studies have shown that this early IOP rise resolves spontaneously in a subset of patients. However, in a significant number of patients, antiglaucoma medications are required to reduce IOP control in the longer term. Encapsulation of the plate in the early postoperative period is proposed to be responsible for this early rise in IOP. The development of hypertensive phase has also been shown to be associated with higher final IOP.[8] Different studies report variable percentages of eyes experiencing this phase. Hypertensive Phase occurred in 70.5% in this study in comparison to 82% reported by Ayyalla al.[9] On the other hand, Nouri-Mahdavi have observed HP in 56% of patients.[10]

The percentage of various complications encountered in this study is compared with the results of other studies in table no. IV.[9,11,12] Hypotony was noticed in almost 18 % of eyes which is similar to the results of Aljazzaf et al[12]. Although a valve mechanism is incorporated in AGV, this may only partially prevent the incidence of hypotony in the early post-operative phase. Low IOP might also result from leakage of aqueous around the tube at the entry port. So, it is important to make the entry port just of adequate size to allow the insertion of tube into anterior chamber.

Choroidal detachment was observed in 4 (11.76%) eyes in this study. All these eyes had an axial length of more than 25 mm. In different studies, the occurrence of shallow anterior chamber after AGV implantation ranged from 10.6 to 19% and the presence of choroidal detachment ranged from 5 to 15%. [13,14]

Drop in vision was reported in 3 (8.82%) of eyes in the current study which was slightly more than the reported results of Ayyala et al.[9] However, Aljazzaf et al reported a drop of vision in 27% of eyes.[12] The difference might be related to the definition of "vision loss" in various studies. We considered a drop of at least 2 lines in visual acuity as loss of vision. On the other hand, Aljazzaf et al defined loss of vision as a drop of only one line in the visual acuity chart. This explains the higher incidence of vision loss in their study.

Table No. IV: Comparison of post-op complications

Complications	Ayyala RS et al[9]	Tai et al (S2 model)[11]	Aljazzaf et al[12]	Current Study
Hypotony	9.4%	6.59%	18%	17.64%
Hyphema	16.5%	12.77%	18%	17.64%
Serous Choroidal detachment	4.7%	5.32%	3%	11.76%
Tube exposure	7%	3.19%	3%	5.88%
Plate exposure	11.7%	2.12%	Nil	Nil
Tube block	4.7%	4.26%	18%	2.94%
Drop in vision	5.8% (2 lines drop)	Nil	27% (one Line drop)	8.82% (2 Lines drop)
Corneal decompensation	30%	Nil	6%	Nil
Iritis			6%	5.88%

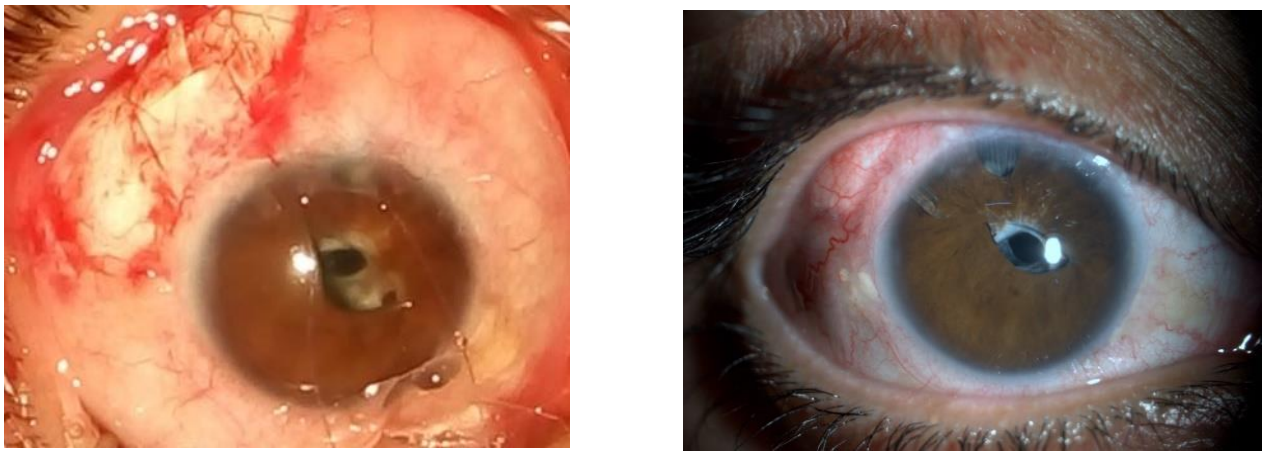

Fig No. 1a &b: Per operative and post-operative picture of a case of refractory glaucoma

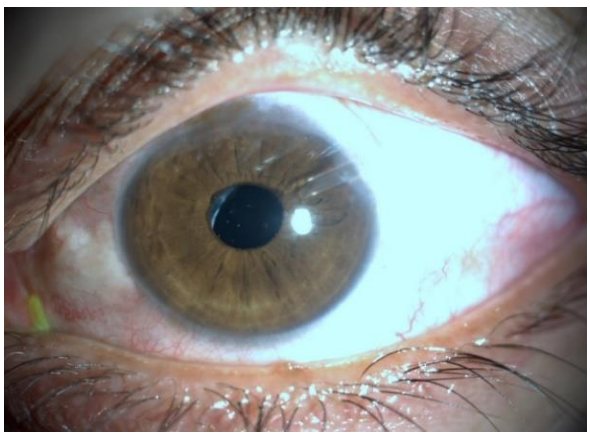

Fig No. 2: Post-operative picture

Fig. No. 3: Post-operative picture

Conclusion:

The overall success rate of FP7 AGV is comparable to that of prior studies using different models of AGV. The incidence of serious and long-term postoperative complications is low after FP7 AGV insertion. These complications can further be minimized by doing careful patient selection for the procedure and using a meticulous surgical technique.

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