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Al-Shifa Journal of Ophthalmology

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Editorial: Publishing in a Predatory Journal: An Ethical Dilemma 56
Ume Sughra

Efficacy of Supratarsal Injections versus Topical Steroids for Treatment of Vernal Keratoconjunctivitis In Children 58
Hamid ur Rehman, Tariq Shahnam, Irfan Aslam Khattak ,Waleed Ahmed, Nusrat Sharif, Shadab Hassan

This was a prospective comparative randomized case series in which a total of 90 eyes were included, divided into three groups. Group A included 30 eyes who received supratarsal injection of Triamcinolone acetonide 20 mg, Group B 30 eyes who received supratarsal dexamethasone 2 mg injection and Group C 30 eyes were prescribed topical Prednisolone acetate 1% eye drops. Resolution and recurrence of signs was compared.

Causes of Blindness in the Schools for the Blind 65
Saima Asghar, Qamar Farooq, Muhammad Faisal, Fuad Ahmad Khan Niazi

It was a cross sectional study conducted in two schools of Rawalpindi. A total of 254 students of two blind schools were screened for their visual status. Refraction was done and the advice for change of glasses, change of filter and a better suiting low vision aids (LVAS) was given to the students. Mild visual impairment was present in less than 1% cases, moderate visual impairment in (35.8%) and severe visual impairment was seen in (42.1%). Major causes of blindness and visual impairment are also reported.

Dry Eye Disease and Computers 72
Munir Amjad Baig, Rabeeya Munir, Waleed Munir, Shakeel Ahmad Faiz

It was a hospital based cross sectional study conducted at Federal Govt. Services Hospital Islamabad. Three hundred and three Federal Government computer operators working more than three hours daily and having five years of service attending OPD/ refraction clinics were enrolled. All subjects were divided into 3 groups while detailed eye examination and dry eye tests were performed. The frequency of computer vision syndrome and Dry Eyes is reported.

Impact of Diabetes Mellitus on the Variation of Central Corneal Thickness 78
Muhammad Sajid Munir, Muhammad Azhar Abbas, Nusrat Sharif, Shadab Hassan

This clinical study was conducted to validate the existence of a correlation between thickness of the central cornea and diabetes. A total of 930 patients were evaluated for measurement of central corneal thickness (CCT) by ultrasound pachymetry and eyes examination was done on the slit lamp. The sample was divided into two groups; 700 eyes of 350 non-diabetics and 1160 eyes of 580 diabetic patients. The average central corneal thickness in the diabetics and non-diabetics were compared.

Role of Optometrist in Management of Retinitis Pigmentosa 82
Mehwish Ali, Saima Suman, Ruhallah, Imran Ahmad,

This was a descriptive cross-sectional study. A sample size of total 31 retinitis pigmentosa patients was enrolled in this study. Patient profile and data were collected followed by assessing the patient for low vision, prescription of optical and non-optical devices and counseling of the patient. Frequency of various levels of visual impairment in Retinitis Pigmentosa is reported.

Efficacy of Enucleation Technique Using Westcott Scissors for Retinoblastoma – Sahaf’s Technique 87
Muhammad Sharjeel, Irfan Qayyum, Muhammad Saim Khan, Muhammad Sohail Arshad, Farhan Ali, Imran Akram Sahaf

This was a Quasi experimental study in which the patients who had unilateral or bilateral retinoblastoma with large tumor, non-salvageable vision and increased risk of metastasis were included. The surgical procedure was performed in supine position under general anesthesia in all patients. Optic nerve stump was measured with plastic rule after enucleation was completed. Age of the patients and laterality and length of optic nerve resected during the procedure is reported.

Publishing in a Predatory Journal: An Ethical Dilemma

Ume Sughra^{1,2}

1. *Al-Shifa School of Public Health*
2. *Al-Shifa Research Center*

Journals that lack the heart of prestigious scholarly journals that is peer review and editorial board are known as predatory journals. There are certain hallmark features of these predatory journals in addition to processing fee and lack of peer review. The journal's title includes national or international affiliation that does not match its editorial board, poorly maintained website, date for release of issue that never appears on due date and errors in titles and abstracts.^{1,2}

Ethical concerns related to publishing in predatory journals are:³⁻⁵

1. **Misrepresentation:** They lack transparency regarding article processing charges (APCs) and fail to reveal that they lack peer reviewing. They claim false impact factors and list the indexes they say their journal is listed in.
2. **Lack of publishing and editorial policy:** They don't screen the submitted work for plagiarized content, research ethics, authorship roles to identify ghost authors, funding and conflict of interest disclaimers.
3. **Academic dishonesty:** Sometimes authors deliberately publish their work in predatory journals for getting publications on their credit, seeking promotions and good jobs. Although it's difficult to determine that an author is knowingly publishing in a predatory journal, however publishing in such journals may raise certain questions and suspicions.
4. **Waste of funding and research work:** When a researcher gets his work published in a predatory journal knowingly or unknowingly and other people get to know about this, his research work is questioned, and the reputation is affected.
5. **Trust deficit in research work:** Predatory journals mostly publish bogus research which raises many public issues and creates trust deficit in research work. Readers who misunderstand the distinctions between legitimate and predatory journals may disregard all scientific research work.
6. **Unapproachable in archive:** Research content published in predatory journals may not be accessible in future and authors may find their work disappeared from the site.
7. **Lack of screening processes:** It makes it possible to publish plagiarized work since they don't have any screening policy and measures to check the plagiarized work.

In conclusion predatory journals pose a big threat to academic institutions, authors and publishers. They all have a shared responsibility to deal with this threat by supporting the legitimate and genuine scholarly research publications. Institutions shouldn't be having unrealistic and undue expectations from their employees and shouldn't drive them towards the number game of publications that ultimately leads to faulty decisions and shortcuts for speedy publications in these predatory journals.

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Efficacy of Supratarsal Injections versus Topical Steroids for Treatment of Vernal Keratoconjunctivitis In Children

Hamid ur Rehman¹, Tariq Shahnam², Irfan Aslam Khattak³, Waleed Ahmed¹, Nusrat Sharif⁴, Shadab Hassan⁴

Abstract

Purpose: Aim of the study was to compare efficacy of supratarsal triamcinolone acetonide injection, supratarsal dexamethasone sodium phosphate and topical Prednisolone 1% eye drops in the treatment of resistant cases of Vernal Keratoconjunctivitis (VKC) in children

Study design: It was a prospective comparative randomized case series

Place and duration: This study was conducted in Eye Unit Hayatabad Medical Complex Peshawar. Duration of study was 2 years.

Materials and Methods: A total of 90 eyes (45 patients) were included in this study. Symptoms and signs of vernal keratoconjunctivitis were recorded after which these eyes were divided into three groups. Group A included 30 eyes (15 Patients) who received supratarsal injection of Triamcinolone acetonide 20 mg, Group B with 30 eyes (15 Patients) who received supratarsal dexamethasone 2 mg injection and Group C with 30 eyes (15 Patients) who took topical Prednisolone acetate 1% eye drops. Patients were evaluated at regular intervals and resolution, remission and recurrence of symptoms and signs of VKC was noted.

Results: There was no statistically significant difference in remission of sign and symptoms between triamcinolone acetonide and dexamethasone phosphate injections group ($P < 0.05$) but the supratarsal injections group showed effective remission of signs and symptoms of VKC in comparison to topical steroids group. Eyes in group A and B (Supratarsal Injections) had very low recurrence rate and delayed recurrence in comparison to group C (topical Prednisolone eye drops). Moreover, no complications of the procedure were noted in all groups.

Conclusion: Our study concluded that supratarsal injections of triamcinolone acetonide and dexamethasone phosphate are an efficacious, easy and safe technique in the management of treatment resistant VKC in children. *Al-Shifa Journal of Ophthalmology 2019; 15(2): 58-64.*
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Introduction:

The term Vernal, taken from Greek language meaning a “disease of spring”, is an intense type of ocular allergy¹. Vernal keratoconjunctivitis is a bilateral inflammatory disease which occurs in spring season and affects both children and adults². This disease is more common in warm and hot weather areas than the countries with cold weather. It frequently runs in family and males are more frequently involved than females, and nearly 80 % occur in patients below 14 years of age and resolution by late teens³. Management include prevention from the agents which activate the ocular allergy;

and topical and / or systemic medications⁴. Less severe cases can be treated with cold compresses, artificial tears, topical vasoconstrictors or topical antihistamines⁵. Topical and/or systemic steroids are used in severe cases.⁴ Immunomodulators like tacrolimus and cyclosporine are also used as steroid sparing agent⁶. Supratarsal injection of steroids has shown to be effective in VKC and is found to be a good alternative⁷.

Cobblestone papillae are pathognomic for VKC. Ptosis, Horner–Trantas dots, limbitis, new vessels formation, shield corneal ulcers can also be present in severe cases. The frequently occurring and often severe symptoms of VKC are irritation, watering, pain and photophobia. Intraocular pressure should be monitored in patients on steroids as possibility of raised pressure is present⁸. We receive patients having VKC from various parts of our province .we usually see patients who are refractory to conventional treatments and different options are already tried. The use of supratarsal steroid injection has shown good results in severe and refractory cases of VKC.^{9,10}

To our knowledge there is limited data available on supratarsal injection of triamcinolone in VKC in our province. Therefore, we designed this study to compare the role of supratarsal steroid injections with topical steroids in severe and refractory cases in pediatric population

Material and Methods:

This prospective study was conducted at Ophthalmology department Hayatabad Medical Complex (HMC) Peshawar from 13th May 2017 to 12th May 2019 after approval from ethical committee of our hospital. Written informed consent was taken from guardians of all patients participating in study. They were divided into three groups. Group A included 30 eyes of 15 patients who received supratarsal injection of triamcinolone acetate; group

B included 30 eyes of 15 patients who received supratarsal injection of dexamethasone sodium phosphate; and group C included 30 eyes of 15 patients, who received topical prednisolone acetate 1% eye drops. All eyes included in this study were subjected to a detailed preoperative assessment of both anterior and posterior segments.

Inclusion criteria:

Severe, recurrent, and resistant VKC with corneal manifestations (superficial punctate keratitis, shield ulcer, vascularization, limbitis or pannus).

Severe VKC was defined as presence of shield ulcer, cobblestone papillae, limbitis and pannus. Resistance cases were defined as those who receive treatment for two weeks with the following topical medications: artificial tears (Hypromellose 0.3%) 3 times a day for 2 weeks and topical antiallergics (Olopatadine 0.1%) three times a day for 2 weeks, topical NSAID (Nepafenac 0.1%) three times per day for 3 weeks, avoidance of sunlight exposure by wearing dark spectacles, cold compresses and avoiding dusty environment. After two weeks patients were examined and resistance was defined as having one or more of the following symptoms and signs with the presence of one or more of the following manifestations by the end of the 2 weeks: continued symptoms (redness, itching, photophobia, watering , and ropy discharge), cobblestone papillae, limbitis, superficial punctate keratitis, unresolved shield ulcer and persistent vascularization. Parents of all children were informed about the purpose of the study and all the details about injections and topical steroids regimen in group A, B and group C.

Patients having infective corneal ulcer, poor compliance, children under 4 years of age, and patient having conjunctival scarring due to other disease were excluded. Those patients were included who full filled the criteria of inclusion. In group A and B

supratarsal steroids were given under mask anaesthesia and aseptic conditions. In these groups, lids were everted and 0.5 ml (20mg) of Triamcinolone acetonide injection was given in the space between conjunctiva and mullers muscle in Group A patients and 0.5ml (2mg) of dexamethasone sodium phosphate was given in group B Patients. A 27-gauge needle was used for injections. Group C received topical steroid prednisolone acetate 1 % eye drops 4 times a day for 2 weeks. Eyes were followed up at 1 day, 1 week, 1 month, 3 months, 6 months, and 12 months. Follow-up period started from the day of injection in groups A and B, and from the last day of topical steroid therapy in group C. Resolution of symptoms and signs, recurrence rates, and complications were evaluated and documented. Data was collected, tabulated, and analyzed using the paired t test.

Results:

The age of the patients ranged from 6 to 13 years (mean, 9.5 ± 3.1 years). The condition was bilateral in all patients who complained of the following symptoms: itching, photophobia, lacrimation, redness, and whitish ropy discharge.

Table I illustrates the distribution of the clinical signs of VKC in each group prior to any procedure, which had no statistically significant difference between groups ($P > 0.05$). The presence of clinical symptoms and signs with their resolutions or recurrences on the first day, first week, first month, third month, sixth month, and 12th month are listed in Table no. II and III. Resolution of symptoms in all groups started from the first day with no change in statistics among the three groups ($P > 0.05$)

till the end of the first month, in spite of the fact that group C had a slightly increased number of eyes showing resolution of papillae, limbal nodules, superficial punctate keratitis, and corneal pannus. After the first month, groups A and B showed a better resolution of symptoms in comparison to group C. There was no change in statistical data among groups A and B ($P > 0.05$). A significant statistical change was found among groups A and C ($P < 0.05$). A significant statistical change was found between groups B and C ($P < 0.05$). There were no statistically significant differences between groups regarding superficial punctate keratitis, shield corneal ulcer and corneal pannus ($P > 0.05$) till the end of the first month. However, this continued afterwards just in case of shield ulcer, while regarding other signs it was noticed that groups A and B had a better resolution of papillae, limbal nodules, superficial punctate keratitis, and corneal pannus in comparison to group C. There was no significant statistical difference between groups A and B ($P > 0.05$).

A statistically significant difference was found between groups A and C ($P < 0.05$). A statistically significant difference was also detected between groups B and C ($P < 0.05$). Regarding recurrence of symptoms and signs (Table III): in group C, recurrence started earlier (at 3 months) and it was significantly higher in comparison with the other two groups ($P < 0.05$). In groups A and B, recurrence started later (at 6 months) and it was significantly lower in comparison with group C. There was no statistically significant difference in recurrence rate between groups A and B ($P > 0.05$).

Table I: Clinical signs of VKC distribution in each group

| Clinical signs | Total eyes affected in group A | Total eyes affected in group B | Total eye affected in group C |
|-----------------------------------|--------------------------------|--------------------------------|-------------------------------|
| Papillae | 21 | 19 | 21 |
| Limbal nodules | 4 | 4 | 3 |
| Mixed papillae and limbal nodules | 4 | 6 | 6 |
| Shield ulcer | 3 | 3 | 3 |
| Punctuate keratitis | 9 | 10 | 11 |
| Pannus and vascularization | 11 | 12 | 12 |

Table II: Follow up 24 hours, 7 days, 30 days (following injection in group A and group B and starting of topical steroids in group C (Total number of patients 30)

| Data | 1 day | | | 7 days | | | 30 days | | |
|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | GA 30 | GB 30 | GC 30 | GA 30 | GB 30 | GC 30 | GA 30 | GB 30 | GC 30 |
| Resolution of symptoms | | | | | | | | | |
| Resolution of Papillae | 3 | 2 | 3 | 13 | 12 | 6 | 21 | 19 | 10 |
| Resolution of limbitis | 3 | 4 | 5 | 8 | 9 | 5 | 9 | 10 | 5 |
| Resolution of punctuate keratitis | 2 | 1 | 3 | 6 | 7 | 4 | 9 | 10 | 5 |
| Resolution of shield ulcer | 1 | 1 | 1 | 3 | 3 | 2 | 3 | 3 | 3 |
| Resolution of corneal pannus | 1 | 1 | 2 | 6 | 7 | 4 | 10 | 11 | 6 |
| Side effects and complications | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

GA, group A; GB, group B; GC, group C

Table III: Follow-up data at 3, 6 and 12 months

| Data | 3 months | | | 6 months | | | 12 months | | |
|-------------------------------|----------|----|-------|----------|-------|-------|-----------|-------|-------|
| | GA | GB | GC | GA | GB | GC | GA | GB | GC |
| Symptoms | | | | | | | | | |
| Resolution | 30 | 30 | 21 | 28 | 27 | 13 | 21 | 19 | 3 |
| Recurrence % | 0 | 0 | 22.5 | 3.75 | 7.5 | 41.25 | 22.5 | 26.5 | 67.5 |
| Papillae | | | | | | | | | |
| Resolution | 23 | 21 | 8 | 21 | 18 | 6 | 16 | 15 | 3 |
| Recurrence% | 0 | 0 | 16.07 | 7.26 | 12.93 | 32.17 | 21.77 | 23.27 | 53.57 |
| Limbitis | | | | | | | | | |
| Resolution | 9 | 10 | 3 | 7 | 7 | 1 | 4 | 3 | 1 |
| Recurrence % | 0 | 0 | 32.14 | 12.5 | 21.42 | 53.57 | 37.5 | 48.21 | 53.57 |
| Punctate Keratitis | | | | | | | | | |
| Resolution | 9 | 10 | 4 | 9 | 10 | 3 | 6 | 7 | 1 |
| Recurrence % | 0 | 0 | 10.71 | 0 | 0 | 32.14 | 24.99 | 21.42 | 53.57 |
| Shield Ulcer | | | | | | | | | |
| Resolution | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 1 |
| Recurrence % | 0 | 0 | 18.75 | 0 | 0 | 18.75 | 15 | 18.75 | 37.5 |
| Corneal Pannus | | | | | | | | | |
| Resolution | 11 | 12 | 8 | 8 | 9 | 3 | 6 | 6 | 1 |
| Recurrence % | 0 | 0 | 24.99 | 20 | 17.64 | 41.67 | 35 | 39.70 | 58.32 |
| Side effects and complication | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Discussion:

Vernal Keratoconjunctivitis is a highly prevalent ocular disease in hot and dry climates. Hot climate, sun light, male gender, poor socioeconomic status, exposure to hot air and dust, atopy, smoke from wood burning and contact with animals are the major risk factors^{11, 12, 13}. Supratarsal injection of 20 mg triamcinolone acetonide showed good results in treatment of severe VKC. It can be considered a safe treatment for resistant cases. Although complete resolution of the disease is seldom achieved but there was improvement in sign and symptoms following injection and decreased recurrence rate¹⁴. Commonly prescribed VKC treatment includes topical anti-histamine drugs, topical and systemic steroids, artificial tears, topical and systemic cyclosporine¹⁵. But these therapies are usually ineffective in the management of severe VKC. Due to this reason Supratarsal steroids injection was

used in our study for this debilitating and treatment resistant VKC. Holsclaw et al. stated that supratarsal injection of steroids revealed great improvement of symptoms and resolution of the clinical signs¹⁶.

This study shows immediate symptomatic improvement in first week after supratarsal steroid injection and improvement in signs was also noted. Resolution of symptoms and signs was continued for nearly 3 months. Improvement in signs and symptoms was similar in triamcinolone acetonide and dexamethasone sodium phosphate groups as similar results noted by Costa et al. and by another similar study on supratarsal dexamethasone^{17, 18}. Topical steroids show less significant results in symptomatic improvement and also less remission of signs in comparison to supratarsal injections consistent with the results of current study¹⁹. Supratarsal injection is superior to topical steroid due to its anti-inflammatory results and once

inflammation is controlled then topical NSAIDs and topical anti allergic can be used as mainance.²⁰

We found in our study that recurrence occurs after 6 months post injection in comparison to topical steroids where recurrence occurs within 3 months. There were no systemic and local side effects of steroids injection.

Conclusion:

Our study concluded that supratarsal injections of triamcinolone acetonide and dexamethasone phosphate are an efficacious, easy and safe technique in the management of treatment resistant VKC in children . It gives an efficacious and extended comfort in sign and symptoms with prolonged delay and decreased recurrence rate.

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Causes of Blindness in the Schools for the Blind

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Abstract

Purpose: To identify the causes of blindness and to assess the current visual status of students in the schools for blind and to suggest preventive and curative measures.

Study design: It was a cross sectional study.

Place and duration of Study: Study was conducted at Govt. High Schools for Girls Shamsabad Rawalpindi and Govt. Qandeel Secondary School for Blind for Boys Kohati Bazar Rawalpindi in August 2014.

Material and Methods: A total of 254 students of two blind schools were screened for their visual status, by team of ophthalmologist, optometrist and ophthalmic technicians. The visual impairment (VI) was categorized according to the WHO guidelines. Refraction was done and the advice for change of glasses, change of filter and a better suiting low vision aids (LVAS) was given to the students. Students requiring indirect funduscopy, examination under anesthesia (EUGA) or surgical intervention were managed at Benazir Bhutto Hospital Rawalpindi. SPSS version 22 was used for data analysis.

Results: 252 students met the inclusion criteria out of which 138 (54.3%) were females and 116 (45.6 %) were males. Average age was 17 years (age range was (4-25 years) while 93% of them were in the age bracket of 11 years and above. Mild visual impairment was present in less than 1% cases, moderate visual impairment in 35.8% and severe visual impairment was seen in 42.1% while 24.1% were blind out of which 11.1% had no Perception of light. Major causes of blindness and visual impairment in the study population were retinal and optic nerve diseases mounting to 45.0%.

Conclusion: Causes of blindness in our study population are versatile. There are many cases of visual impairment and blindness arising from preventable causes. If interfered timely and properly, load of blindness can be reduced remarkably. *Al-Shifa Journal of Ophthalmology* 2019; 15(2): 65-71. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

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Introduction:

Blindness is defined as visual acuity of less than 3/60, or a corresponding visual field loss to less than 10°, in the better eye with the best possible correction. 'Visual impairment' includes both low vision and blindness¹. A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task for which vision is essential.² Globally, it is estimated that approximately 1.3 billion

people live with some form of vision impairment.^{3,4}

Furthermore, visual disability in children brings more difficulties in their upbringing, education, skill achievement, and self-reliance etc. However, detection and timely management of many of the causes of visual deficiency can improve the visual status, skill achievement and self-reliance.

For that matter this study was designed to screen the students of two blind schools to detect the causes of blindness, level of visual impairment and the suggestions for any interference if indicated. There are many national and international studies upon the causes of visual impairment. Categorization of visual impairment and the suggestions / treatment in different age groups^{5,6,7,8.}

The results give information about avoidable and treatable causes of blindness for the purpose of management by the authorities. Low-vision devices are designed to improve visual performance in patients with low vision, thus enabling academic and social adaptation and providing enrichment of daily experiences.^{1, 2} They can be optical, non-optical or electronic. We followed WHO guidelines regarding visual impairment (VI) and blindness (BL)³

| VA Level | Category |
|----------|-------------------------------|
| <6/12 | Mild visual impairment |
| <6/18 | Moderate visual impairment |
| <6/60 | Severe visual impairment |
| < 3/60 | Blindness |
| No PL | Blindness no light perception |

Among children, the cause of vision impairment varies considerably across countries. For example, in low-income countries congenital cataract is a leading cause, whereas in high income countries it is more likely to be retinopathy of prematurity.³ The students with low vision

can have better quality of life using low vision devices and rehabilitation services.

Materials and Methods:

To achieve the objectives mentioned above, we conducted this cross-sectional study at two blind schools of Rawalpindi. All the students present in the schools were included for screening. Prior permission was taken from the school principals and a consent form was signed/thumb stamped by the students/guardians/teachers. A team consisting of ophthalmologist, optometrist, ophthalmic technician and attendant visited the blind schools.

A proforma was used to take the history from every student especially asking about age of onset of blindness, any optical/surgical/laser treatment, and family history of blindness and consanguinity of parents.

This was followed by detailed ophthalmic examination by the ophthalmologist and the determination of refractive error by the optometrist. Assessment regarding low vision aid (LVAs) was also done by optometrist. Any medical ophthalmic treatment required was advised by the ophthalmologist and referral to the eye department BBH was made for surgical and laser treatments. Help was also taken from school records regarding the underlying cause of blindness as determined by medical certificates of the students.

Cycloplegic refraction, indirect ophthalmoscopy and intra ocular pressure measurement were done in the eye department of Benazir Bhutto hospital Rawalpindi.

The data was recorded according to the following variables:

- Demographic data (name, age, sex, address, etc.)
- Most probable causes of blindness/visual impairment
- BCVA and advice regarding any change in glasses /filters/LVDs

- Medical treatment and name of ailment
- Surgical treatment and name of ailment

Inclusion criteria: students of blind school having best corrected visual acuity in the better eye of $<6/18$.

Exclusion criteria: students of blind school having best corrected visual acuity better than $6/18$ with both eyes.

Duration of study: it was for a period of 4 months, according to the chalked-out schedule (August- November 2014).

Data was entered and analyzed by SPSS version 22.

For the categorization of visual impairment, we followed WHO guidelines.³

Results:

252 students met the inclusion criteria out of which 138 (54.3%) were females and 116 (45.6 %) were males. Average age was

17 years (age range was (4-25 years, 93% of them were in the age bracket of 11 years and above) as shown in table I. The major causes of blindness in our study population are shown in table no. II. Levels of visual impairment among the students is shown in table no. III.

Different low vision aids in use were as follows (Table 4): Optical devices 78 (30.7%), non-optical 81 (31.89%), electronic 63 (24.8%), filters 54 (21.26%) and field expanders were in use of 51 (20.1%) students in our study.

Data of Students receiving a better option of LVAs by our team is shown in table V. There were a high proportion of cousin marriages among the parents of the blind students. There were positive family history present in 176 (69.3%) of our study population.

Table: 1: Age based distribution of 254 students

| Age in Years | Frequency | Percent |
|--------------|------------|--------------|
| Up to 10 | 16 | 7 |
| 11-20 | 162 | 64.00 |
| >20 | 76 | 29 |
| Total | 254 | 100.0 |

Table: II: Major causes of visual impairment and blindness

| Diagnosis | Frequency | Percent % |
|---|------------|--------------|
| Retinal and optic nerve diseases(Retinitis pigmentosa, Rod and Cones dystrophies and Stargardt's disease, hereditary optic atrophy and Nystagmus) | 110 | 45.00 |
| Corneal diseases (ophthalmia neonatorum , sclero-cornea, keratoconus , Cornea plana, trauma, Trachoma, Corneal dystrophies) | 48 | 18.9 |
| Refractive error(high myopia, hypermetropia, astigmatism and anisometropia) | 22 | 7.3 |
| Glaucoma | 18 | 7.1 |
| Cataract | 16 | 6.3 |
| Squint and amblyopia(sensory deprivation) | 14 | 5.4 |
| Undetermined | 26 | 10.2 |
| Total | 254 | 100.0 |

Table: III: Relative frequency of different visual impairments and blindness

| Type of impairment | Frequency | Percent |
|--------------------|-----------|---------|
| Mild | 2 | <1% |
| Moderate | 91 | 35.8 |
| Severe | 107 | 42.1 |
| Blind | 26 | 10.31 |
| No PL Blind | 28 | 11.1 |
| Total | 254 | 100.0 |

Table: IV. Different Low vision Aids in use

| Name of device | Frequency | Percent |
|-----------------|-----------|---------|
| Optical | 78 | 30.7 |
| Non-Optical | 81 | 31.89 |
| Electronic | 63 | 24.80 |
| Filters | 54 | 21.26 |
| Field expanders | 51 | 20.1 |
| Total | 254 | - |

Table: V: Number of students advised a better option

| Name of device | Frequency | Percentage |
|--|-----------|------------|
| Spectacle change for better BCVA | 50 | 19.68 |
| Change Of Filter For Photophobia And Glare | 32 | 12.59 |
| Modification of electronic aid(talking software) | 38 | 14.96 |
| Field expander(reverse telescope) | 9 | 3.54 |
| Non optical aids | 88 | 34.64 |
| No change | 37 | 14.56 |

Discussion:

Many national and international studies have been conducted with almost similar objectives i.e. categorization of visual impairment, identification of preventable causes, assessment for a suitable LVAs and

suggestions regarding prevention /reduction of the childhood blindness.

A national study conducted in schools at Muzaffarabad (AJK, PAK) by Awan AR et al, on 725 students of 5th and 6th class with mean age of 10 years found that major

causes of VI were refractive errors 89.3%, amblyopia 5%, cataract 1.2%, corneal diseases 1.8%, squint 1.8%, and nystagmus 0.6%.⁵ It was a screening type of study in schools for normal children. So, results were slightly different from the studies being conducted in the schools for blind.

Another national study was conducted by Kazmi HS et al at Ayub Medical College Abbottabad (PAK) upon 50 students of a blind school⁶. They assessed the visual status and identified causes leading to visual impairment. Their Results Showed mean age 12.32 years and main causes were malformed globe or traumatic eyes, (16 cases, 32%), Retinitis Pigmentosa (10 cases, 20%), corneal diseases (cumulative 20%), retinal detachment (2 cases 4%) and undetermined (20%).

Internationally studies have been published from different countries e.g. China, India, New Zealand, Mali, Nepal and Saudi Arabia, etc. with same objectives.^{7, 8, 9, 10}

A population based study conducted by Chong CF et al at New Zealand in 2018⁷ showed prevalence rate of childhood blindness and low vision as 0.05% and 0.06% respectively. Principle causes of blindness identified by them were: cortical blindness (31.5%), optic nerve atrophy (16.5%) and optic nerve Hypoplasia, (9.0%). The main preventable causes of blindness were neonatal trauma/asphyxia (31.5%), retinopathy of prematurity (18.2%) and non-accidental injury (10.3%). It depicts the picture of childhood blindness in a developed country where a better level of preventive measures must be in practice.

A study conducted in 2018 in Mali⁸ by N. Guirou et al upon 104 children of blind school showed a blindness of 85.6% and 14.4 % visually impaired according to WHO standards. According to them major etiological categories of blindness were: corneal opacities (26 %), whole globe lesions (19.2 %) and Ametropia (60 %).

A study conducted by Fahad Al-Wadani et al at Al-Noor Institute for the Blind in Al-Hassa, Saudi Arabia in 2012⁹ showed Moderate and Severe visual impairment was present in 82 eyes (67.2%). Hereditary retinal disorders were found in 68 (55.7%) eyes. Although refractive errors were found in 112 (91.8%) eyes, isolated refractive error was found in only 9 students. Congenital glaucoma and cataract were responsible for visual impairment in 16 (13.1%) and 9 (7.4%) eyes respectively. They prescribed optical and non-optical low vision aids where needed.

A study conducted by S Krishnaiah et al at Andhra Pradesh South India in 2009¹⁰ upon 113 children of a blind school declared a blindness of 91% of their study population and the main etiological categories were whole globe 41% ,cornea 8%, lens 10%, uvea 4.5%, retina 19%, optic nerve and glaucoma 6.3% and others 11%.

In our study major causes of visual impairment were Retinal and optic nerve diseases (Retinitis pigmentosa, Rod and Cones dystrophies and Stargardt's disease, optic atrophy, etc.) 45%, Corneal diseases (Ophthalmia Neonatorum, sclerocornea, Keratoconus, Cornea plana, trauma, Trachoma, Corneal dystrophies) 18.9%. Cataract (6.3%) and Glaucoma (7.1%).

About fifty (50) students were advised for change of Spectacles, 38 were for change of filter, 32 were for the modification of electronic aid, 9 were for field expander (Reverse telescope) and 88 were for non-optical aids.^{tab5}

Causes of blindness were mostly similar in different studies with a few differences due to regional & ethnic variation, material & methods used and the level of preventive measures available there.

Conclusion:

There are definite avoidable (genetic diseases, nutritional deficiencies, amblyopia, trauma, etc.) as well as treatable causes (cataract, corneal opacity, glaucoma, refractive errors, squint, amblyopia, etc.) of blindness during childhood. What is needed is an easy access of general public to the health facility centers where early detection and prompt treatment can be instituted which can significantly reduce burden of blindness in early age.

Recommendations:

Rigid screening programs for visual assessment of children are required to detect and manage the visual problems timely. Following are recommended:

1. Easily accessible pediatric screening centers should be established having the capability for the same.
2. All the tertiary care centers should be capable of providing the required medical/surgical/ laser treatment, and the necessary human resource as well as equipment must be available.
3. Trained counselors should be used for the purpose of counseling in the conditions where it is important e.g. hereditary diseases, use of optical devices, follow up visits, etc.
4. Help should be provided to the needy cases by social security, etc.

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Dry Eye Disease and Computers

Munir Amjad Baig¹, Rabeeya Munir², Waleed Munir³, Shakeel Ahmad Faiz¹

Abstract:

Purpose: To report the frequency of dry eye disease (DE) among computer workers.

Study Design: It was a hospital based, cross sectional, prevalent study.

Materials and Methods: Study was conducted at Federal Government Services Hospital Islamabad between December 2015 – December 2016. Three hundred and three Federal govt. computer operators using more than three hours daily and having five years of service attending OPD/ refraction clinics were enrolled and screened for dry eyes (DE) and computer vision syndrome (CVS). Printed questionnaires were distributed to the patients after taking their consent and getting permission from Ethical committee. All subjects were divided into A, B, C groups while detailed eye examination and dry eye tests were performed by a single physician. Data analyzed for frequencies/percentages.

Results: The frequency of CVS was found to be 61.5% among the study participants. Asthenopic symptoms were found in 48% subjects. Neck pain was common in 62%, backache in 61% and leg pain was in 31%. More than half (63%) subjects were not aware of ergonomics and 65% were dissatisfied over their workstation. The overall DE presence in computer users was 13.5%, 38.8% and 48.7% in groups A, B and C while it was 13%, 37.4%, 49.6% in 25-32yrs, 33-40yrs and 41-48 years age group respectively suggesting that the Dry Eye prevalence increases as the years of computer exposure increase.

Conclusion: Prolonged use of computers was associated with dry eye like symptoms in our study. *Al-Shifa Journal of Ophthalmology 2019; 15(2): 72-77. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Computers are a necessity of 21st century. Computer vision syndrome is categorized as symptoms of eye strain, blurred vision, dry eye and neck/ shoulder pain symptoms resulting from prolonged use of computer, tablet, e-reader, mobile phone use and other digital screens.¹

Ergonomics is a Greek word, "ergon," work, and "nomoi," means natural laws. It denotes study of people at work. Ergonomics knowledge helps to reduce and relieve CVS.² In Pakistan insufficient literature was available³ but CVS in Pakistan is on the rise and becomes public health problem reducing work productivity. One study mentioned 80.3% incidence of CVS.⁴

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CVS is often linked with dry eye disease a disease of the ocular surface accompanied by tear film instability.⁵ The Dry Eye is due to decreased blink rate and increased corneal exposure resulting from monitor.⁶ The mean blink rate drops down with the increase of concentration or attention. Mean blink rate is 22 per min in relaxed state, 10 per min when reading a book and 7 per min on the computers.⁷

Evaporative dry eye, around 80%, is due to an insufficient oily layer of tear film and aqueous deficient dry eye due to reduced tear secretions.⁸

It seems that the prevalence of dry eye is increasing in the era of the Internet.⁹ So the eye doctors encounter an increasing number of dry-eye patients in their daily practice. This study examined the prevalence of both CVS and dry eye in a population of office workers.

Materials and Methods:

Three hundred and ninety-three federal govt computer operators using more than three hours daily and having five years of service attending OPD/ refraction clinics were enrolled and screened for Dry Eye and CVS by written questionnaires after taking their consent and permission from Ethical committee. Subjects with any systemic disease, any recent surgery, any ocular pathology, best corrected vision less than 6/9, contact lens users, using any drops and unwilling persons were excluded from the study.

According to the age and duration of computer use per day all subjects were divided into A, B, C groups. Group A=185(47%) who used computers for (2-4 hours) and age group of 25-32 years, Group B 126 (32%) used (4-6hours), age of 33-40 years and Group C 82(20.8%) used (6-8hours) /day and age group of 41-48 years.

A written questionnaire to know the prevalence of CVS and another 6-item dry

eye questionnaire (DEQ-6) to determine the frequency of Dry Eye were administered to all office workers by a trained researcher. Detailed eye examination and dry eye tests were performed by a single surgeon under the same physical conditions. Data analyzed for frequencies/percentages.

The study purpose was clearly explained. Information regarding computer use, ergonomics, proper workstations and presence of symptoms suggestive of CVS both visual and musculoskeletal disorders and level of satisfaction were obtained. Dry eye evaluation was done with Dry Eye questionnaire scoring, tear film break-up time (TBUT)<10sec, Schirmer test(ST)<10mm/5sec., Corneal fluorescein staining (CFS)>1 and slit lamp examination of the lids for mucous threads / telangiectasias. For each patient, all examinations were performed on the same day, in the morning. Diagnosis was made on presence of three of five tests according to the Japanese Dry Eye Society recommendations.

Results:

Three hundred and ninety-three office workers, age 25-48 years, mean age 35.8 ±8.2 years, 270(70%) were male and 123(30%) female comprising 121 data operators, 59 accountants, 71 planners, 62 academicians and 80 teachers. 51.5% (203) subjects were using computers for over 5 years while 48.5% (190) had the experience of more than ten years (Table 1).

Among the study participants, 64.1% (252) had experienced one or more symptoms of CVS. 188(48%) subjects, female 109(58%) and male 79(42%) had asthenopic symptoms. Among extra visual problems neck pain was common in 149(38%), backache in 144(36.6%) and leg pain in 100(25.4%). Sixty three percent subjects were not aware of ergonomics and 65% were dissatisfied over their workstation (Table: II).

The overall Dry Eye frequency in computer users was 13.5%, 38.8% and 48.7% in groups A, B and C while it was 13%, 37.4%, 47.6% respectively in 25-32yrs, 33-40yrs and 41-48 year age group suggesting that the DE experience increases as the years of computer exposure increase (Table: III and IV).

Half of the respondents (200, 50.8%) were symptomatic defined as reporting one or

more dry-eye symptoms often or all the time. The common complaints were burning 39%, eye strain 25%, watering 15% and fatigue (21%). Subjects had low TF BUT were 202(51.3%), 161(41%) patients had fluorescein staining >1, 23.6% had low ST and 141(36%) patients had abnormal meibomian glands appearances.

Table-1 Baseline Characters and Diagnostic Tests

| Characteristics | Frequency | %age |
|------------------------|------------------|-------------|
| Male | 270 | 70 |
| Female | 123 | 30 |
| Urban | 262 | 66.6 |
| Rural | 131 | 33.4 |
| Data Operators | 121 | 30.7 |
| Teachers | 80 | 20.3 |
| Smokers | 100 | 37 |
| Eye Makeup User | 69 | 56 |
| Ergonomic nil | 148 | 64.2 |
| Low TBUT | 202 | 51.3 |
| Low ST | 125 | 38.1 |
| Lid Pathology | 141 | 36 |
| CFS | 161 | 41 |

Table-11 Gender distribution of symptoms

| Ocular complaints | Male | Female | N(%age) |
|--------------------------|-------------|---------------|----------------|
| Asthenopia | 79 | 109 | 188(48%) |
| Neck Pain | 87 | 62 | 149 (38%) |
| Burning | 81 | 72 | 153 (39%) |
| Eye strain | 48 | 50 | 98 (25%) |
| Eye fatigue | 40 | 43 | 83 (21%) |
| Watering | 32 | 27 | 59 (15%) |

Table-111: Dry Eye and duration of computer use per day

| Group | Duration | Sample | Dry eye | Percentage |
|--------------|----------|------------|------------|-------------|
| A | 2-4hrs | 185 | 25 | 13.5% |
| B | 4-6 hrs | 126 | 49 | 38.8% |
| C | 6-8 hrs | 82 | 40 | 48.7% |
| Total | | 393 | 114 | 100% |

Table-IV: Dry Eye and Age wise relation

| Group | Age group | Sample | Dry eye | Percentages |
|--------------|-----------|------------|------------|-------------|
| A | 25-32 | 151 | 20 | 13.2% |
| B | 33-40 | 146 | 55 | 37.6% |
| C | 41-48 | 96 | 46 | 47.6% |
| Total | | 393 | 120 | 100% |

Discussion:

The computer job requires prolonged sitting positions with repetitive activity of eyes and is related to dry eye disease affecting quality of life.¹⁰ CVS prevalence in our study was 64.1%. One study¹¹ and other study by Logaraj et al.¹² reported increasing symptoms of CVS with increased hours of computer use similar to this study. Individuals using computers for three hours daily can develop headache, blurred vision, burning/ irritation, tired eyes, cervical pain, backache and other musculoskeletal disorders¹³ similar to our study which are due to poor ergonomic knowledge and poor workstation designs.

In this study 63% subjects were ignorant about ergonomics.¹⁴ Among them 37% subjects had reduced symptoms who viewed the computer at a distance less than 15 inches and those who worked in the absence of overhead light at their workstation like other study. Parihar JK et al¹⁵ found decreased CVS symptoms among students who viewed the computer screen below eye level than others. Our study, on the contrary, did not show any such result.

According to our results, Dry Eye symptoms appeared in 50.8% subjects similar to other study.¹⁶ The common complaints were burning 39%, eye strain 25%, watering 15% and fatigue (21%) Our study revealed that symptoms of burning and watering were higher among males. The results of questionnaire from 400 computer operators in India revealed 46.3% asthenopic symptoms.¹⁷ In a study of 35 Mexican computer terminal operators 68.5% subjects noticed symptoms.¹⁸ An Australian study of over 1000 computer workers found 63.4% prevalence.¹⁹ The present study showed 48% asthenopic symptoms in groups A&B showing it was not related with the age of the participants but our study noticed higher prevalence in females.

Presence of Dry Eye symptoms like burning was higher in those who used computer for 4 hours or more per day, 48.7% subjects working more than 6 hours experienced severe symptoms similar to other studies.²⁰

Our study also evaluated that 47.6% subjects of C group (41-48 years age) had higher De symptoms compared to A&B

groups showing relation of Dry Eye with longer duration of occupation. Evidence from many other studies supports these findings.²¹

In the present review, 202 (51.3%) subjects had low TFBUT which is an indicator of unstable tear film due to reduced blink rate, 161(41%)patients showed CFS, and 141(36%) patients had abnormal meibomian glands appearances. The alteration of the tear film occurred among computer users similar to ‘The Tear Film and Ocular Surface Society (TFOS) International Dry Eye Workshop (DEWS) II report in 2017, which described dry eye as tear film instability and ocular surface inflammation.²²

Vergence and accommodation responses to electronic screens are similar when viewing printed materials, whereas the DE prevalence is greater during computer usage. The latter is due to a decrease in blink rate and increased corneal exposure resulting from the monitor.²³Our study also confirmed that.

Dry eye disease is more common in older people but growing among the young due to the increasing amount of time spent staring at computer screens. Research has shown that taking frequent breaks while using the computer increases the efficiency and that it relaxes the accommodative system.²⁴

Conclusion:

Working at the computer affects tear film stability due to corneal exposure and reduced blink rate leading to dry eye disease.

Recommendations:

Patient’s knowledge of ergonomics and well-designed workstations can minimize the symptoms of dry eye disease.

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Impact of Diabetes Mellitus on the Variation of Central Corneal Thickness

Muhammad Sajid Munir¹, Muhammad Azhar Abbas², Nusrat Sharif³, Shadab Hassan³

Abstract

Purpose: This clinical study was conducted to validate the existence of a correlation between thickness of the central cornea and diabetes.

Study Design: This was a cross-sectional case study.

Place and Duration of Study: The study was conducted in the Ophthalmology out-patients departments of Central Punjab over a period of one year.

Materials and Methods: A total of 930 patients were examined for measurement of central corneal thickness (CCT) by ultrasound pachymetry and eyes examination was done on the slit lamp. The sample was divided into two groups; 700 eyes of 350 non-diabetics and 1160 eyes of 580 diabetic patients. SPSS version 20.0 was used to analyze the results and t test was used to check the significance.

Results: The average variation of the central corneal thickness in the diabetic patients was 576.43 ± 16.52 microns with a range between 514–626 microns. In non-diabetic patients the average central corneal thickness was 516.86 ± 22.74 microns with a range between 448–649 microns. Statistically significant increase in the thickness of central cornea was noticed in diabetic patients relative to non-diabetic patients ($p < 0.001$)

Conclusion: Diabetic patients were found to have thicker central cornea as compared to the non-diabetic patients. While obtaining accurate IOP measurements in diabetic susceptible the association of diabetes mellitus with thickness of the central cornea should be considered. *Al-Shifa Journal of Ophthalmology 2019; 15(2): 78-81. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Diabetes mellitus is a disease effecting millions of people worldwide. It is a multisystem disease having huge socioeconomic effect not only because of its increased frequency but also due to the chronic nature of the disease and increased fatality rate. The International Diabetes Federation (IDF) estimated the global prevalence of diabetes to be 246 million in 2007 and possibly reaching up to 380 million by 2025. This translates into approximately 5.9% of the world adult population, with 80% of cases occurring in the developing world. In Pakistan, 15.45% of the diabetic patient's age ranges between 30 to 70 years. Early diagnosis of diabetes allows prescribing an adequate treatment and avoiding potential complications, which is a key element in the development of this disease¹.

Diabetes mellitus can affect almost any structure of the eye. The most frequent cause of blindness in diabetic patients is diabetic retinopathy and age-related macular degeneration². Patients can develop not only diabetic retinopathy but also corneal damage to the epithelial and endothelium. punctate epithelial keratitis, recurrent corneal erosions , persistent epithelial defects and corneal hypohesia.^{3,4,5} Paucity in pumping function, cell morphology alteration, folds and possible thickening in endothelium may be caused by the endothelial alteration^{3,4,5}.

The main theme in the background of this research was to evaluate if there is any difference in thickness of central cornea of diabetic patients and non-diabetics in Pakistan.

Materials and Methods:

This cross-sectional study was conducted in ophthalmology clinics in the remote areas of Central Punjab province over a period of one year. The sample size was nine hundred and thirty patients including both healthy individuals and diabetic patients between the ages of 18 to 79 years. Diabetics (n=580) participating in this study were divided into three groups in accordance to the duration of diabetes.

Complete ocular examination for both eyes was performed including visual acuity, refractive error and slit lamp examination. Patient with the history of glaucoma, corneal degenerations like keratoconus, corneal surgery, any intraocular surgery, ocular trauma were excluded. Patients who wore soft or hard contact lenses were also excluded. All measurements of CCT were taken by an ophthalmologist. The measurements were recorded by using a contact ultrasonic pachymeter probe (Scan/Pachymeter SP- 1000AP China) in undilated eyes by placing it gently in the mid pupillary axis of the cornea. Data was analyzed using SPSS version 20 software. Means, standard deviation and ranges were

calculated for CCT and other variables and types and duration of diabetes was evaluated using independent t test. For this study approval was obtained from institutional ethical and research committee. All measurements and steps were taken after the patients consent.

Results:

The average age of sample individuals was 45.5 ± 3.0 years ranging from 18 to 79. From these 980 patients, 593 patients were male (58.2%) and 337 patients were females which were (41.8%) of the total patients. The average central pachymetry of diabetic patients were 576.43 microns ± 16.52 , ranging between 514 to 626 microns as compared to 516.86 ± 22.74 microns (ranges 448 to 649 microns) for non-diabetic patients among the total patients, the statistically typical difference was ($p < 0.001$ student test).

Discussion:

This study demonstrates relationship between diabetes and CCT, independent of the age, IOP and other factors. On the average people with diabetes had thicker central corneas and people with no diabetes had relatively normal or thinner cornea. Association between diabetes and CCT is potentially important as diabetes is a common condition, in most countries with an estimated 20.8 million (7.0% of the population) (^{7,8}). CCT effects on measurements of the intraocular pressure (IOP) are well documented in literature. Accurate IOP measurement is one of the most important steps in the ophthalmic practice especially when it comes down to the diagnosis and assessment of the efficacy of glaucoma treatments. Because in glaucoma the only manageable thing is IOP. Falsely high IOP readings are just due to increment in CCT and falsely low IOP readings are mainly due to the thin corneas⁹.

The biological basis for corneal change in the diabetic patient's eye has not yet been established and the mechanism behind this

is still not reported. ¹⁰. *Anna M. et al*, central corneal thickness measurement from diabetics having background diabetic retinopathy seen on fundoscopy recorded greater value of thickness in the central cornea of patients in comparison with the controlled group ¹¹. The correlation of CCT and diabetes duration was also noticed. They noticed that younger diabetic patients have thinner corneas while the older diabetics had thicker corneas due to dysfunctional pump of the corneal endothelium and excessive hydration in cornea. *Richard O. et al*, noticed the association of thicker central cornea with hyperglycemia, in their research glucose level become the basis to group the patients, so patient grouped according to the level of glucose and the thing which is not considered was the stage of diabetic retinopathy ¹². Several mechanisms were used to elaborate these associations as corneal endothelium dysfunction, corneal swelling and stromal hydration, this is the reason that hyperglycemic patients in the clinics complain about blurring and fluctuation of vision.

Daniel et al, noticed that the thickening in the central cornea of 81 patients with proliferative diabetic retinopathy, when comparison made between the non-proliferative diabetic retinopathy and control group ¹³. Greater central corneal digits may be due to excess water addition in cornea, dysfunctional corneal endothelium and they explained that the boosted size increment in cornea which was noticed in the beginning stage of the disease¹⁴.

Conclusion:

It is seen that cornea in diabetics is thicker than the normal population. This shows very important complaints of the diabetic patients presenting in the OPD (outpatients department) with blurring of vision due to the changed status of the cornea.

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Role of Optometrist in Management of Retinitis Pigmentosa

Mehwish Ali¹, Saima Suman¹, Ruhallah², Imran Ahmad³

Abstract:

Objectives: The aim of the study was to identify role of optometrist in early detection of symptoms, signs and management of Retinitis Pigmentosa and to formulate recommendations for the awareness about hazards of retinitis pigmentosa.

Study Design: This was a descriptive cross-sectional study.

Materials and Method: This study was conducted during September to November 2018 involving the use of self-designed proforma. A sample size of total 31 retinitis pigmentosa patients was enrolled in this study. Patients' profile and clinical data were collected followed by low vision assessment and prescription of optical and non-optical devices and counselling of the patient. Results of this study were analyzed using SPSS version 20 and Microsoft Excel 2010.

Results: The study included a total of 31 retinitis pigmentosa patients. Out of 31 patients, 35.5% had severe visual impairment (low vision) category, 51.4% had moderate visual impairment (low vision) category while 12.9% patients were clinically blind. Near vision add was appreciated by majority of patients.

Conclusion: This study concluded that an optometrist can assist in the management of RP by performing low vision assessment and prescribing patients with low vision devices like hand and stand magnifiers, optical and non-optical devices and thus help to improve patient's quality of life. *Al-Shifa Journal of Ophthalmology 2019; 15(2): 82-86. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Retinitis pigmentosa is a group of chronic hereditary eye disorders characterized by progressive loss of photoreceptors (rods and cones) of retina which gradually leads to degeneration and atrophy of retina. Nyctalopia (night blindness) is the hall mark of retinitis pigmentosa (RP).¹

Retinitis pigmentosa is the major cause of hereditary blindness, since approximately 1: 4,000 people suffer the non-syndromic form of this illness over the course of their lives.² It is estimated that there are currently 1.5 million people around the world affected with this disease.³ Hereditary degenerations of the human retina are genetically heterogeneous, with well over 100 genes implicated so far.⁴ Measurements of retinal function, such as electroretinogram, show that the function of

photoreceptors generally decreases many years before the symptoms of night blindness, scotoma of the visual field, or decreased visual acuity appear.⁵ More than 45 genes have been identified for retinitis pigmentosa. These genes represent only about 60% of all patients; the rest have defects in a gene not yet identified.⁶

The early-onset of RP occurs in the earliest years of life, linked with forms of syndromic disease, while the late onset of RP occurs from early adulthood to the middle age.⁷ Patients with retinitis pigmentosa, usually lose night vision in adolescence, peripheral vision in early adulthood and central vision in later life due to the progressive loss of photoreceptor cells (rods and cones).⁸ Initially retinal degenerative symptoms of retinitis pigmentosa are; (1) nyctalopia (loss of night vision) (2) loss of peripheral vision (tunnel vision).⁹ The photoreceptor cells of the rod are responsible for dim light vision and are located at the periphery of the retina.¹⁰ Photoreceptor cells of the cone are responsible for visual acuity, color vision and vision in the central visual field.¹¹ Color vision and visual acuity can also be affected in RP due to the associated anomalies in the photoreceptor cells of the cone.^{11,12} Fortunately, most cases of RP take a long time to develop and the loss of vision is gradual. It can be many years until the loss of vision gets worse.¹³

Optometrist can play a vital role in early detection of signs and symptoms of undiagnosed retinitis pigmentosa patients through careful work up. By taking family history of patients suffering from RP, they can help to detect the disease pattern.¹⁴ There are numerous genes that mutate and cause RP. Inheritance patterns of RP have been recognized as X-linked, autosomal dominant, and autosomal recessive.¹⁵

Retinitis pigmentosa diagnosis is based on the documentation of the photoreceptor progressive loss, monitored by a

combination of visual field and visual acuity tests and colour and contrast sensitivity tests.¹⁶ In addition to corroborate other pathological features of this disease, electroretinography may also be necessary.¹⁷

Since majority of RP cases are not advised any surgical treatment, it is important to provide them best possible optical correction to improve their quality of life. The purpose of this study was to evaluate the role of optometrist in management of retinitis pigmentosa.

Materials and Methods:

This was a descriptive cross-sectional study involving the use of self-designed proforma. A sample size of total 31 retinitis pigmentosa patients was enrolled in this study. Ethical clearance to conduct this study was obtained from the College of Optometry and Allied Vision Sciences, King Edward Medical University, Lahore. The biodata and demographic details were noted. Study including patients with retinitis pigmentosa diagnosed after detailed fundus assessment. Mentally retarded and uncooperative patients and patients with other retinal diseases were excluded. Informed consent was obtained from the subjects. Optometric workup included a detailed history followed by evaluation of uncorrected and best corrected visual acuity. After this, patients were evaluated for various filters and low vision devices to further improve their visual functions. Information was gathered by self-made proforma in the form of hard copy. Data was entered on SPSS version 20 and Microsoft Excel 2010. The informed consent of every patient was taken before collecting the data.

Results:

This study included a total of 31 retinitis pigmentosa patients. Out of these 31 patients, 35.5% patients had severe visual impairment, 51.4% had moderate visual impairment while 12.9% patients were

clinically blind. Visual impairment level of patients is shown in table I. The near vision add prescribed to the patients is shown in table II.

About 80.6% patients were advised glasses for near and distance. For further

improvement in vision, 48.4% patients were given telescope and magnifiers with spectacles. For managing glare problem and improving color and contrast sensitivity, 87.1% subjects were given filters with spectacles.

Table I: Visual Impairment level among the patients

| Visual Acuity with Refraction | Frequencies (percentage) | |
|-----------------------------------|--------------------------|-----------------|
| | Right Eye | Left Eye |
| Log MAR score | | |
| Clinical blind | | |
| PL+ | 4 (12.9) | 5 (16.1) |
| Severe visual impairment | | |
| 2.0to 1.5 | 7 (22.6) | 5 (16.1) |
| 1.4 to 1.0 | 4 (12.9) | 6 (19.4) |
| Moderate visual impairment | | |
| 0.9 to 0.5 | 10 (32.3) | 9 (29.0) |
| 0.4 to 0.0 | 6 (19.4) | 6 (19.4) |
| Total | 31 (100) | 31 (100) |

Table II: Add for near vision

| Visual acuity with Near Add | Frequencies (percentage) | |
|-----------------------------|--------------------------|-----------------|
| | OD | OS |
| Log Mar | | |
| 5.0 to 2.5 | 6 (19.4) | 7 (22.6) |
| 2.0 to 1.0 | 9 (29.0) | 8 (25.8) |
| 0.75 to 0.50 | 11 (35.5) | 11 (35.5) |
| Not given | 5 (16.1) | 5 (16.1) |
| Total | 31 (100) | 31 (100) |

Discussion:

The basic purpose of this study was to evaluate the role of optometrist in early detection of retinitis pigmentosa and its management. Retinitis pigmentosa is a group of chronic hereditary eye disorders characterized by progressive loss of photoreceptors (rods and cones) which gradually leads to degeneration of the retina causing visual impairment or even blindness in the patients.

In this study 31 RP patients were examined. From the results of this study, we conclude that RP patients could be benefitted a lot with proper optometric assessment and visual rehabilitation could be achieved through low vision aids. Studies suggest that the quality of life of RP patients could be improved with the help of optical and non-optical devices, environmental

modifications and orientation and mobility training^{17,18}.

As mentioned above that Retinitis pigmentosa is mostly a hereditary disease so the patients enrolled in this study had strong family history of RP which shows that this disease comes down to affect the next generations. This disease is mostly transmitted due to inter family marriages which should strongly be discouraged in next generation^{15,16}.

Similar studies were also conducted at other hospitals¹⁸. Hyashi H et al. described that due to retinitis pigmentosa, visibility was reduced to 6/12 or more on the visual acuity chart and color vision was also reduced due to the destruction of the cones. They recommended that patients with retinitis pigmentosa should be helped by good refraction so that the patient could benefit and stay fit for society and social life. They also reported that half of the patients needed spectacles for better vision. They prescribed minus lenses to the patient to have better night vision and advised low vision devices for reading tasks.

An optometrist can also provide specific information about nutritional supplements that can help delay the disease.¹⁸ In addition, low vision aids, including telescopic and magnifying lenses, night vision aids and other adaptive devices, can help people with RP make the most of their remaining vision. An optometrist with experience in low vision rehabilitation can provide training in the use of these devices.^{19,20}

Conclusion:

This study concluded that an optometrist can assist the patients suffering from RP by performing low vision assessment and prescribing them with low vision devices like hand and stand magnifiers, optical and non-optical devices. Patient's quality of life can also be improved through counseling,

environmental modifications, orientations and mobility training.

Recommendations:

Effective strategies should be devised to educate and train RP patients. Certification of medical staff for managing low vision patients could be helpful.

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Efficacy of Enucleation Technique Using Westcott Scissors for Retinoblastoma – Sahaf’s Technique

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Abstract

Objective: To report the mean length of optic nerve stump transected after enucleation using Westcott scissors by Sahaf’s technique.

Materials Methods: This was a Quasi experimental study conducted at Department of Ophthalmology, Mayo Hospital, King Edwards Medical University Lahore, from Jan 2013 to June 2016. Included were the patients who had unilateral or bilateral retinoblastoma with large tumor, non-salvageable vision and increased risk of metastasis. Informed consent was obtained from all parents after explaining about the research project. Patients were admitted in ward and all of them underwent surgery by a single surgical team. The surgical procedure was performed in supine position under general anesthesia in all patients. Optic nerve stump was measured with plastic rule after enucleation is completed in all patients.

Results: A total of 30 eyes of 30 patients suffering from advanced retinoblastoma underwent enucleation with orbital implant using Westcott Scissors. Out of total 60% were male while 30% were females. In 53.3% patients, right eye was enucleated while in 46.7% of the patients left eye was operated. The age of the patients ranged from 11 months to 28 months with the mean of 19.43 ± 4.61 . Thirty percent of the patients were suffering from bilateral retinoblastoma; however, enucleation was performed in one eye with advanced staged retinoblastoma. The length of optic nerve resected during the procedure ranged from 13 mm to 18 mm with a mean of 15.86 ± 1.67 mm. The maximum length of optic nerve obtained with this technique was 18 mm.

Conclusion: Enucleation with Westcott scissors is a safe and effective technique for getting longer optic nerve stump in retinoblastoma patients. *Al-Shifa Journal of Ophthalmology 2019; 15(2): 87-92.* © *Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Retinoblastoma is the most common primary intraocular malignancy of childhood affecting 01 in 16,000 live births.^{1,2} Presentation of retinoblastoma is anytime from birth to 5 years of age and two-third cases of retinoblastoma are unilateral while one-third are bilateral.^{3,4} Most common presentation of retinoblastoma is white pupillary reflex (Leucokoria) followed by strabismus. However, patients may also present with secondary glaucoma (Buphthalmos), uveitis, hyphaema, proptosis and even fungating mass.^{5,6} Children may also present with clinical manifestations of

metastatic disease such as bone pains, vomiting, headache and scalp masses.^{7,8}

Retinoblastoma can follow in three different growth patterns; Endophytic growth, where the tumor cells can seed into the vitreous cavity, exophytic, which is characterized by subretinal space extension along with exudative retinal detachment and diffuse spread and infiltration of retina. Metastasis to CNS and other viscera via optic nerve and blood.⁹ The most important objective in management of retinoblastoma is the survival of patient's life which can be achieved if tumor is restricted within the globe and metastasis prevented. Secondary and tertiary goals are the preservation of globe and vision.¹⁰

Management of retinoblastoma encompasses range of treatment modalities starting from a localized laser photocoagulation, cryotherapy, brachytherapy to systemic chemotherapy and then more radical procedure such as enucleation. The technique used for enucleation is aimed at removing the globe with minimum manipulation and to remove a long section of optic nerve along with globe.¹¹ Maximum optic nerve length should be obtained to avoid any recurrence after enucleation. The presence of tumor cells at surgical margin of optic nerve after enucleation has been related with poor prognosis for life.¹²

Several methods and instruments have been utilized to dissect and retrieve a longer section of optic nerve during enucleation. The use of Westcott scissors, which is relatively a smaller instrument than the conventional enucleation scissors, has not been reported before in literature. We, in our study used a different technique of enucleation using Westcott's scissors to cut optic nerve. The rationale of conducting this study was to observe the length of optic nerve removed with this new technique. This may help in obtaining a longer optic nerve at the time of enucleation, which will

improve chances of patient survival and change our knowledge and practice.

Materials and Methods:

This was a Quasi experimental study conducted at Department of Ophthalmology, Mayo Hospital, King Edwards Medical University, Lahore from January 2013 to June 2016. Patients with age ranging from 10 - 28 months and diagnosed as having unilateral or bilateral large size retinoblastoma with no potential for useful vision were included. Patients were registered by nonprobability purposive sampling. All those patients who had small or medium sized tumor and metastatic tumors were excluded from the study. Open EPI calculator was used to calculate the sample size which appeared to be 30 eyes. After taking permission from hospital ethical committee, 30 patients were registered in the study. Informed written consent was taken from all the parents/guardians after explaining the procedure and importance of carrying out enucleation. Demographic details were documented, detailed ocular and systemic examination was carried out. Indirect ophthalmoscopy of both the eyes was done after mydriasis with cyclopentolate eye drops (Cyclopen 1%). Preoperative general anesthesia fitness was given by consultant anesthesiologist. All the patients underwent surgery by a single surgical team and optic nerve stump was measured after the surgery with plastic rule and documented.

Patients were admitted to indoor facility, one day before the day of surgery. The surgical procedure was performed in supine position under general anesthesia by single surgical team. After meticulous draping, Lateral canthotomy was performed to decrease the resistance imposed by lids to forward displacement of globe. A 360° conjunctival peritomy was performed with blunt tipped Westcott scissors. All the extraocular muscles were identified secured with 6/0 vicryl suture and disinserted from the globe. Eyeball was lifted anteriorly with

minimum manipulation and fats along with other orbital structures around the optic nerve were bluntly separated with a cotton swab. Optic nerve was approached medially and felt with blunt tipped mildly curved Westcott scissor pushing deep up to the orbital apex. After encountering the bony resistance to further movement, optic nerve was gently transected while the globe was lifted at the same time from medial rectus stump to make the optic nerve taut. The orbit was packed with adrenaline-soaked ribbon gauze to achieve hemostasis. The surgery was completed with placement of orbital implant within the muscle cone, followed by closure of tenon and conjunctiva. After completion of surgery, the enucleated globe with optic nerve stump was put on a plastic rule and length of optic nerve stump was measured and documented.

Statistical package for social sciences (SPSS) 22.0 was used for statistical analysis of the data. Quantitative variables like age and optic nerve stump were analyzed and presented in the form of mean \pm S.D.

Qualitative variables such as gender and laterality were measured in terms of frequency and percentage.

Results:

A total of 30 eyes of 30 patients suffering from advanced retinoblastoma underwent enucleation with orbital implant using Westcott Scissors (Fig. 1). Out of total 60% were male while 30% were females. In 53.3% patients, right eye was enucleated while in 46.7% of the patients left eye was operated (Table. I). The age of the patients ranged from 11 months to 28 months with the mean of 19.43 ± 4.61 (Table II). Thirty % of the patients were suffering from bilateral retinoblastoma, however enucleation was performed in one eye with advanced staged retinoblastoma. The length of optic nerve resected during the procedure ranged from 13 mm to 18 mm with a mean of 15.86 ± 1.67 mm as shown in Table II. The maximum length of optic nerve obtained with this technique was 18mm as shown in the figure 2.

Table: I Shows frequency distribution of age and laterality among the patients

| Variables | | Number of patients (n= 30) | Percentage |
|------------|-----------|-------------------------------|------------|
| Gender | Males | 18 | 60 % |
| | Females | 12 | 40 % |
| Laterality | Right Eye | 16 | 53.3 % |
| | Left Eye | 14 | 46.7% |

Table: II. Shows mean age and optic nerve length of patients

| Variables | Minimum | Maximum | Mean \pm Standard deviation |
|-----------------------|-----------|-----------|-------------------------------|
| Age | 11 months | 28 months | 19.43 ± 4.61 |
| Length of optic nerve | 13 mm | 19 mm | 15.86 ± 1.67 |



Fig. 1 Shows Westcott scissors used during Sahaf's Enucleation technique for Retinoblastoma



Fig: 2 Shows maximum optic nerve length resected with this technique that was 18mm.

Discussion:

Management of retinoblastoma is aimed at three main objectives; First and the foremost is saving the life of the child, second is cosmetically acceptable eyeball and third is to salvage vision. Despite the recent advances in diagnostic and therapeutic modalities, which have substantially reduced the need for surgical removal of eyeball, enucleation is still the treatment of choice for saving life in developing countries especially when the tumor is advanced.^{15,16} Although basic principles of enucleation surgery remain the same, the technique varies among different surgeon worldwide. Resecting a long optic nerve stump along with minimum manipulation of globe is one of the main objectives of this procedure, when

performed for intraocular malignancy such as retinoblastoma.¹⁶

Various surgeons have tried different instruments and techniques to achieve longer optic nerve stump. David and coworkers reported in their study that longer optic nerve segment can be obtained by using mildly curved scissors with temporal approach instead of a strongly curved scissors. They also claimed that a strongly curved scissors will resect shorter optic nerve segment regardless of approach.¹⁷

Kostadin G and Janev proposed the use of "improvised net" in their study which helped to eradicate the complications that appear during standard enucleation procedure.¹⁸In another study it was

concluded that enucleation snare provides longer optic nerve section instead of routine enucleation scissors. Because snare can be pushed deep into the optic nerve. But this enucleation procedure gave diffuse severe crush artifact.¹⁹

Sakolsatayadorn N and colleagues introduced another technique which involved the delivery of bupivacaine and lidocaine solution containing epinephrine into sub-tenon space. They suggested that longer optic nerve is obtained by injecting anesthetic and vasoconstrictive agent in subtenon space, as they cause forward displacement of globe and help reaching deep in the orbit toward orbital apex.²⁰

In present study, we introduce new instrument and a new technique by which maximum optic nerve length than any other procedure can be obtained easily. Firstly, we modified the routine procedure by lateral canthotomy, that reduces the hindrance of lids to the forward movement of globe. Secondly, we used Westcott scissors that previously was used only for 360 degrees conjunctival peritomy during enucleation but now we use it for the transection of optic nerve as well. Westcott scissors are smaller scissors that help in cutting optic nerve more posteriorly than larger enucleation scissors. This new technique is known as Sahaf method.

Conventional technique gives maximum optic nerve stump of 8.5 mm, while Sahaf method gives maximum optic nerve stump of 18mm and a mean of 15.86 ± 1.67 mm. Therefore, it is believed that this method will help in proper excision of optic nerve as far as possible especially in cases where metastasis through optic nerve is suspected.

In view of these findings, we conclude that the Westcott scissors should be considered a valuable instrument in retinoblastoma patients in whom obtaining a long optic nerve is of vital importance. It provides

safer, more efficient and more predictable method to increase optic nerve length compared with previous techniques.

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