We are living in a scientific world, where Ophthalmology has progressed and proliferated tremendously for the last 50 years. Though it has seen many significant changes during this period yet unfortunately, despite many strides, we are still holding the same old paradigm ‘cupping of the disc’ in glaucoma. With the passage of time it has become necessary to remove any ambiguity arising in any field of Ophthalmology and to make it a pragmatic branch of Medicine, very much useful to the society. Ophthalmology is a universal subject with equal importance for every human being. The light which illuminates the eye is a part of the light which Almighty Allah has given to this universe and all those who try to protect, preserve and promote this light are really entitled of His Benevolence.

When scientific minds prune various viewpoints judiciously from different angles, it always helps in solving many intricate problems and hypothesis in order to get useful results. At this juncture, consultation with colleagues from time to time is always fruitful and a step in the right direction. It has been observed that many hypothesis never remain the same for a longer period and these are always undergoing constant changes, based on careful scientific research, observation and experimentation. According to the current norms if we control the IOP by medication or surgery, the pathological process of glaucoma still continues, this carries an intriguing ambiguity regarding the pathogenesis of glaucoma which needs further research.

In this context, a Pakistani scientist has appeared on the ophthalmic horizon and has challenged the old paradigm of ‘Cupped disc’ in glaucoma by a new hypothesis, the ‘Optic disc may be sinking’. In fact he rebuts the 150 year old theory of cupped disc with solid arguments. The brainy ophthalmologists is Dr. Syed Sikandar Hasnain, a graduate of Nashtar Medical College, Multan and a student of our venerated teacher Prof. M. Shaffi, who is practicing Ophthalmology for the last 40 years in California (USA). Undoubtedly, such scholars and intellectuals are the real assets of any nation; even the moderate scholars are not less than a blessing and ultimate need of the time. If we consider Dr. Hasnain a moderate scholar as he, out of his extreme humility avoids being labelled as a scholar, thinks it to be an uphill task to change or challenge a well established paradigm conformed more than a century ago.

Based on evidence, observation and clinical judgment, it is not only Dr. Hasnain, who has challenged the old paradigm but there are many reputed glaucoma specialists who have tried to give new directions to the pathogenesis of glaucoma. Dr. Hasnain indicates that why are the arcuate axons selectively destroyed first in the initial stages of Glaucoma? He strongly thinks that this is the only core issue in resolving the pathogenesis of glaucoma. Dr. Weinreb an exponent of glaucoma research and other known scientists like Dr. Neeru Gupta and Dr. Vanderbilt consider glaucoma a neuro-degenerative disorder. They are excited to find loss of neurons in Lateral Geniculate Nucleus (LGN) and in occipital cortex. Dr. Calkins, a senior scientist of Glaucoma Foundation went further in suggesting that glaucoma starts from the mid-brain and travels towards the retina. Dr. Hasnain refutes this theory through arguments that if the Multiple Sclerosis is a neuro-degenerative disease why there is no selective destruction of...
arcuate axons and no excavation of the disc in Optic Atrophy? He considers that the loss of neurons in LGN and loss of ganglion cells in the retina simultaneously supports his hypothesis of ‘sinking disc’ resulting in the axons being axotomized and not atrophied as in glaucoma. This axotomy results in retrograde degeneration of neurons in LGN. Prof. Paul Sternberg has given credence to neuro-biological approach, focussing on the study of neuronal activity in the mid-brain. He claims that axon in the optic nerve eventually loose their ability to communicate with the mid-brain. Hence the researchers are finding drugs to improve or restore the connectivity between optic nerve and mid-brain. Prof. Ramanjit Sihota, Chief of Glaucoma Research facility in India has supported the changing paradigm of Dr. Hasnain. (for detailed study, readers may find two articles in this issue and another one in the last July issue of Ophthalmology Update).

To sum up, it appears that we are entering a new world of glaucoma by evaluating the disc based sinking, where diagnosis will be easy and substantial.

Dr. Hasnain’s first hypothesis ‘scleral edge, not optic disc or retina is the primary site of injury’ was given due recognition after being published in an indexed journal “Medical Hypothesis” in 2006 and was also highlighted in a text book: Glaucoma-Medical Diagnosis & Therapy under caption: New Horizon. The book was edited by a renowned scientist, Leonard A. Levin. His hypothesis received tremendous appreciation with a positive feed back in the conference Envision-08 held in San Antonio, Texas.

He considers that we are working under wrong paradigm of ‘Cupping of Disc’ mistakenly given to us 150 years ago. His arguments appear to be very valid when he puts forward this question as a challenge to the glaucoma experts “why RNFL thins out in glaucomatous eyes”? Ophthalmologists fail to answer this question. He has also asked few other puzzling questions to the scientists involved in glaucoma research, if they can find answer to them, fair enough, otherwise they should accept his arguments. His question are:

i) Why some ocular hypertensive subjects with IOP above 30 mmHg never develop glaucoma whereas subjects with normal tension 10-22 mmHg are reckoned as glaucomatous?

ii) Why are the arcuate axons and peripheral axons get atrophied in early stages of glaucoma, whereas macular axons last till the end stage of glaucoma?

iii) Why can’t glaucoma be halted despite maximally lowering IOP?

He considers that axotomy of axons result in excavation of disc, a feature of chronic glaucoma. His hypothesis appear to be very convincing till the exponents of ‘cupped disc’ accepts the challenge and refute the new hypothesis on solid grounds. It is very strange that the World Glaucoma Congress in Boston has turned down his changing paradigm without explaining any scientific argument which appears very unethical. In the world of emerging scientific advancement, we must ascertain new theories, hypothesis or any change of a paradigm on scientific lines which is the mainstay of our searching methodology in the New World Order.

According to latest statistics of National Eye Institute there will be 80 million glaucomatous people by the year 2020 as such the risk of visual loss will rise to seven fold after the age of 55. Though it is difficult to change the old established paradigm, yet we think that our young scientists must raise their eye brows over this ambiguity and we also expect our senior faculty members not to turn a blind eye to this simple and equally important question and help our younger generation to take up this challenge to convert the old paradigm in the light of new concepts based on modern thinking ‘Sinking Disc Hypothesis’.

No Doubt, Dr. Hasnain has made a relentless effort to establish a new paradigm to see the light of the day very soon.

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**Colobomatous Optic Disc**

Gemmy Cheung, MD
Singapore National Eye Centre, Singapore

A 38-year-old man was referred with blurry vision and no past ocular history of any significance. On examination, uncorrected visual acuity was 6/6 in both eyes. Anterior segment examination was unremarkable. IOP was 18 mmHg in the right eye and 20 mmHg in the left. Funduscopy showed a tilted disc in the right eye. Examination of the left eye showed a white excavation of the optic disc with thinning of the inferior rim. Macular appearance was normal with no fluid accumulation.

He was diagnosed to have Optic disc coloboma which is the result of incomplete closure of the proximal end of the embryonic fissure. This condition may be isolated or associated with systemic disorders. This patient’s other abnormalities suggest that he most likely suffers from CHARGE syndrome, a rare genetic disorder involving coloboma of the eye, cardiac defects, atresia of the choanae, retardation of growth and/or development, with genito-urinary and ear abnormalities.

(Courtesy: Michael P. Kelly, CPT. Online)
INTRODUCTION

Glaucoma is characterized by progressive loss of retinal ganglion cells leading to characteristic visual fields defects and optic nerve head cupping and pallor\(^1\). It is an optic neuropathy secondary to various risk factors including increased IOP.

Glaucoma may be (a) congenital or (b) acquired. Further sub-classification into open-angle and angle-closure type is based on the mechanism by which aqueous outflow is impaired. The glaucoma may also be (a) primary or (b) secondary depending on the presence or absence of associated risk factors. In primary glaucoma there is no associated ocular disorder while in secondary glaucoma a recognizable ocular or non-ocular disorder alters aqueous outflow. Secondary glaucoma may be acquired or developmental and of the open-angle or angle-closure type.

Secondary open-angle glaucoma may be:

1. Pre trabecular like neovascular glaucoma.
2. Trabecular like pigmentary glaucomas, red cell glaucomas, ghost cell glaucomas, phacolytic glaucomas, pseudoexfoliative glaucomas and post-traumatic angle recessive glaucoma etc.
3. Post trabecular in which aqueous outflow is impaired by elevated episcleral venous pressure due to carotid-cavernous fistula, Sturge-Weber Syndrome and obstruction of superior vena cava.

Secondary angle-closure glaucoma may be: due to posterior forces which push the peripheral iris against the trabeculum (iris bombe due to seclusio- pupillae) or anterior forces which pull the iris over the trabeculum by contraction of inflammatory or fibrovascular membrane (e.g. late neovascular glaucoma).

Patients present with a variety of signs and symptoms like pain, watering, dimness of vision, headache, nausea and vomiting depending on the nature of glaucoma. Therefore, slit-lamp biomicroscopy, fundoscopy, tonometry, gonioscopy and perimetry is mandatory for management of these patients to see for ciliary injection and corneal oedema, optic disc cupping, raised intraocular pressure, angle details and visual field defects.

Glaucoma is a highly prevalent and vision threatening condition affecting approximately 66 million people worldwide\(^2\). In a recent study conducted in Pakistan, it was shown that glaucoma accounted for 8.1% of all eye admissions. Open-angle glaucoma was responsible for 37.6% glaucoma admissions followed by secondary glaucoma.
(35.0%) and angle-closure glaucoma (18.2%)4.

In our set-up, people present with advance disease due to poverty, illiteracy and lack of proper district-based eye care. Different types of treatment options are available like anti-glaucoma drugs, laser treatment and surgical interventions. Treatment of choice in our setting is surgical intervention due to poverty, poor drug compliance, late presentation and high failure rate of laser trabeculoplasty 4.

Trabeculectomy alone introduced by Cairns in 1968 and modified by Peter Watson in 1970 5,6, or with antimetabolite (Mitomycin-C, 5-Fluoro-urocil) has been the surgical method of choice7. So the purpose of this study was to compare the success rate of trabeculectomy with and without Mitomycin C in lowering intraocular pressure without the use of anti glaucoma medications.

Inclusion criteria:
- Primary Open Angle Glaucoma
- Primary Angle Closure Glaucoma
- Pseudo-exfoliative Glaucoma
- Pigmentary Glaucoma
- Steroid Induced Glaucoma

Exclusion criteria:
- Complicated Glaucomas
- Congenital Glaucomas
- Neovascular Glaucoma
- Ocular Hypertension
- Previous trabeculectomy
- Patients under 17 years

MATERIAL AND METHODS:

This prospective study of 100 eyes of 80 patients of glaucoma was conducted from January 2005 to December 2007 at the Department of Ophthalmology, Lady Reading Hospital, Peshawar. Patients were randomly divided into two equal groups. In group I, 50 eyes (50%) underwent trabeculectomy with intraoperative Mitomycin C (MMC) while in group II, 50 (50%) eyes underwent trabeculectomy without MMC. Patients were admitted in the eye ward for full assessment. Past and present history of any topical or systemic drug was recorded.

Inquiry was made into the presence of any systemic disease. Complete ocular examination was done including visual acuity, slit lamp examination, intraocular pressure measured with Goldmann applanation tonometer, gonioscopy, fundus examination both with direct and indirect ophthalmoscope.

Haemoglobin percentage, urine routine examination, screening for Hepatitis B and Hepatitis C and blood pressure were checked whereas blood glucose, blood urea, X-Ray chest posterior-anterior view and electrocardiogram were done if indicated. Slit lamp photograph of the anterior segment and fundus were taken and. Automated perimetry changes were noted.

Informed consent was taken from all patients and a separate data collecting proforma was filled for every patient.

After examination the patient was prepared for surgery. On the table local anaesthetic was given and pressure bandage was applied until the eye was completely akinetic and anaesthetized. Surgery was started under full aseptic condition. The sclera was exposed at the upper nasal limbal zone. In group 1 a sponge soaked with 0.4 mg/ml Mitomycin C was applied at the filtering site on the upper nasal limbus for 2 minutes, and the area was washed out with a balanced salt solution. A fornix based conjunctival flap was formed in the superior nasal quadrant, followed by a 4x4 mm rectangular partial thickness scleral flap, which was prepared by dissecting the sclera forward into the clear cornea. An internal section of the trabecular meshwork was removed and a small peripheral iridectomy was performed in the same region. The scleral flap was closed with two 10/0 nylon suture. The conjunctival wound was closed with 8/0 virgin silk sutures. Subconjunctival injection of Dexamethasone and Gentamycin was given and 1% Atropine drops were instilled. Aseptic dressing was applied. In group 2, same procedure was used but without the use of Mitomycin C. Postoperative visual acuity, intraocular pressure, anterior chamber depth, hyphaema and bleb formation were examined and compared on 1st day, 1st week, 4th week, and 8th week.

All the studied variables were analyzed for comparative statistics. For categorical variables like type of glaucoma, preoperative visual acuity, cup disc ratio, co-morbidity, postoperative visual outcome, bleb formation, anterior chamber depth, postoperative hyphaema, additional use of drugs and postoperative complications, were determined. Mean ± standard deviation was calculated for age. For sex distribution male to female ratio was also calculated. Chi square test was applied to the data in order to measure the association between intraocular pressures among the patients. Postoperative intraocular pressure was assessed and compared. P-value was calculated to find out the degree of significance, which is less than 0.05. Data interpretation, calculations, tabulations and various others, analytical procedures were done by using computer program SPSS for windows version 11.

RESULTS

Among these 80 patients 50 (62.5%) were male and 30 (37.5%) were female with ratio of 1.66:1, as shown in Fig: 1. The mean age was 52.1 years with ± standard deviation of 14.07. Different types of glaucoma included in the study are given in Table: 1. In 50 eyes (50%) trabeculectomy with intraoperative Mitomycin C, while in another 50 eyes (50%) standard trabeculectomy without MMC was performed as primary procedure.

Preoperative visual acuity is shown in Fig: 2. Preoperative cup-disc ratio is shown in Fig: 3. At presentation the IOP was ranged from 23-60 mm of Hg, with mean 31.47 ± 14.07 standard deviation. Pre-operative intraocular pressure distribution is given in Table: 2. Visual outcome in these patients after two months of follow up was compared and is shown in Fig: 4. Visual acuity remained unchanged in 37 eyes (74%) in group 1 and 39 eyes (78%) in group 2, improved in 7 eyes (14%) in group 1 and 7 eyes (14%) in group 2 and deteriorated in 6 eyes (12%) in group 1 and 4 eyes (8%) in group 2. Bleb formation was assessed and...
shown in the Table 3. After 8 weeks of follow up, well formed bleb was found in 46 eyes (92%) in group 1 and 44 eyes (88%) in group 2. Flat bleb was found in 4 eyes (8%) in group 1 and 6 eyes (12%) in group 2.

Postoperative intraocular pressure was assessed and compared by using Chi-Square Test. The IOP distribution is shown in the table 4. Mean IOP on 1st day, 1st week, 4th week and 8th week was 9.04, 11.29, 12.08 and 12.44 respectively in cases of group 1 and 9.50, 11.90, 12.60 and 13.82 in cases of group 2. Although the mean IOP at 8th weeks was lower with MMC which was statistically significant (P = .049). The Final success rate of trabeculectomy with and without MMC was 86% and 84% respectively, which was not statistically significant (P = .121) After eight weeks of follow up, 7 eyes (14%) in group 1 and 8 eye (16%) in group 2 had IOP greater than 21 mm Hg and were considered as failed procedures. They were put on additional antiglaucoma drugs.

**DISCUSSION**

Glaucoma is a group of disease characterized by progressive visual field defects and optic nerve head cupping in which raised intraocular pressure is a major risk factor. Its etiology is multi-factorial and usually affects older

![Figure 1: Gender Distribution (N=80)](image)

<table>
<thead>
<tr>
<th>Types of Glaucoma</th>
<th>No. of Eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>POAG</td>
<td>47</td>
<td>47%</td>
</tr>
<tr>
<td>PACG</td>
<td>32</td>
<td>32%</td>
</tr>
<tr>
<td>SIG</td>
<td>16</td>
<td>16%</td>
</tr>
<tr>
<td>PEX</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Pigmentary</td>
<td>2</td>
<td>2%</td>
</tr>
</tbody>
</table>

**KEYS:**
- **POAG** = Primary Open Angle Glaucoma
- **PACG** = Primary Angle Closure Glaucoma
- **SIG** = Steroid Induced Glaucoma
- **PEX** = Pseudo-exfoliative Glaucoma

![Figure 2: Preoperative Visual Acuity (N=100)](image)

![Table 2: Preoperative intraocular pressure distribution (N=100)](image)

<table>
<thead>
<tr>
<th>Intraocular Pressure Range</th>
<th>No. of Eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-30 mmHg</td>
<td>49</td>
<td>49%</td>
</tr>
<tr>
<td>31-40 mmHg</td>
<td>25</td>
<td>25%</td>
</tr>
<tr>
<td>41-50 mmHg</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td>51-60 mmHg</td>
<td>12</td>
<td>12%</td>
</tr>
</tbody>
</table>

![Figure 3: Cup Disc Ratio (N=100)](image)
Individuals. Main purpose of glaucoma management is to prevent blindness by lowering IOP. Different treatment modalities are available like drugs, lasers and surgical intervention.

In developed countries, ophthalmologist usually uses surgical intervention after exhausting medical and laser treatment. In our setup, treatment of choice is surgical intervention due to poverty, illiteracy, poor drug compliance, late presentation and higher failure rate of laser trabecuoplasty. The method of choice is trabeculectomy with or without Mitomycin C. Different studies show different results. There has been debate regarding the timing of trabeculectomy in glaucoma patients. Advocates of primary surgery report success rates of approximately 90%.

Moreover, trabeculectomy is associated with a decrease in number of medications needed to control disease progression. After medical treatment, the success rate of trabeculectomy is lower, ranging from 45% to 93%. Filtering surgery has a higher failure rate in younger than older patients because of severe postoperative inflammatory response. Fibrosis at the level of episcleral and subconjunctival space is the most common cause of failure after trabeculectomy. To reduce the incidence of postoperative fibrosis, currently two anti-metabolites, fluorouracil (5-FU) and Mitomycin C (MMC) are available. MMC is better than 5-FU as it effectively reduces IOP, decreases dependence on postoperative antiglaucoma therapy and decreased corneal toxicity. Some authors recommend use of mitomycin-C in all cases but due to higher rate of complications like bleb leak, hypotony, blebitis, endophthalmitis and choroidal haemorrhage, most of the surgeons reserve its use for patients with high risk of failure.

This study includes 100 eyes of 80 patients. In 50 (50%) eyes, trabeculectomy with intraoperative MMC was the primary surgical procedure and in other 50 (50%) eyes standard trabeculectomy without MMC was performed. The basic aim of the study was to compare the effectiveness of trabeculectomy with and without MMC in lowering IOP without the use of antiglaucoma drugs. In this study 62.50% of patients were male and 37.50% of patients were female. The youngest patient was 17 year male and the oldest was of

Table 3
Bleb Formation (N=100)

<table>
<thead>
<tr>
<th>Duration</th>
<th>Well formed Bleb</th>
<th>Flat Bleb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group I (n=50)</td>
<td>Group II (n=50)</td>
</tr>
<tr>
<td>1st Day</td>
<td>47</td>
<td>45</td>
</tr>
<tr>
<td>1st Week</td>
<td>47</td>
<td>45</td>
</tr>
<tr>
<td>4th Week</td>
<td>46</td>
<td>44</td>
</tr>
<tr>
<td>8th Week</td>
<td>46</td>
<td>44</td>
</tr>
</tbody>
</table>

Keys: Group I = Operated with Mitomycin C
Group II = Operated without Mitomycin C

Table 4
Post Operative Intra Ocular Pressure (N=100)

<table>
<thead>
<tr>
<th>Duration</th>
<th>≤ 15</th>
<th>16-21</th>
<th>≥ 21</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group I (n=50)</td>
<td>Group II (n=50)</td>
<td>Group I (n=50)</td>
<td>Group II (n=50)</td>
</tr>
<tr>
<td>1st Day</td>
<td>45</td>
<td>43</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>1st Week</td>
<td>43</td>
<td>40</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>4th Week</td>
<td>36</td>
<td>34</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>8th Week</td>
<td>33</td>
<td>31</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

Keys: Group I = Operated with Mitomycin C
Group II = Operated without Mitomycin C

Mean Post-OP IOP at 8th week
Group I: 12.44 with standard deviation of ± 1.94
Group I: 13.82 with standard deviation of ± 4.
70 years of age. Most of the patients were of 40 years of age and above and is consistent with the study conducted by Fontana and Brubaker.17

Common types of glaucoma were primary open angle (47%), followed by primary angle closure (32%), steroid induced glaucoma (16%), pseudo-exfoliative glaucoma (3%) and pigmentary glaucoma (2%).

Preoperative best corrected visual acuity was noted ranging from 6/6 to PL+. In most of the cases trabeculectomy did not improve the visual acuity and remained same, while in some cases there was one or two lines improvement, while in few cases, it worsened. There was no significant difference between the two groups in term of visual outcomes.

Preoperative intraocular pressure (IOP) was taken ranging from 23 mmHg to 60 mmHg. The mean IOP was 31.47 mmHg with standard deviation of ± 10.37. 74% of patients had IOP of 23-40 mm Hg and remaining 26% of patients had IOP of 41-60 mmHg. In my study, patients with steroid induced glaucoma, pseudo-exfoliative glaucoma and pigmentary glaucoma presented with higher IOP (usually greater than 35 mmHg) than primary open angle and angle closure glaucoma. Co-morbidity like iris atrophy (6%) band degeneration (3%), corneal opacity (2%) and chronic dacyrocystitis (3%) was noted and managed accordingly.

Postoperatively, blebs and anterior chamber depth were assessed between the two groups. The bleb was well formed between group 1 and group 2 (92% versus 88% respectively) and there was no single leakage at 8th week in either group, while some studies shows higher frequency of leaky bleb with MMC. Anterior chamber (AC) was shallow either group, while some studies shows higher frequency of AC in either group which was consistent with the study conducted in Pakistan.17 The shallow anterior chamber was mostly due to excessive filtration in either case and were successfully treated with patching.

Post operative intraocular pressure IOP was taken at 1st day, 1st week, 4th week and 8th week and it was noted that there was no significant difference between the two groups. At the end of the follow up IOP <15 mmHg was achieved in 33 (66%) eyes in group 1 versus 31 (62%) eyes in group 2. IOP >21 was noted in 7 (14%) eyes in group 1 versus 8 (16%) eyes in group 2. IOP >21 at the end of the follow up was considered failed. In group 1, 7 (14%) eyes were put on antiglaucoma drugs and in group 2, 8 (16%) eyes were put on antiglaucoma drugs. Although there was no significant difference between the two groups over success rate (P = .121), there was a greater decrease in IOP in group 1 (P = .047) The final success rate was 86% in group 1 and 84% in group 2 which is consistent with many studies.

Although this study was small but it was comparable with most of the studies conducted worldwide. Trabeculectomy is a safe procedure and should be performed by experienced surgeon. As the success rate was not significantly different between the two groups, trabeculectomy alone without the use of anti-metabolite is advocated in non complicated glaucoma. Although the follow-up was for short period of time, further follow-up will be required for long term evaluation.

CONCLUSION:
Glaucoma is a common vision threatening condition affecting both sexes. It is more likely to occur in older individuals. Patients present with different types of signs and symptoms, depending upon the type of glaucoma. The most common of which is decreased visual acuity. In our setup patients usually present with advanced disease, so the treatment of choice is surgical intervention due to late presentation, poor drugs compliance and poverty. Trabeculectomy without MMC is as effective as trabeculectomy with MMC.

Surgical procedure is cost effective and reduces the use of life long antiglaucoma drugs. Drugs side effects can be avoided with surgical procedures, if carried out by an experienced surgeon.

REFERENCES
Comparison of the efficacy of Subconjunctival Anesthesia with Peribulbar Anesthesia in Cataract Surgery

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Medical Officers, Khyber Teaching Hospital, Peshawar
Prof. Nasir Saeed, FCPS
Professor of Ophthalmology, Hayatabad Medical Complex, Peshawar

ABSTRACT

Purpose: The purpose of the study is to compare the efficacy of subconjunctival anesthesia with peribulbar anesthesia in cataract surgery.

Method: Patients admitted for cataract surgery were divided into two groups each containing 100 patients after informed consent. Group IAi receiving subconjunctival anesthesia and group IBi receiving Peribulbar anesthesia.

Results: The two groups were almost similar in terms of age and sex distribution. During administration of subconjunctival anesthesia, 88 patients experienced no pain while in group IBi, 4 patients experienced severe pain, 83 patients moderate pain and 2 patients suffered vasovagal shock. During surgery in group IAi 82 patients were comfortable only 4 patients required augmentation with subconjunctival anesthesia . In group IBi, 56 patients were comfortable and 20 patients required augmentation. In group IAi, 7 patients experienced light discomfort.

Conclusion: The subconjunctival anesthesia is an excellent technique as it is pain free and avoids all the complications attributed to blind infiltration technique and yet as effective as peribulbar anesthesia.

Keywords: Subconjunctival anesthesia, Peribulbar anesthesia, Pain, Light stress

INTRODUCTION:

Cataract is the leading cause of avoidable blindness all over the world\(^1\). There has been a dramatic change of anesthesia practice for ophthalmic surgery over the past decade \(^2\). Cataract extraction under general anesthesia has only been limited to children and mentally handicapped patients. Retrobulbar anesthesia and facial block, because of significant complication such as globe perforation, \(^3\) central retinal vessels occlusion, brain stem anesthesia \(^4\) and postoperative blepharoptosis \(^5\) have now been replaced by peribulbar, topical and subconjunctival anesthesia \(^6\). Subconjunctival anesthesia is an excellent technique as it is pain free and avoids all the complications attributed to blind infiltration technique \(^6\). Subconjunctival anesthesia should be performed particularly in patients with the problems of ocular perfusion (for example, glaucoma) as peribulbar anesthesia induces high reduction of velocity in retrobulbar vessels \(^7\). As most of the patients retain some visual function during cataract surgery under local anesthesia; the anesthesia provider should offer appropriate preoperative information and counseling to their patients \(^8\).

MATERIAL & METHODS:

This is a randomized controlled study conducted at the Department of Ophthalmology Khyber Teaching Hospital, Peshawar. Study was carried out on 200 patients admitted for cataract surgery from March 2008 to march 2009. Patients were divided into two groups labeled as “A” for 100 patients reviving subconjunctival anesthesia and “B” for 100 patients receiving peribulbar anesthesia. Subconjunctival anesthetic injection was given as 0.5 ml of 2% xylocain with 1:200,000 adrenaline at 12 O’ clock above the limbus and peribulbar anesthetic injection was given as 5 ml xylocain with 1:200,000 adrenaline at two sites i.e. inferotemporally and mediayl in the Peribulbar area. Pain experienced during anesthetic injection and during surgery were graded using a standardized verbal descriptive pain scoring chart used by Koay and Nasir Saeed (Table 1). Light stress experienced during surgery was also graded according to verbal scoring method, given bellow. Augmentation required were also noted.

RESULTS:

The two groups were almost similar in age and sex distribution. The mean age in group “A” was 58.78+_2.65 and group “B” was 58.25+_2.19. During subconjunctival anesthetic injection, 88 patients experienced no pain while 5 patients experienced only mild discomfort and 7 patients experienced mild pain. In group “B”, 4 patients experienced severe pain, 83 patients experienced moderate pain that required intramuscular pain killer for pain relief, 11 patients experienced mild pain and even 2 patients developed vasovagal shock. (table-2)

During surgery in group “A”, 82 patients experienced no pain, 12 experienced discomfort, 2 mild pain and 4 patients experienced severe pain. In group “B”, 56 patients no pain, 14 discomfort, 7 mild pain, 15 moderate pain and 5 patients experienced severe pain that required augmentation with subconjunctival anesthesia (table-3).

During surgery only in group “A”, 7 patients

Table No: 1

<table>
<thead>
<tr>
<th>Standardized verbal pain scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 No pain</td>
</tr>
<tr>
<td>2 Mild discomfort</td>
</tr>
<tr>
<td>3 Mild pain</td>
</tr>
<tr>
<td>4 Moderate pain</td>
</tr>
<tr>
<td>5 Severe pain</td>
</tr>
</tbody>
</table>

Tolerable

Tolerable with counseling

Required augmentation

Required augmentation

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experienced slight light discomfort. In group “A” 6 patients required augmentation while in group “B” 24 patients required augmentation that was given as subconjunctival anesthetic injection. Only one patient developed subconjunctival hemorrhage.

**DISCUSSION:**

Peribulbar anesthesia is the gold standard for cataract surgery. This technique involves blind infiltration into the orbit which can result in various complications like globe penetration, Retrobulbar hemorrhage, brain stem anesthesia, central retinal vessels occlusion and post operative blepharoptosis. Local anesthesia has always been the focus of all ophthalmologists and different methods have been tried so far like topical, subtenon and subconjunctival anesthesia.

In our study almost all patients did well except few who required augmentation, developed subconjunctival hemorrhage or felt slight light discomfort. We could never attain full akinesia during surgery but the problem was overcomed with verbal commands and superior rectus bridle suture and all surgeries were done successfully. Sherma, M., et al has also studied efficacy of subconjunctival anesthesia and has found that most of the patients experienced no pain during anesthetic injection and during surgery. Herber et al has studied retrobulbar anesthesia versus subconjunctival anesthesia and has found that most of the patients experienced no pain during anesthetic injection and during surgery. She has also studied efficacy of single site with double sites Peribulbar anesthesia in cataract extraction. Pak J Ophthalmol 2005; 15:152-6.

In our study almost all patients did well except few who required augmentation, developed subconjunctival hemorrhage or felt slight light discomfort. We could never attain full akinesia during surgery but the problem was overcomed with verbal commands and superior rectus bridle suture and all surgeries were done successfully. Sherma, M., et al has also studied efficacy of subconjunctival anesthesia and has found that most of the patients experienced no pain during anesthetic injection and during surgery. Herber et al has studied retrobulbar anesthesia versus subconjunctival anesthesia and has found that most of the patients experienced no pain during surgery and there were few intraoperative and postoperative complications.

**CONCLUSION:**

Subconjunctival anesthesia as an alternative to peribulbar anesthesia in cataract surgery is recommended. This technique is safer then peribulbar anesthesia because it is performed under direct visualization. Further potential benefits are the smaller volume required, minimal risk of globe perforation and reduces surgical time, as it is not necessary to wait as required in case of peribulbar block.

**REFERENCES**

How to Diagnose Glaucoma based on Sinking Disc

Dr. Syed S. Hasnain M.D. General Ophthalmology
560 W. Putnam Ave. Suite #6 Porterville, CA 93257

INTRODUCTION:

In order to diagnose glaucoma based on sinking disc we have to remember two new paradigms in glaucoma. These new paradigms will replace the currently used paradigms of cupping and neuropathy of the optic disc which may not be occurring in glaucoma.

New Paradigm # 1. Optic disc is continuously sinking in its entirety in glaucoma, not cupping.

New Paradigm # 2. Axons are being severed (axonotomized) not atrophied in glaucoma.

Ignore every thing about optic disc including physiological cups whether they are 0.2 or 0.8. We have to determine one thing only: whether the optic disc is sinking or not?

Retinal nerve fibers lie in a layered fashion. Sinking of the optic disc results in severance of axons which in turn results in depletion and thinning of the RNF layer. As a result of thinning the RNF layer becomes more transparent therefore allowing the deeper structures like scleral rim and border tissue to be seen clearly which are normally not visible due to normal thickness of the RNF layer.

We can’t see the transparent axons but can follow the course of blood vessels as they cross the disc margin. If the course of blood vessels on the disc margin is straight and the optic disc appears flush with retina, there is no glaucoma. As the optic disc starts sinking the blood vessels will also start sloping in pursuit of sinking disc. It doesn’t matter whether someone is born with 0.2 cup or 0.8 cup. We have to determine three stages.

Early stage: Earliest sign of glaucomatous disc will be visibility and prominence of the border tissue and scleral edge/rim due to thinning of the RNF layer. The temporal area of the disc will appear somewhat pale. As the sinking progresses and the RNF layer becomes further thin, the border tissue will become more visible and the blood vessels will also appear sloping. The temporal area will begin to appear shallow, sunken and pale due to severance of the axons and its vasculature.

Intermediate Stage: As the sinking progresses further the physiological cup will be obliterated due to confluence of cup’s usual pallor and the pallor produced in the temporal part by the destruction of the axons and its vasculature. This may be taken as an enlargement of the physiological cup but it is not true enlargement but de-cupping of the physiological cup. When the physiological cup becomes obliterated, it may be called an intermediate stage.

As the sinking is advanced the sloping of the blood vessels will turn into kinking at the disc margin due to depletion of the underlying axons. Visual fields defects will appear on perimetry. Splinter hemorrhage due to severing of the blood vessels may also begin to appear at the disc margin. Area around the disc margin will appear bald due to severance of smaller vessels, a very valuable sign.

Late to End-stage: In the later stages the more of the disc area appears sunken, pale and excavated. Central vessels begin to shift nasally due to deletion of temporal axons, a very characteristic feature since no other disc disease will do it except in cases of high myopia. Due to extreme thinning or absence of the RNF layer the entire scleral opening becomes visible. Smaller vessels have disappeared after being severed whereas the larger blood vessels are left hanging on the scleral edge/rim. Histology of the end-stage glaucomatous disc reveals an empty crater. There are no axons and no lamina, probably lying at the bottom of the empty crater like a sunken ship. End-stage empty crater is unique feature of glaucoma since the axons are being severed not atrophied unlike other kinds of optic nerve disease such as due to multiple sclerosis in which the axons are being atrophied but not severed.

Kindly visit our website: www.hasnaineye.com for power point slides of different stages of the glaucomatous discs based on sinking disc.

Just remember, NO SINKING, NO GLAUCOMA

(Ophthalmologists will be entering a new world of glaucoma by evaluating the disc based on sinking. Please give it a chance and see the results yourself….Editor)
INTRODUCTION:

The Neodymium yttrium Aluminium Garnet (Nd: YAG) is a type of laser which has 1064 nm of wavelength with infrared radiation. Its photodisruptive characteristic is used for posterior capsulotomy (1). Extracapsular cataract extraction and Phacoemulsification is the most commonly performed procedure in ophthalmology. Posterior capsular opacification (PCO) is the most common late complication of modern day cataract surgery (2). PCO develops within 2-3 years of extracapsular cataract surgery in almost 25-50% of eyes (3). Opacification in the posterior capsule is more earlier in onset in younger patients (4). Posterior capsular opacification (PCO) is reported to be more with certain intraocular lens (IOL) materials. Its incidence is on decreasing order from Polymethyl Methacrylate (PMMA) to Silicone and Acrylic (5,6). It has also been noted to be less with square edged intraocular lenses (7). PCO is of different types. It may be fibrotic type, Elschnig pearls or wrinkling in the capsule (8).

Nd-YAG laser has now completely replaced surgical capsulotomy (8). YAG laser capsulotomy is most commonly performed for diminished visual acuity (VA), diplopia, glare, and inadequate fundus view in pseudophakic and aphakic eyes (10). This procedure though simple and convient, is associated with some complications like transient rise of intraocular pressure (11-13), corneal endothelial damage (14-16), cystoid macular edema (when done before 6 months of surgery) (17), IOL pitting and uveitis (18), and retinal detachment (especially in myopes). Very rarely, recurrent endophthalmitis following yag laser capsulotomy has also been reported (19).

MATERIALS AND METHODS:

Two hundred and fifty patients who had different types of posterior capsular opacification were treated with Yag laser. These patients were seen in eye unit, Khyber Teaching Hospital Peshawar from 1st May, 2009 to 1st June, 2010. A proforma was designed for the collection of data.

Patients were examined in detail recording visual acuity, slit lamp examination of the anterior segment, intraocular pressure recording and dilated fundoscopy. In case of dense posterior capsular opacification, B-Scan ultrasonography was used to exclude posterior segment pathology. Abraham capsulotomy contact lens was used in all cases. Pupils were dilated in all of the cases. For posterior capsulotomy, we used two point Neodymium YAG laser. Wavelength of therapy was 1064 nm. Post laser treatment included Fluorometholone 0.1% eye drops four times a day and timolol maleate 0.5% eye drops twice daily for one week both. Patients were reexamined at 1 week and 1 month.

RESULTS:

Two hundred (80%) of the patients were male and fifty (20%) were female. Mean age was forty years ranging from 10-70 years. All of the patients who underwent capsulotomy were having posterior chamber IOL implantation. The time period between cataract extraction and capsulotomy was 6 months and five years.

The energy level required for adequate capsulotomy ranged from 0.8 mj to 5 mj while total energy required per case ranged from 10 mj to 380mj. (Table 1 and Figure 1) In our study, we found that capsular fibrosis was more common than Elschnig pearls. (Table 2 and Figure 2) Eight patients developed mild anterior uveitis which settled with topical steroids. In two patients, intraocular pressure was noted to be raised (5 mmHg or more) on chronic basis. One patient who was myopic developed retinal detachment. IOL pitting occurred in two cases. (Table 3 and Figure 3)

DISCUSSION:

With the advancement in cataract surgery and new developments like phacoemulsification, posterior capsular...
TABLE 1:
Nd: Yag Laser Energy Applied

<table>
<thead>
<tr>
<th>Energy</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 mj</td>
<td>40%</td>
</tr>
<tr>
<td>2-3 mj</td>
<td>51.2%</td>
</tr>
<tr>
<td>3-5 mj</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

TABLE 2:
Type Of Posterior Capsular Opacity

<table>
<thead>
<tr>
<th>Capsular condition</th>
<th>No of patients</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capsular fibrosis</td>
<td>155 patients</td>
<td>62%</td>
</tr>
<tr>
<td>Elschnig pearls</td>
<td>89 patients</td>
<td>35.6%</td>
</tr>
<tr>
<td>Wrinkling of posterior capsule</td>
<td>6 patients</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Conclusions:
Nd: YAG laser capsulotomy is a safe and effective method to treat posterior capsular opacification. It is far more safer and less traumatizing than surgical capsulotomy especially if lower energy levels and lesser number of shots are used in conjunction with capsulotomy lens.

References:
1. Elkington RA, Frank JH, Greaney JM. Lasers in ophthalmology,

Case Report

Non-resolving Conjunctival Edema

The patient is a poorly controlled diabetic for the past 15 years. He had NVD in both his eyes for which he underwent PRP and multiple intra-vitreal injections of Avastin; he underwent a 20 G PPV with encirclement in July 2010 for recurrent vitreous hemorrhages in the left eye. The conjunctival fold failed to resolve postoperatively. The patient is on topical antibiotics & steroid drops + oint (HS) since the surgery.

VA is hand movements (conjunctival folds + cataract). Visible cornea is totally clear. It is pretty difficult to manipulate the folds to get them off the cornea completely. As the conjunctiva is covering the cornea it is not possible to get an accurate pressure reading without manipulating the eye. Digitally both eyes are comparable. B-Scan shows flat retina with clear vitreous.

The initial surgery was performed on 14th July. Pre-operatively conjunctiva was normal, with no pathologies. The eye had recurrent vit. hemorrhages. His diabetes was controlled prior to surgery. The patient did not complain of pain, only discomfort. We plan to do a conjunctival excision (redundant) with band removal. The chemosis is almost 360 deg. which may well be due to lymphatic obstruction. However it is also interesting to note that the pt has been on eye drops ever since he had surgery. If he is allergic to one of the ingredients in the eye drops (usually Neomycin or preservative), probably, we can’t rule out an inflammatory process. The subject is open for discussion.

(Courtesy: Dr. Amena Ali, Online)
INTRODUCTION:
Assessment of visual impairment in children has been identified as a priority in the World Health Organization’s VISION 2020 – The Right to Sight1. It has been estimated that there are 1.5 million severely visually impaired children worldwide. School going children are at risk of becoming visually impaired, because they are actively growing and subjected to the strain of studies and demanding academic schedules.

Like other parts of the world, visual impairment is also a public health problem of children in Pakistan. To get the relative information on this, a population-based survey was planned in Peshawar District. Out of a list of schools in Peshawar, 4 schools were selected for survey on the basis of location (rural/urban), the criteria for their selection was to get a sample population of school going children who best represented the whole population of the Peshawar District.

The Survey was carried out under the title “To find out Visual Impairment in school going children Urban/Rural Areas” which was done with the help of Snellen’s Charts. This is a quick, easy, relatively cheap and internationally accepted procedure to assess the visual impairment in accordance with the results of such type of population-based surveys carried out previously in other parts of the world.

MATERIAL & METHODS:
This was a cross-sectional population based survey conducted with the help of students of Khyber Medical College to find out the visual impairment in the school of urban and rural areas of Peshawar district. The entire school going children were our target population which were about 4.42 lacs.

Based on Multi-stage cluster sampling, District Peshawar is subdivided into about 92 union councils but in all the union councils, the number of students is not equal. So we combined the nearby and small union councils with one another which gave us a final no of 70 clusters, 46 Rural and 24 Urban. Although it was impractical to visit all the 70 clusters areas, so we decided to choose 2 clustering areas each from the rural and urban areas. The clusters were determined randomly from the list which included rural clusters: Chamkani, Palosi & Talarazi, Urban Clusters included: Mahal Teri No 1 & 2 and Hayatabad. The sample for the survey was calculated by using the tables calculated by “Sample size determination in health studies” by S K Lwange and S. Lemeshow 16.

Although the total calculated sample size was 900 but to make it more reliable and acceptable we increased the sample size to about 1000 individuals and decided to check
the visual acuity of about 250 students in each of the four selected schools. The students for this purpose were selected by systematic random sampling technique and were divided into 3 age groups, which were 5 to 8 years (271), 9 to 12 years (453) and 13 to 15 years (245). The criteria for students of visual impaired was according to the WHO definition (ICD-10).

Data for the study was collected through a questionnaire. The survey was completed in three months. After the collection of the data, it was analyzed with the SPSS software.

**RESULTS**

Total population of the survey area was 2,748,409; Target age group was between 5-15 years. Total population of the target age group was 442,811. A total of 974 out of 1000 students were screened with a total response rate 97.4 percent in the four schools. The mean age of children was 10.35± 5.48 years, with a range of 5 to 15 years. There were 589 (60.47%) male students and 385 (39.53%) female students. Among the total students screened about 40 (4.1%) of the students were having visual acuity less than 6/18 (according to WHO definition). Out of these 21 (2.15%) were unilaterally impaired and 19 (1.95%) were bilaterally impaired Table 1. The students were divided into 3 age groups, which were 5 to 8 years (271), 9 to 12 years (453) and 13 to 15 years (245) and the visual impairment in all the age groups was 11 (4.06), 16 (3.54) and 13 (5.06) respectively Table 2. The sex distribution of visual impairment was 21 out of 589 (3.57%) in males while 19 out of 385 (4.94%) in females The area distribution of the visual impairments showed that about 30 out of 541 (5.18%) in the urban students while 12 out of 433 (2.77%) in the rural students Table: 3. Category wise distribution of the impairment showed that about 30 out of 40 (75%) students fell in the 1st category of visual impairment. 5 (12.5%) students had 2nd category of visual impairment. 2 (5%) each in category 3 and 4 while 1 (2.5%) was having both 1st and 2nd category of visual impairment. Those students who were having visual impairment were further grouped into 2 on the basis that whether their vision improved with or without pin hole. The vision of 25 out of 40 (62.5%) students improved with pin hole and they were said to be having refractive type of error while 13 (32.25%) students didn’t showed any improvement with pin hole and they were grouped into non-refractive type of error. Pin hole for 2 (5%) students couldn’t be done: Table 4. The number of students using glasses was 48 (4.9%) and among these 28 students didn’t had glasses at the time of screening either because the glasses were broken or they were not using them continuously. Out of those 28 students who were not having spectacles 9 (32.14%) students were visually impaired according to the WHO definition (ICD-10).

**DISCUSSION**

Assessment of visual impairment in children has been identified as a priority in the World Health Organizations VISION 2020 – The Right to Sight1. It has been estimated that there are 1.5 million severely visually impaired children worldwide1. School going children are at risk of becoming visually impaired, because they are actively growing and subjected to the strain of studies and demanding academic schedules. Like other parts of the world, visual impairment is also a public health problem of children in Pakistan. To get the relative information on the population-based survey was planned in Peshawar District. In this survey, WHO acceptable criteria for visual impairment was used which is visual acuity of less than 6/18 in the better eye with best possible (available) correction (International statistical Classification of Diseases. ICD-10). The age criteria for this study were children aged 5 to15 years. During this survey from a total of 1000 students, 974 children were examined out of which 40 students were visually impaired showing a prevalence of 4.1% which is in accordance with the prevalence of visual impairment in children of European Countries. Among the above 40 students, 21(2.15%) had unilateral visual impairment and 19(1.95%) had bilateral visual impairment. Considerable difference in the prevalence between age groups has been demonstrated in this study. In the age group of 5-8 yrs, prevalence of visually impaired children was 4.06%. In the age group of 9-12yrs 3.53% children were visually impaired and in the age group of 13-15yrs of age prevalence of visually impaired children was 5.31%. With increasing age children have to cope with tougher studies, therefore prevalence of visual impairment becomes high as age advances. These results were in agreement to the findings of Bataineh AH4 and Khatabeh AE5, Kalikivayi6 and Junghans et al while no association was found by Muthy et al7 and by Haseeb Alam et al8.

The parameter of this study was to find out the difference in gender wise distribution of visual impairment. In males, the prevalence of visual impairment was 3.56% whereas in females it was 4.94% with p=46, which is not significant and this shows that there is no association between gender and visual impairment. This is in accordance with the other studies done by Bataineh’and Khatabeh9, Kalikivayi et al9, Junghans et al and Garner et al. While the studies done Afghani et al10 Khan et al11 Khandekar12 Dandona et al13 showed a significant association between visual impairment in children. Another finding of this study was difference in the prevalence of visual impairment among

<table>
<thead>
<tr>
<th>Population</th>
<th>Number of Bilateral V.I</th>
<th>Prevalence</th>
<th>Number of Unilateral V.I</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 974</td>
<td>19 Students</td>
<td>1.95%</td>
<td>21 Students</td>
<td>2.15%</td>
</tr>
<tr>
<td>Target Population 442,811</td>
<td>8,635 Students</td>
<td>1.95%</td>
<td>9,521 Students</td>
<td>2.15%</td>
</tr>
</tbody>
</table>
children were unaware of the visual impairment and even if they did, they neglected it.

**CONCLUSIONS**

The conclusions drawn from the whole project were that prevalence of visual impairment is significantly higher in urban areas than in rural, indicating effect of the former’s life style. The visual impairment prevalence increased with the advancing age showing changes in activities of children. Most of the children were ignorant of their refractive errors which could have been corrected easily with glasses and even if they did, they had neglected it. So proper education and counseling is the need of the hour to save the future of these children, because if they cannot see the world, they cannot learn.

**REFERENCES**

16. “Sample size determination in Health studies” by S. K. Lwanga and S. Lemeshow.

**Table 2**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No of Students</th>
<th>Visual Impairment</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>5yrs to 8yrs</td>
<td>271</td>
<td>11</td>
<td>4.06</td>
</tr>
<tr>
<td>9yrs to 12yrs</td>
<td>453</td>
<td>16</td>
<td>3.54</td>
</tr>
<tr>
<td>13yrs to 16 yrs</td>
<td>245</td>
<td>13</td>
<td>5.31</td>
</tr>
<tr>
<td>Total</td>
<td>974</td>
<td>40</td>
<td>4.11</td>
</tr>
</tbody>
</table>

**Table 3**

Prevalence of Visual Impairment in Rural and Urban Areas

<table>
<thead>
<tr>
<th>Area</th>
<th>Examined Students</th>
<th>Students having VI</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>541</td>
<td>28</td>
<td>5.18</td>
</tr>
<tr>
<td>Rural</td>
<td>433</td>
<td>12</td>
<td>2.77</td>
</tr>
<tr>
<td>Total</td>
<td>974</td>
<td>40</td>
<td>4.1</td>
</tr>
</tbody>
</table>

**Table 4**

Percentage of Type Error in School going children

<table>
<thead>
<tr>
<th>Type of Visual Impairment</th>
<th>No of Students</th>
<th>Total Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractive Error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SingleEye</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>DoubleEye</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Non-Refractive Error</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>38</td>
</tr>
</tbody>
</table>

children according to the area to which they belong. Children from urban areas had a high prevalence (5.18%) of visual impairment than those belonging to rural areas where prevalence was low (2.27%) which is similar to the results found in the study done by Murthy et al. This difference might be due to the difference in standards of gadgets such as computers and video games etc, and the educational standards of school are also high which may be the possible reason behind high prevalence of impaired vision in children of urban areas. Category wise distribution of children on the format of ICD-10, showed that 75% children fell in category 1(VA maximum<6/18; minimum e” 6/60 with the best possible (available) correction), 12.5% children fell in category 2 (VA maximum < 6/60; minimum e” 3/60 with best possible (available) correction). 10% children fell in categories 3 & 4. Category 1 and 2 was called ‘Vision’ while Category 3, 4 & 5 was called ‘Blindness’ (WHO definition). Other important finding was that the prevalence of refractive errors was 2.57% and that of non-refractive errors was 1.34% while in 2 children the error couldn’t be determined. It was almost the same as shown by the study of Mingguang et al. But the study done in Malaysia showed different results. Visual Impairment was differentiated into refractive and non refractive errors on the basis of improvement in vision with pin- hole used during visual assessment. Out of the total of 974 children, only 48 (4.9%) used glasses while 28 didn’t have the glasses at the time of examination because they were either not using the glasses or their glasses were broken. This shows that majority of the
INTRODUCTION

Opacification of the posterior capsule is a common sequel to extra capsular cataract extraction (ECCE) with an intact posterior capsule. Posterior capsular opacification (PCO) stems from the continued viability of the lens epithelial cells remaining on the anterior or posterior capsule after removal of the cortex and nucleus. The incidence varies with the age of the patient, difference in surgical techniques, design of IOL implant and period of follow up. In adults its incidence is reported to be 18% to 50%, within 3 to 5 five years of surgery. Posterior capsular opacification accounted for 3.6% of blindness in adults (age > 30) in Pakistan. There is an age-related tendency towards posterior capsular opacification. It is higher in children and young adults. Posterior capsule opacification requiring secondary surgical membranectomy developed in 22.7% of the children. Younger children developed PCO more often than older children and within 2 years it approaches to 100%. Although the thickened posterior capsule can be treated by capsulotomy with knife, YAG Laser is preferred because it is non-invasive. In 1980, Aron Rosa first reported the use of Nd: YAG Laser to perform posterior capsulotomy. It is reported that this procedure although safe is not 100% free of complications. One of the complications is rise of intra ocular pressure (IOP) within the first several hours after YAG capsulotomy. The incidence of significant increase in IOP may be greater than 30%.

In a study by Silverstone the incident of rise in IOP (>5mmHg) in apraclonidine treated group was (7%) which was significantly less than that in placebo group (39%). Other complications reported in the literature are, Endothelial damage, anterior uveitis, Damage to intraocular lens, Rupture of anterior vitreous face, Vitreous hemorrhage, Cystoid macular edema, Macular hemorrhage, Macular hole, and Retinal detachment.

The objective of this study was to compare the efficacy of topical 0.5% timolol vs. 0.5% apraclonidine in the prevention of acute IOP rise following Nd: YAG laser posterior capsulotomy.

SUBJECTS AND METHOD:

This study conducted in ophthalmology department of Liaquat University of Medical & Health Sciences, Jamshoro (Sind) from January to June 2009. 140 patients with uneventful extra capsular cataract extraction with posterior capsulotomy...
chamber intraocular lens and having decreased best corrected visual acuity (BCVA) because of posterior capsular opacity were included in this study. Patients who were not enrolled were the cases with active inflammation or infection, history of complicated surgery, glaucoma, cardiovascular disease, patient receiving systemic clonidine and anti depressant and only eyed patients. The pre laser BCVA was assessed. On slit lamp examination intraocular pressure, anterior and posterior segment findings were recorded in all patients. The purpose and nature of the procedure was explained and informed written consent was taken in all patients. Treatment options were randomly allocated by using sealed envelops and patients were divided into two groups i-e one group treated with 0.5% apraclonidine and other with 0.5% timolol drops instilled one hour before and immediately after laser. The cornea was anaesthetized with topical 0.5% proparacain hydrochloride eye drops and Abraham’s posterior capsulotomy lens used which retracts the lid, stabilizes the eye, magnifies and helps better focusing. The Q-switched Nd: YAG laser (SY 9000 YAG laser system) was used to make hole of 2-3 mm in the posterior capsule by using amount of energy ranging 1-6 milli joules per shot and fewer number of pulses. The intensity and number of YAG laser energy application depends upon type and thickness of capsular opacification. One drop of anti glaucoma drugs (timolol or apraclonidine) instilled immediately after laser and IOP measured immediately after laser and after one hour. Then patients were followed for intraocular pressure measurements and assessment of BCVA after 24 hrs and after one week.

RESULTS:
During January to June 2009, we studied a total of 140 eyes of 140 patients (70 eyes in each group). In Group-A (Apraclonidine group) 37 (53%) were male whereas in Group B (Timolol group) 40 (57%) were males (Table I). All selected eyes were pseudophakic. In group A, 33 (47%) were right eyes and 37 (53%) were left eyes whereas in group B, 35 (50%) were right eyes and 35 (50%) were left eyes (Table I). The age of patients ranged from 16 years to 80 years (Table II). The mean age of the patient in timolol group (53.4 years) was approximately one year higher than that of the apraclonidine group (52.3 years). Although this difference was not statistically significant (table I).

Time interval between cataract surgery and YAG laser capsulotomy was between 6 months to 5 years (Table III). The mean duration in apraclonidine group was 23.5 months and most of the patients (40%) underwent YAG capsulotomy during 25 to 36 months whereas in timolol group mean duration was 20.0 months and 43% of patients underwent YAG capsulotomy during 6 to 12 months (table I and III). All these capsulotomies were performed for optical purpose.

The mean total energy used in apraclonidine group was approximately 147 mj whereas in timolol group was approximately 134 mj. The difference was not statistically significant (table I).

The mean baseline intraocular pressure i.e, before administration of study medications or laser treatment was approximately 14.5 mm Hg, with no significant difference between treatment groups (Table I). The mean Intraocular pressure immediately after laser was 13.70 mm Hg in

<table>
<thead>
<tr>
<th>Table I</th>
<th>Demographic Characteristics of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Apraclonidine Group</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>52±12.1</td>
</tr>
<tr>
<td>Gender</td>
<td>0.062</td>
</tr>
<tr>
<td>Female</td>
<td>33 (47%)</td>
</tr>
<tr>
<td>Male</td>
<td>37 (53%)</td>
</tr>
<tr>
<td>Eyes</td>
<td>0.735</td>
</tr>
<tr>
<td>Right</td>
<td>33 (47%)</td>
</tr>
<tr>
<td>Left</td>
<td>37 (53%)</td>
</tr>
<tr>
<td>Total energy (mj)</td>
<td>147.11 (±64.95)</td>
</tr>
<tr>
<td>Duration (Months)</td>
<td>23.47 (±12.48)</td>
</tr>
<tr>
<td>Baseline IOP Mean (±S.D)</td>
<td>14.61 (2.27)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table II</th>
<th>Age Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (Years)</td>
<td>Apraclonidine Group</td>
</tr>
<tr>
<td>16 – 40</td>
<td>10 (15.0%)</td>
</tr>
<tr>
<td>41 – 50</td>
<td>21 (30.0%)</td>
</tr>
<tr>
<td>51 – 60</td>
<td>23 (33.0%)</td>
</tr>
<tr>
<td>61 – 70</td>
<td>8 (11.0%)</td>
</tr>
<tr>
<td>71 and &gt;</td>
<td>8 (11.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
</tr>
</tbody>
</table>
ap拉克洛尼丁组和14.19mm Hg在普萘洛尔组，一小时后是13.70mm Hg在两个治疗组，一天后是14.56mm Hg在ap拉克洛尼丁组和14.71mm Hg在普萘洛尔组，一周后是14.36mm Hg在ap拉克洛尼丁组和14.60mm Hg在普萘洛尔组。

The mean difference in intraocular pressure between treatment groups at various intervals was not statistically significant. (Table V)

DISCUSSION:

With increasing popularity of ECCE over the recent past, the incidence of posterior capsular opacification is common. The management of posterior capsular opacification attracted a lot of attention. This includes the Nd: YAG laser capsulotomy and surgical dissection. The Nd: YAG laser capsulotomy is the standard treatment of posterior capsule opacification now a days. YAG: Laser is least invasive means of rupturing the posterior capsule. It offers far more safety, eliminates the need for operation and reduces the time required for treatment. Nd: YAG laser capsulotomy is performed as an outdoor procedure and results are immediate and dramatic26, 27. In this study the results of 140 cases of posterior capsulotomy during the period January to June 2009 have been presented.

In our study Nd: YAG laser capsulotomy was performed on all patients who attended with posterior capsular opacification causing decrease in visual acuity. The mean interval between cataract surgery and Nd: YAG laser capsulotomy was 23.47 months (±12.48) in ap拉克洛尼丁组 and 20.20 months (±11.47) in timolol group. The difference was not statistically significant. The earliest capsulotomy was performed 6 months after cataract surgery. The maximum interval between Nd: YAG capsulotomy and cataract extraction was 5 years with no notable difference between treatment groups. Nd: YAG capsulotomy has not been recommended before 3 months of ECCE because during this period posterior capsule shrinks and stretches28. After an interval of more than 3 months it is very easy to perform capsulotomy without disturbing anterior hyaloid face with the result of lower incidence of retinal complication, like cystoid macular edema and retinal detachment29.

We started with laser energy of 1-1.5mj and increased gradually according to the thickness of the capsule up to 3mj. The mean total energy used in ap拉克洛尼丁 group was 147.11mj (±64.95) which was slightly greater than mean total energy used in timolol group i.e, 134.91 (±63.63). But the

<table>
<thead>
<tr>
<th>S.No</th>
<th>Time Interval</th>
<th>Apraclonidine Group</th>
<th>Timolol Group</th>
<th>No. of Eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6-12 Months</td>
<td>20 (29.0%)</td>
<td>30 (43.0%)</td>
<td>50</td>
<td>35.72%</td>
</tr>
<tr>
<td>2</td>
<td>13-24 months</td>
<td>17 (24.0%)</td>
<td>13 (18.5%)</td>
<td>30</td>
<td>21.43%</td>
</tr>
<tr>
<td>3</td>
<td>25-36 months</td>
<td>28 (40.0%)</td>
<td>22 (31.0%)</td>
<td>50</td>
<td>35.72%</td>
</tr>
<tr>
<td>4</td>
<td>37-48 months</td>
<td>2 (3.0%)</td>
<td>4 (6.0%)</td>
<td>6</td>
<td>4.28%</td>
</tr>
<tr>
<td>5</td>
<td>49 or&gt;</td>
<td>3 (4.0%)</td>
<td>1 (1.50%)</td>
<td>4</td>
<td>2.85%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>70</td>
<td>70</td>
<td>140</td>
<td>100 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Energy Used (mj)</th>
<th>Apraclonidine (70)</th>
<th>Timolol (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No: of patients / %age</td>
<td>No: of patients / %age</td>
</tr>
<tr>
<td>45-100</td>
<td>20 (28.57%)</td>
<td>22 (31.43%)</td>
</tr>
<tr>
<td>101-150</td>
<td>22 (31.43%)</td>
<td>23 (32.86%)</td>
</tr>
<tr>
<td>151-200</td>
<td>13 (18.57%)</td>
<td>12 (17.14%)</td>
</tr>
<tr>
<td>201-250</td>
<td>8 (11.43%)</td>
<td>7 (10.0%)</td>
</tr>
<tr>
<td>&gt; 250</td>
<td>7 (10%)</td>
<td>6 (8.57%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (100.0 %)</td>
<td>70 (100.0 %)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Apraclonidine Group Mean (±SD)</th>
<th>Timolol Group Mean (±SD)</th>
<th>Mean Difference</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>14.61(2.27)</td>
<td>14.89(2.07)</td>
<td>-0.27</td>
<td>0.266</td>
</tr>
<tr>
<td>Immediately after YAG</td>
<td>13.70(2.62)</td>
<td>14.19(2.28)</td>
<td>-0.48</td>
<td>0.181</td>
</tr>
<tr>
<td>1 hour</td>
<td>13.76(3.20)</td>
<td>13.70(3.08)</td>
<td>0.06</td>
<td>0.108</td>
</tr>
<tr>
<td>1 day</td>
<td>14.56(2.20)</td>
<td>14.71(2.57)</td>
<td>-0.16</td>
<td>0.279</td>
</tr>
<tr>
<td>1 week</td>
<td>14.36(2.08)</td>
<td>14.60(1.96)</td>
<td>-0.24</td>
<td>0.821</td>
</tr>
</tbody>
</table>
difference was not statistically significant (P value 0.74). The average number of pulse was 25 with no notable difference between treatment groups. Compared to study by Kraff, Saunders and Liberman30 of 118 consecutive Nd: YAG capsulotomies, they reported that the mean energy level used was 1.7mj for both the aphakic and pseudophakic groups. The mean number of pulses required was 24 ± 2 in pseudophakic and 36 ± 8 in aphakic group30. In another study by Slomovic and Parrish15, they used mean pulse energy of 0.8mj (range 0.5-1.5mj per pulse). While the median number of pulses was 92 (range 20-970)35. The energy setting of our study is quite comparable to some other studies. Kang-Sun Wang, Ming-Heng Zhang and Ling Wang32 reported in their study that they used the energy level of 2-4 mj per pulse. The mean total number of pulses required was 154 with a range from 4 to 616. The main objective of our study was to compare the efficacy of 0.5% timolol and 0.5% apraclonidine in the prevention of acute intraocular pressure rise following Nd:YAG laser posterior capsulotomy and we found that apraclonidine 0.5% and timolol 0.5% are equally effective in attenuating the incidence of severity of increase in intraocular pressure after Nd: YAG posterior capsulotomy. Impairment of the outflow facility appears to be the principal mechanism that brings about the transient intraocular pressure increase after Nd: YAG laser capsulotomy34. A decrease in the coefficient of outflow has been documented during the post operative period after Nd: YAG capsulotomy procedure.30-35.

Work in primates suggested that this impairment of outflow was caused by the lodging or accumulation of debris and to development of inflammation in the internal trabecular meshwork, the juxta-canaliccular meshwork or the pores of the internal wall of Schlem’s canal. Posterior capsular remnants have been visualized in the anterior chamber and within the trabecular meshwork after Nd: YAG capsulotomy38. Other factors such as the disruption of the blood aqueous barrier, laser shock wave effects, and the release of unspecified neurohumoral agents may also impair outflow facility and thereby contribute to the post operative increase in intraocular pressure.

The average intraocular pressure before laser, after laser, one hour, one day and one week post-laser in both groups are shown in Table V. There was no statistically significant change between the two groups regarding IOP one hour before, immediately after laser, one hour, one day or one week. There was no statistically significant correlation of IOP with either age, gender or amount of energy used for laser capsulotomy.

Similar results were conveyed through a study conducted by Simsek37 in Turkey, it concluded that even 0.25% apraclonidine is effective in preventing the early elevation of IOP after Nd:YAG laser posterior capsulotomy and may offer an alternative to 0.5%timolol maleate and 1% apraclonidine. An another study conducted by Migliori38 also showed that the mean rise in IOP was significantly less in 0.5% timolol pre treated group one hour after capsulotomy as compared to placebo pre treated group. After four hours, the difference between groups was not significant. There was also no significant difference in pressure responses between eyes treated with six 2mj and three 4mj burst of energy.

A study conducted by Stilma39 in 1986 concluded that timolol 0.5% eye drops given before Nd: YAG laser treatment minimized the elevation of the intraocular pressure. Similar recommendation seen in another study by Yang W40 in China in 1991 that timolol 0.5% should be administered before the YAG capsulotomy in order to reduce side effects caused by higher immediate post capsulotomy pressure rise.

An another study conducted by Pollack41, in which 63 eyes were pre treated with one drop of either 1% apraclonidine or placebo one hour before and immediately after laser treatment. The greatest IOP rise in the placebo treated group occurred i.e, IOP rose from a base line pressure of 16.4±3.7 to 20.8±6.8mm Hg. In apraclonidine treated group, IOP fell from mean of 15.6±3.8 to 12.8±6.0mm Hg three hours postoperatively. It concluded that apraclonidine proved to be highly effective in preventing the rise in IOP following Nd:YAG posterior capsulotomy. Our study also showed fall in IOP from baseline of 14.61±2.27 to 13.76±3.2mm Hg in apraclonidine group and 14.89±2.0 to 13.70±3.08mm Hg in timolol group.

Study conducted by Rosenberg42, to compare the efficacy of 0.5% and 1% apraclonidine in preventing Nd: YAG laser induced intraocular pressure elevation after trabeculoplasty, iridotomy and capsulotomy and it concluded that the single post operative administration of 0.5% apraclonidine is as effective as the 1% concentration in preventing IOP elevation immediately after trabeculoplasty, iridotomy or capsulotomy.

Another locally conducted study by Latif et al 43, showed mean IOP elevation of less than 5mm Hg from baseline in 7(9.3%) eyes in placebo group and 5(6.6%) eyes in apraclonidine group during first 3 hours following Nd:YAG laser posterior capsulotomy. 32% of eyes of placebo group had IOP elevation of 5-10mmHg from baseline as compared to 2(2.6%) of the apraclonidine treated group. It concluded that apraclonidine is effective in preventing IOP elevation following Nd:YAG laser posterior capsulotomy.

Like our study, all above cited international as well as local studies suggested that apraclonidine and timolol are equally effective in attenuating the incidence of severity of increase in IOP after Nd: YAG posterior capsulotomy. Apraclonidine caused higher hypotensive effect after capsulotomy with YAG laser when compared with brimonidine, dorzolamide, latanoprost, pilocarpine and control group.

CONCLUSION:
This study shows that 0.5% apraclonidine and 0.5% timolol 0.5% are equally effective in attenuating the incidence of severity of increase in intraocular pressure after Nd: YAG posterior capsulotomy. There is fall in IOP from baseline of 14.61(±2.27) to 13.76(±3.2) mm Hg in apraclonidine group and 14.89(±2.0) to 13.70(±3.08) mm Hg in timolol group in first hour and pressure return to mean baseline level within a day or a week.

There was no significant correlation of intraocular pressure increase following Nd: YAG laser posterior capsulotomy. Like our study, all above cited international as well as local studies suggested that apraclonidine and timolol are equally effective in attenuating the incidence of severity of increase in IOP after Nd: YAG posterior capsulotomy. Apraclonidine caused higher hypotensive effect after capsulotomy with YAG laser when compared with brimonidine, dorzolamide, latanoprost, pilocarpine and control group.
pressure with age, gender, amount of energy used and duration between cataract surgery and Nd: YAG laser capsulotomy. Since intraocular pressure rise occurs in more than 30% of patients after Nd: YAG laser capsulotomy, it is recommended that prophylactic medications either apraclonidine or timolol should be given to all patients undergoing Nd: YAG capsulotomy especially 1 hour before and immediately after laser. More precautions should be taken in patients with pre-existing glaucoma because IOP elevation is more frequent in these patients. Some patients may require additional glaucoma medications.

REFERENCES:
INTRODUCTION:
Most common cause of epiphora in newly born infants is Congenital Nasolacrimal Duct Obstruction (CNLDO). The incidence rate of CNLDO has been estimated to be from 1.75% to 12.5% infant. It is reported that it resolves by itself in most of the infants but symptomatic CNLDO occurs in 5-6% of newborns. The most important form of CNLDO is caused by persistent layer of lacrimal and nasal epithelial cells at the level of valve Hasner.

The standard method of management is to commence with conservative treatment. The possibility of probing shall be taken into consideration if the conservative treatment fails. Conservative treatment comprises of the use of antibiotic to prevent infection and massage of the sac to use hydrostatic pressure with the hope that CNLDO may get opened. The time for probing has been challenged by controversial derivatives regarding the rate of spontaneous resolution during the first year of life. In case of failure of canalization leading to partial or complete obstruction of duct results into infection of the lacrimal passage proximal to obstruction. This results initially in epiphora with watery discharge leading to sticky and purulent discharge. Initially the conservative management is preferred and the parents are taught to massage the lacrimal sac area along with some topical antibiotic to treat infection until discharge disappears or becomes watery.

The conservative treatment is carried on until spontaneous canalization of NLD to avoid the complications like acute dacryocystitis or canaliculitus or recurrent dacryocystitis leading to obstruction of NLD and surgical intervention. Probing has to be considered when spontaneous canalization of NLD does not occur. The age of infant for surgical intervention should not be less than six months.

MATERIALS & METHOD:
This study was carried out in three years duration from July 2007 to July 2010 including patients from the private sector and the hospital. 135 eyes with congenital nasolacrimal duct obstruction were examined. They were divided in to two groups. Group-I had 62 eyes with age of the patient ranging from 6 months to 12 months and group-II had 73 eyes with age range of the patients from 13 months to 18 months. Probing was done in both groups by upper punctum under short general anesthesia after obtaining informed consent from their parents.

Results: In Group-I probing was successful in 57 (91.9%) patients and in Group-II probing was successful in 63(86.3%) patients.

Conclusion: Probing should be done earlier from 6 months to 12 months of age and should not be delayed.

Key Words: Congenital Nasolacrimal Duct Obstruction (CNLDO) General Anesthesia (GA)
made on clinical grounds i.e. watering, discharge and positive sac regurgitation test. All the patients were prepared for short acting general anesthesia and informed consent was obtained from their parents. Proforma was prepared for follow up. Probing was done through upper punctum in all the patients under short acting general anesthesia. After recovery from GA patients were advised topical antibiotics and weak steroids. They were examined at the end of 1st weak, 1st Month and 2nd month. Topical medications were stopped after 10 days. Those probing were considered successful who were free from discharge, stickiness, epiphora and negative sac regurgitation test.

RESULT:
Probing in the Group-I patients after the end of 2nd months was successful in 57(91.9%) patients and in group-II probing was successful in 63 (86.3%) patients. Table.IV

<table>
<thead>
<tr>
<th>Table I</th>
<th>Eyes Distribution</th>
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<tr>
<td>Unilateral</td>
<td>111</td>
</tr>
<tr>
<td>Bilateral</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total No of Eyes</strong></td>
<td><strong>135</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Table II</th>
<th>Gender Distribution</th>
</tr>
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<tbody>
<tr>
<td>Male</td>
<td>77</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
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</table>

<table>
<thead>
<tr>
<th>Table III</th>
<th>Age Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months to 12 months</td>
<td>62</td>
</tr>
<tr>
<td>13 months to 18 months</td>
<td>73</td>
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</table>

<table>
<thead>
<tr>
<th>Table IV</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>91.9%</td>
</tr>
<tr>
<td>Group II</td>
<td>86.3%</td>
</tr>
</tbody>
</table>

DISCUSSION:
Obstruction of NLD system can occur at any age, but it is particularly a common pediatric problem. It is found in many infants but only 2 to 4% of these become symptomatic. The most common cause of CNLDO is the failure of canalization of the duct at its mucosal entrance (Valve of Hasner) into the inferior meatus. Complete osseous obstruction can also occur especially in association with abnormal passage. Abnormalities with in the nasal passage may also contribute to obstruction of NLD. The infants with CNLDO have variable time of symptoms and signs but in most cases they occur with in first month of birth.

Proper management of CNLDO has controversial approaches. Peterson and Robb study shows that 88% of infants had spontaneous resolutions of their problem with conservative treatment. Based on this they recommend conservative treatment for 6 to 8 months. Crigler recommended digital pressure on the sac to increase hydrostatic pressure in the nasolacrimal sac system causing rupture of membranous obstruction at the lower end of NLD. Paul reported success rate of 87% in patients for a period of 16 months by conservative therapy. Dominique Anel introduced in 1700 AD the concept of probing & irrigation. Yong Sum Kim, Sung-Chur Moon and Kyong Won study shows probing result of 100% in patients under six months and 60% success in patients beyond 6 months of age, so the success rate decreased significantly with the increasing age. H Sarfaraz, ARif M, SM Muhammad. Study shows almost in aggregate 93% success rate by probing. Probing has been a time proved treatment for CNLDO but there is controversy regarding the time of probing.

Those in favor of early probing suggest that early correction avoids months of morbidity due to epiphora and chronic dacryocystitis. They also think that postponement of the procedure may result in decreased success rate because of chronic inflammation and fibrosis. Those who are in favour of delayed probing comment on large number of infants in which spontaneous resolution of obstruction negates the need for probing at the first place because of spontaneous resolution. Rajat Maheshwari study reveals 88.1% result in patients of age between 1 to 2 years and success rate decreased to 80.9% after two years of age. A.D Syed Khan Zada M.A, Jatoi SM Study shows 93.3% success rate under 1 year and 84.4% success rate beyond one year which is comparable to our study. Havins & Willkins demonstrated success rate of 94% for probing at 8 months of age and 56% success rate in patients at 18 months of age. The study of our Group-I has similar result as mentioned. Study of Stagir shows 92.4% success rate of probing in the first 12 months of age which is comparable to our study. Katowitz JA & Welsh documents 95.9% result of probing at an early age. Wobring & Fook recommended early probing of NLD system after only one to two weeks of topical therapy with antibiotic.

Basel T, Baarah MD, Wael Abu Laban MD study reveals success rate of probing in 94.1% of patients of age 6 to 12 months, 79.6% success rate in patients from 12 to 18 months, hence early probing has good result as compared to late probing.

CONCLUSION:
Summarizing the results of multiple national and international studies it is evident that probing under 12 months of age has good success rate compared to probing beyond 12 months of age. Moreover the success rate is decreasing with the increasing age. Therefore, it is recommended that probing should be done at the age of 6 months to 12 months, if chances of spontaneous resolution are minimal.

REFERENCES:
1. Lee SY, Chung HS, Kim HB, Namgung R, Han DG. The incidence of congenital nasolacrimal duct obstruction in Korean neonates.


24. Havins HE, Wilkins RB. A useful alternative to silicone intubation in congenital nasolacrimal duct obstruction.


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**How to take Amniotic Membrane†**

Chorion is all vascular and you just have to use your pulp of fingers to separate the thin transparent (slightly dirty white) amniotic membrane from chorion. Once the cleavage is defined, it will easily be separated and clots can be washed thoroughly.

†**How to Sterilize and Prepare Amniotic Membrane for Grafting**

We take amniotic membrane from planned C-section cases who have been screened for HIV, Syphils& Hepatitis. The placenta is washed in a balanced salt solution (BSS) to remove clots and debris. The amnion is separated from chorion by blunt dissection (it is not so difficult) and washed with BSS containing 50 mg/ml penicillin, 50 µg/ml streptomycin, 100 mg/ml of neomycin as well as 2.5 mg/ml of amphotericin -B thoroughly one by one and we place it on sofra-tulle paper with epithelial side up (smooth surface). It can be stored at -20 degrees in regular deep freezers for 1 month safely if you have > 80 degrees storage then it can be stored in 50-85% glycerol to be used for 1 year.

**REFERENCE:**


3. Dr Munira Shakir’s FCPS thesis from the College of Phys. & Surgeons, Pakistan

(Courtesy: Dr Munira Shahzad, Online)

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**Karophth 2011**

11, 12 & 13th Feb. 2011

at

**Pearl Continental Hotel**

**Karachi**

For Details Please Contact:

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Hyphaema due to Closed Globe Injury (CGI): Presentation & Treatment Modalities

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ABSTRACT

Objectives: To study the causes, clinical presentation and treatment modalities of hyphaema following closed globe injury in hospitalized patients.

Study design: A descriptive case series.

Place & duration of study: The study was carried out at Department of Clinical Ophthalmology, Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Postgraduate Medical Institute (PGMI), Hayatabad Medical Complex (HMC), Peshawar from 1st March 2009 to 30th July 2010.

Patients and methods: A retrospective analysis of record of all cases of traumatic hyphaema who were admitted during the study period was carried out. Through history points and clinical findings of the patients were recorded in a predesigned comprehensive proforma. Clinical presentation including visual acuity, intraocular pressure, findings after slit lamp and fundus examination were noted. Various treatment options adopted were also noted.

Results: In this study, we evaluated 41 eyes of 41 patients, who presented with traumatic hyphaema due to blunt trauma and were admitted in our unit from 1st March 2009 to 30th July 2010. There were 37 (90.2%) male and 4 (9.8%) female. 17 cases (41.5%) presented on first day, while 17 cases (41.5%) presented after 3 days (Range>3-30days). Fifteen cases (36.6%) had trauma with stone which was the most common agent. Visual acuity at presentation was perception of light (PL+) with good projection of light in all quadrants in 15 cases (36.6%), less than 3/60 in 12 cases (29.3%), 3/60-6/60 in 8 cases (19.5%) and better than 6/60 in 6 (14.6%) cases. Twenty four eyes (58.5%) had IOP of more than 21 mm of Hg while 17 cases (41.6%) had IOP less than 21 mm of Hg. All the patients received conservative approach and were treated medically (steroids and cycloplegics) and 24 cases (58.5%) in which IOP was raised received IOP lowering medication. Surgical intervention in the form of anterior chamber wash was done in 15 cases (36.6%).

Conclusions: Traumatic hyphaema is more common in children. (Grade-I hyphaema is more common). Most common traumatic agent is stone followed by stick. Almost 3/5 of the cases are associated with elevated IOP. Lens related problem and corneal haze are the important co-morbidities. Surgical intervention is required in those in which IOP is not controlled medically.

Key words: Traumatic hyphaema; Closed globe injury; Hyphaema.

INTRODUCTION

The eyes are the third most common organs affected by injuries, next to the hands and feet although they represent only 0.27% of the total body area and 4% of the total facial area. Eye injuries still remain one of the most common cause of unilateral blindness worldwide. Blunt eye injuries mostly result in hyphaema and are not an infrequent cause of presentation to the emergency units of many eye clinics.2-8 Although eye injuries are a major public health problem globally, most studies have been done in developed countries.3,5,7 Reports from developed countries suggest that severe eye injuries take place during work and leisure,3,5,7 but reports from developing countries are different.6,8 Besides, globally changing lifestyles and socioeconomic circumstances might have changing effects on the patterns of blunt eye injuries.

Traumatic hyphaema is regarded as a sign of ocular trauma and may require admission to hospital. It is usually associated with damage to the anterior segment and frequent damage to the posterior segment structures. Hospital treatment aims at promoting resolution of the anterior chamber clot, prevention of secondary haemorrhage and associated complications, with identification and treatment of any posterior segment injuries. Secondary haemorrhage has come to be considered the single most important complication of traumatic hyphaema and in recent years a wealth of literature from North America and Scandinavia has been produced as attempts have been made to prevent its occurrence.1 Considerable differences of opinion exist about its management. Some suggested forms of treatment include miotics, mydriatics cycloplegics, topical and systemic corticosteroids alone or in various combinations. Sedation with complete bed rest with unilateral, bilateral or no patching of the eyes. Use of such medications as acetazolamide, mannitol, topical B-blockers when the intraocular pressure is raised.9,13

This study was undertaken to provide information on the clinical and demographic data of patients admitted with hyphaema in eyes which received closed globe injury (CGI) at eye unit of Khyber institute of ophthalmic and medical sciences (KIOMS), Hayatabad Medical Complex (HMC), Peshawar.
**MATERIAL & METHODS**

This retrospective study was conducted by reviewing the record of patients with a diagnosis of hyphaema after closed globe injury who were admitted in our unit during the period of one year and six months (1st March 2009 to 30th July 2010). Data was collected with the help of predesigned proforma. This proforma included complete history regarding the age, sex, time since injury, place of injury and traumatic agent. Clinical data obtained included grading of hyphaema, slit lamp microscopy, intraocular pressure, direct and indirect ophthalmoscopy. Level of hyphaema was graded as Grade 1 (hyphaema filling less than one third of the anterior chamber); grade 2, (hyphaema filling one third to one half of the AC); grade 3, (hyphaema filling more than half of the AC, but less than the total), and grade 4, (total hyphaema with either red or black blood clots). All patients were treated according to the standard eye department protocol for traumatic hyphaema. The standard practice of management during this period of study was to admit all patients with traumatic hyphaema, restrict activities, give topical cycloplegics and topical steroids. Eyes with raised intraocular pressure were treated with topical and systemic intraocular-pressure-lowering agents. Surgical evacuation of blood (anterior chamber wash) was performed on all eyes with black ball hyphaema, eyes with signs of corneal blood staining and those with uncontrolled intraocular pressure with medication. Subjects with penetrating eye injuries and non-traumatic hyphaema were excluded from the study. Statistical analysis was performed using the SPSS program, and simple proportions to report the findings.

**RESULTS:**

In this study, we evaluated 41 eyes of 41 patients with Closed Globe Injury who presented with hyphaema and were admitted to our unit during the study period from 1st March 2009 to 30th July 2010. There were 37 (90.2%) male and 4 (9.8%) were female. Age distribution is shown in Figure -I. Right eye was involved in 21 (51.2%) cases while left eye in 20 (48.8%) cases. Seventeen cases (41.5%) presented on first day, 2 cases (4.9%) on second day, 5 cases (12.2%) on third day while 17 cases (41.5%) presented after 3rd day (range>3-30days). Place of injury is given in Table -I. 15 cases (36.6%) had trauma with stone, 10 cases (24.4%) with stick, 3 cases (7.3%) with tennis ball, 3 cases (7.3%) with rope, 2 cases (4.9%) with toy pistol while 8 cases (19.5%) with various other agents. Grading of hyphaema at presentation is shown in Table II. Visual acuity at presentation was perception of light (PL+) in 15 cases (36.6%), in the range of hand movement (HM) and less than 3/60 in 12 cases (29.3%), 3/60-6/60 in 8 cases (19.5%) and better than 6/60 in 6 cases (17.1%). Twenty four cases (58.5%) had IOP more than 21 mm of Hg while 17 cases (41.6%) had less than 21 mm of Hg. All the patients initially received conservative approach and were treated medically (steroids and cycloplegics). Subjects with penetrating eye injuries and non-traumatic hyphaema were excluded from the study. Surgical intervention in the form of anterior chamber wash was done in 15 cases (36.6%). Co morbidities at the time of discharge are given in Table -III.

**DISCUSSION:**

There were 37(90.2%) male and 4(9.8%) female in our study, which is similar to reports from Western Europe, America, Asia and Africa. The male preponderance reported in Europe and North America varied. The male to female ratio of patients with traumatic hyphaema in 184 cases who were over 30 years of age as reported by Edwards and Layden, was 3.1:1. Agapitos et al had reported a male to female ratio of 3.6:1 among children with hyphaema. Another national study by Jan et al in Pakistan reported male to female ratio of 8:1, and among Polish children, the
reported ratio was 4.3:1. In our study 73.2% cases had age less than 18 years. The majority of the patients in a study by Amoni were 20 years old or younger. Right eye was involved in 21 (51.2%) cases while left eye in 20 (48.8%) cases in our study. The left eye was more commonly involved than the right in a study by Adeyinka O. Ashaye. This may be a reflection of the fact that majority of individuals are right-handed. Missiles or sticks used with the right hand were more likely to affect the left eye. In our study seventeen cases (41.5%) presented on first day. Of 899 patients with an eye injury reported by Mela et al., 84% presented within 24 hours of injury or the day after the injury. Of 109 patients by Darr and Passmore, 104 were seen in first 12 hours of injury. All the patients in a Oksala’s study reported within first 24 hours. In our study less number of patients presented on first day compared to other studies. This is probably due to inadequate awareness, poverty and unavailability of primary eye care facilities. Most patients needed to travel for long distance to access the appropriate eye care facility. In our study 63.4% injuries were sports related. According to Adeyinka O. Ashaye, home and school were the two most common locations for serious eye injuries that result in hyphaema, accounting for two-third of the places where these injuries took place. This was the case particularly in children and adolescents. Several other authors have similarly identified the home as the most common location for all types of injury, the reason may be the amount of time spent at home. Others have reported work and sports places to be common locations for eye injuries. In the adults, hyphaema-inducing injuries result from different causes. In the study of McEwen, 69.9% of injuries were work-related, while 18.3% were sports-related. Tools and machinery either at home or the workplace were the agents of eye injuries in the study by Baker et al. In our study, stone was the most common agent i.e in 15 cases (36.6%) followed by stick in 10 cases (24.4%). According to Adeyinka O. Ashaye, in developed countries, toys are a common cause of eye injuries. Most common traumatic agent is stone followed by stick. About 2/3 of the cases are associated with elevated IOP. Lens related problem and corneal haze are the important co-morbidities. Surgical intervention is required in those in which IOP is not controlled medically.

REFERENCES:
Phacocele / Lenticule Subconjunctival Dislocation of the Lens

Dislocation of the crystalline lens in the subconjunctival or subtenon space has been termed as phacocele or lenticele and it has been seen in healthy individuals after blunt trauma resulting in indirect scleral rupture. Lam and Garg described a case who had these findings after sustaining blunt trauma from a metal bar while Sony et al had a case which developed it after trauma with own finger. Similar cases have been reported by others. Bhattacharjee et al presented eight, Yurdakul et al five, Emarah et al, and Santos-Bueso et al one case each. Intraocular lens dislocation in the subconjunctival area after trauma has also been reported by Motolese et al and Kumar et al. A minor ocular trauma can cause globe rupture and traumatic subconjunctival dislocation of lens in Ehlers-Danlos Syndrome. Corneal perforation and lens extrusion has been observed in cystic fibrosis. Surgical sclera inspection is essential in such cases.

Zonular support of the lens is damaged by trauma to a variable degree. Phacodonesis can result from elastic cord-related injury. Subluxation of lens has occurred from tennis ball-related injuries, from ice hockey and in Smith-Magenis syndrome etc. Lens dislocation due to injury has been reported, anterior by water splash, posterior by different types of injuries.

Eye rupture due to trauma may occur in patients who have undergone ocular surgery, suffer from an underlying predisposing condition of the eye and rarely even in healthy persons. Wound dehiscence after penetrating keratoplasty resulting from trauma has been seen mostly after falls in the elderly population. In some cases, the interval was 11 - 12 years. Eze et al found road traffic accidents followed by assaults and gunshot injuries to be the commonest cause of traumatic ocular injury affecting the globe. Khan BS and Khan MD studied acquired ectopia lentis cases and the commonest causes of trauma were stone in 34.5%, iron piece in 10.3%, wood piece in 8.6%, slap on the face in 6.9% and 5.2% cases each of bomb blast, sports ball injury and coughing. Ultrasound and CT have been used to evaluate such eyes.

Courtesy: Prof. Syed Imtiaz Ali Shah, Dean Faculty of Sciences, SBB Medical University, Larkana, Online
Various Clinical Presentations of Vernal Kerato-Conjunctivitis (VKC)

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ABSTRACT

Purpose: The purpose of this study was to identify the various clinical presentations of vernal keratoconjunctivitis in different age and sex groups and seasonal variation.

Material & Methods: 100 patients of vernal keratoconjunctivitis who visited to eye OPD, Lady Reading Hospital, Peshawar from January 2010 to June 2010 were selected for study and interviewed through a structured questionnaire.

Results: This study included 100 cases of vernal keratoconjunctivitis, out of which 80% patients were male and 20% were female. 46% patients belonged to the age group of 6-10 years and 27% belonged to the age group of 11-15 years. Regarding symptoms, 94% had redness, 90% had watering, 91% had photophobia, 48% had foreign body sensation and 64% had thick discharge, while 44% were having dimness of vision. It was observed that 90% of the patients had seasonal variation while 10% had a perennial course. Regarding signs, 30% were having papillary hypertrophy, 23% had cobblestone appearance and 25% were having only papillae. Simple allergic response such as follicles were seen in 91% of the patients. Regarding the corneal complications, the commonest was superficial punctate keratitis seen in 37%.

Conclusion: VKC is fairly a common disease of young males with seasonal variation. It has lot of complications which need to be diagnosed and managed properly in time to avoid marked visual impairment.

Keywords: vernal keratoconjunctivitis, spring catarrh

INTRODUCTION

Vernal Keratoconjunctivitis (VKC) is a recurrent bilateral, allergic inflammation of conjunctiva and cornea characterized by intermittent seasonal exacerbation. It is an acute type-I immediate hypersensitivity response that may develop within minutes after exposure to the allergens. Dissolution of the airborne antigen in tear film facilitates its passage across the conjunctiva where immunoglobulin E (IgE) binding occurs at the surface of mast cells with subsequent release of histamine. VKC mostly affects young boys between 5-20 years with a self limiting course. It starts resolving around puberty; and it rarely persist beyond the age of 25 years. Affected patients may be allergic to airborne allergens like pollens, mites, molds, and animal dandruff. There are three main clinical types: Palpebral, Limbal and Mixed. Although VKC has long been considered as an atopic disease, it is suggested that more than one immune mechanism might be involved in the origin of the disease. Superficial punctate keratitis was found to be the most common corneal complication of vernal catarrh. Main causes of decreased vision were keratoconus, shield ulcer, corneal plaques and acute hydrops. Poverty, overcrowding and poor hygienic conditions may be contributing factors for vernal keratopathy. Visual morbidity is mostly due to the corneal complications of the disease.

VKC is more common in this part of the world and this affects the children and young adults in the age group which is most important period of life regarding education and future career planning. This study was conducted at the Ophthalmology Department of Khyber Institute of Ophthalmic Medical Sciences, Lady Reading Peshawar and mainly included clinical presentation, seasonal variation and complications of VKC. Vernal catarrh or vernal kerato-conjunctivitis is a bilateral recurrent hypersensitivity reaction that occurs during the warm months of the year particularly in the hot climates rather than cold climates. It is usually seasonal and tends to recur in the months of May and June. In tropical climates VKC tends to be perennial. Vernal catarrh has an important hereditary predisposition as well, but the exogenous factors such as climate, season and allergen exposure determine the likelihood and severity of the disease. Vernal catarrh is self limiting disease and resolve around the age of 20-25 years. Young males are affected more commonly than female. Poverty, overcrowding and poor hygienic conditions are contributing factors. VKC occurs predominately in the warm climate of the Middle East, the Mediterranean and part of the South America.

MATERIAL AND METHODS

This is a descriptive observational study conducted in the OPD of the Ophthalmology unit of Khyber Institute of Ophthalmic Medical Sciences Lady Reading Hospital Peshawar during the period of January 2010 to June 2010. Informed consents were obtained form all participants before entry into the study. Patients of other allergic conjunctivitis were excluded from the study. History and examination was focused on symptoms as itching, photophobia, watering and dimness of vision and on the various clinical presentation...
of VKC in different age groups as well as the other characteristics (age, sex and socioeconomic condition) of the patients presented with VKC. The data collected included the effects of different seasons/environment regarding the severity of the disease.

A separate proforma was filled for every patient. Examination included visual acuity checking and slit lamp examination of the anterior segment including the lids, conjunctiva for hypertrophy, papillae and Trantas dots, corneal examination for superficial punctate keratitis, shield ulcer, keratoconus and opacities. Fundus examination and intraocular pressure check up were done according to the need. After the data collection, data was tabulated and analyzed through frequencies and percentages and presented in tabulated forms.

RESULTS

This study included 100 cases of vernal keratoconjunctivitis out of which 80 (80%) patients were males and 20 (20%) patients were females. Forty six patients (46%) belonged to age group 6-10 years and 27 patients (27%) belonged to age group 11-15 years. Age group 16-20 were having 13 patients (13%) while age group 0-5 and above 20 years were having 7 patients (7%) each. During the study it was observed that most of the patients belonged to rural areas. Nine patients (9%) had a monthly (family) income of less than Rs. 2000, 69 patients (69%) were having monthly income between Rs. 2000-5000, 15 patients (15%) had income or Rs. 5001-10000. Seventy nine patients (79%) were living in slum, 6 patients (6%) were living in posh localities whereas 15 patients (15%) were living in the two. Seventy-one patients (71%) were living in muddy (kacha) houses, 17 patient (17%) were living in partially cemented house whereas 12 patient (12%) were living in cemented (Pacca) houses. Study showed that 5 patients (5%) had less than 7 family members 51 (51%) had 7-12 family members and 19 patients (19%) had 13-20 family members while 25 patients (25%) had more then 20 family members living in a house. At the time of presentation it was disclosed that all the patients (100%) were having itching, 94 patients (94%) complained of redness while 90 patients (90%) complained of watering, 91 patients (91%) had photophobia and 48 patients (48%) had foreign body sensation. Forty-four patients (44%) were having dimness of vision and 64 patients (64%) complained of thick discharge form eye Table:1. In this study 90 (90%) of the patients had seasonal variations while 10 (10%) had perennial course with no seasonal variations Figure: 1. On the basis of history, 75 patients (75%) had exacerbations in the spring season i.e. form March to May, 16 patients (16%) had experienced exacerbations from June to August and 7 patients (7%) from December to February while 2 patients (2%) were reported in a period from September to November. Most of the patients were seen with decreased vision due to corneal involvement. Thirty four patients (34%) were having good vision form 6/6 to 6/12. Twenty seven patients (27%) were having visual acuity between 6/60 and 3/60. 14 patients i.e. (14%) having VA 3/60. However visual acuity could not be recorded in 21 patients (21%) either due to low I.Q, lack of cooperation or severe distress, Table: 2. Eyelid signs indicated that 34 patients (34%)were having normal eyelids. Most common eyelid sign was pseudo-ptosis present in 20 patients (20%) followed by crusts seen in 19 patients (19%). Blepharitis and blepharospasm was seen in 18 patients (18%) and 13 patients (13%) respectively and six patients (6%) had swollen eyelids. Regarding the limbal signs 19 (19%) patients had a normal limbus. 12 patients (12%) were seen in the case of hypertrophic condition. Limbitis was seen in 38 patients (38%). Trantas dots were seen in 11 patients (11%) whereas 20 patients (20%) showed the presence of discoloration. Table: 2. During the study, the most common corneal complication seen in 37 patients (37%) was superficial punctate keratitis, followed by ulcer which was seen in 17 patients (17%). 4 patients (4%) had keratitis while 5 patients (5%) suffered from plaque. Pseudogerontoxon and keratoconus was present in 6 patients (6%) and 16 patients (16%) respectively. The corneal opacification was seen in 11 patients (11%) whereas acute hydrops in 4 patients (4%). Table: 2.

TABLE-1:

<table>
<thead>
<tr>
<th>Type of Symptoms</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Redness</td>
<td>94</td>
<td>94%</td>
</tr>
<tr>
<td>Watering</td>
<td>90</td>
<td>90%</td>
</tr>
<tr>
<td>Photophobia</td>
<td>91</td>
<td>91%</td>
</tr>
<tr>
<td>Foreign Body Sensation</td>
<td>48</td>
<td>48%</td>
</tr>
<tr>
<td>D.V</td>
<td>44</td>
<td>44%</td>
</tr>
<tr>
<td>Discharge</td>
<td>64</td>
<td>64%</td>
</tr>
</tbody>
</table>

DISCUSSION

Spring catarrh is an allergic recurrent bilateral interstitial inflammation of the conjunctiva with a period of seasonal variation and exacerbation in the spring and remission in the winter. This study include 100 cases of vernal keratoconjunctivitis (VKC). We examined the patients and observed the various clinical manifestation which include 80% male and 20% female. Male presentation has been reported by many authors. Most of the patients i.e. 46% were in between the age group of 6-10 years which is also reported by Kanski JF. Monthly income of 69% patients
were in between 2000-5000 which shows that this disease was more common in poor population. Seventy-nine percent of them were living in slum, 15% in mediocre and 6% in posh areas. Most of them i.e. 59% were living in small houses having 1-3 rooms. Study also shows that disease was more common in families having family members of 7-12. (57%). Simply we can explain that the vernal keratoconjunctivitis is more common in younger age group having poor socioeconomic conditions. This also evident by the study of Anthony Hall 4 and Lambias et al. 10 One of the most important aspect of this study is that 90% of the patients have seasonal variation while only 10% are season free. This observation is in agreement with Khan MD et al11 who had also reported seasonal variation and is in disagreement with Becerril Angeles M et al2. The perennial nature of the disease was also supported by Lambias et al 10.

According to this study the disease was common (75%) in between March of March to May while it was less common 21% in between September to November regarding the symptoms again with agreement Khan MD et al. 11. An association of atopic diseases and VKC has been reported by many authors 2,7,8 although more that an immune mechanism may be involved in the origin of disease3. In this study 34% of the patients were having good visual acuity ranging form 6 /6-6/12 27% patients having visual acuity of 6/18-6/36 while only 4% of the patients had visual acuity of 6/6 to CF-3 meter. One of most important aspect of my study was to document the various clinical presentation of vernal catarrh in 34% of the patients eyelids were normal 18% had crest 13% had blepharospasm while only 6% had swollen eyelids which is reported by Marbach PM et al. The hallmark of the disease was the presence of giant papillae (cobblestone appearance) at the upper tarsal conjunctiva in the fornices or at limbus. This observation is in agreement with Khan MD et al11 and Marbach PM. The papillae have characteristic finding in 38% of the patients there was limbitis 20% have discoloration of the limbus 12% have hypotrophic appearance at the limbus 11 have trantas dots while 19% were having normal limbus, this was observed by Lambias A et al.10

In this study, 37% of the patients were having superficial punctate keratitis (SPK), 17% had ulcer, 11% had corneal opacification, 16% had keratoconus, 6% had Pseudogerontoxon, 5% had corneal plaque and 4% presented with keratitis and acute hydrops. The corneal complication observed by Khan MD et al11 and Bonini S et al12 was the same as in our study.

**CONCLUSION**

Vernal keratoconjunctivitis is very common presentation in practice of ophthalmology in this area of study. Young males are more affected than females. Seasonal exacerbation of the disease was experienced in 90% of the patients. Poverty overcrowding and poor hygienic conditions are the contributing factors. Continuous research for new drugs for the treatment of VKC that are safe effective and steroid sparing is highly desirable.

**REFERENCES**


**TABLE-2: Clinical Signs (N=100)**

<table>
<thead>
<tr>
<th>Conjunctival Signs</th>
<th>%</th>
<th>Corneal Signs</th>
<th>%</th>
<th>Visual Acuity</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Allergic Response</td>
<td>9%</td>
<td>S.P.K</td>
<td>37%</td>
<td>6/6-6/12</td>
<td>34%</td>
</tr>
<tr>
<td>Papillae</td>
<td>25%</td>
<td>Keratitis</td>
<td>4%</td>
<td>6/18-6/36</td>
<td>27%</td>
</tr>
<tr>
<td>Follices</td>
<td>7%</td>
<td>Plaque</td>
<td>5%</td>
<td>6/60-CF 3m</td>
<td>4%</td>
</tr>
<tr>
<td>Cobble Stones</td>
<td>23%</td>
<td>Ulcer</td>
<td>17%</td>
<td>&lt;CF 3m</td>
<td>14%</td>
</tr>
<tr>
<td>Simple Papillary Hypertophy</td>
<td>30%</td>
<td>Pseudogerontoxon</td>
<td>6%</td>
<td>Could not be recorded</td>
<td>21%</td>
</tr>
<tr>
<td>Naevus</td>
<td>6%</td>
<td>Keratoconus</td>
<td>16%</td>
<td>Total</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>Acute Hydrops</td>
<td>4%</td>
<td>Opacification</td>
<td>11%</td>
</tr>
</tbody>
</table>
Evaluation of the Efficacy of Diclofenac Sodium Eye Drops in patients undergone Cataract Surgery

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Medical Officer, Lady Reading Hospital, Peshawar

ABSTRACT

Purpose: The purpose of this study was to evaluate the efficacy of topical diclofenac sodium 0.1% in patients undergone cataract surgery. Efficacy was measured in terms of control of post operative inflammation.

Material and Methods: 150 patients were enrolled for this study. They were administered topical diclofenac sodium eye drops after 7 days of topical steroid use. Baseline inflammatory flare and cells in the anterior chamber was evaluated by slitlamp examination. Follow up assessment were carried out on 1st, 2nd, 4th and after 6th week.

Results: Postoperative evaluation after 2 weeks showed that one out of total 150 patients had developed iris prolapse, 117 (78%) patients showed +1 reaction, 26 patients (79.3%) had +2 reaction and had conjunctival congestion only one patient had severe reaction necessitating steroid use and five patients did not come for follow up. After 4 weeks, 132 patients (92.30%) were showing no anterior chamber reaction and were comfortable. 11 patients (7.6%) showed +1 anterior chamber reaction. Last follow up visit revealed that all patients were showing no anterior chamber reaction and all were comfortable.

Conclusion: Postoperative inflammation following cataract surgery can be better controlled with topical diclofenac sodium 0.1% eye drops avoiding complications resulting from prolonged use of topical steroids.

INTRODUCTION

Inflammation following ocular surgeries especially cataract surgery can leads to severe complications like anterior capsular opacification, posterior capsular opacification, inflammatory glaucoma, pupil block glaucoma, cyclitic membrane formation and even Cystoid macular edema due to prostaglandins release during inflammation. This inflammation has to be restricted and for control of this inflammation topical steroids are most commonly used. Topical steroids successfully restrict this postoperative inflammation. In our setup topical steroids are used for long time ranging from 40 to 60 days. This prolonged use of topical steroids by itself can leads to various complications like delayed wound healing, reactivation of ocular infection like viral and tuberculosis, steroids induced glaucoma especially in moderate and high steroid responders like people with primary open angle glaucoma and their siblings who have 30% risk and their offspring who have 25% risk of developing steroid induced glaucoma. Postoperative topical steroids also adversely affect blood glucose level more in diabetics then non diabetics. To limit inflammation and its complications and avoid complications due to prolonged steroid use non steroidal anti inflammatory drugs are good alternatives especially Diclofenac sodium eye drops. Topical diclofenac sodium can successfully control inflammation and its complications like inflammatory glaucoma, lenticular capsular opacification and even Cystoid macular edema. The aim of this study is to evaluate the efficacy of topical diclofenac sodium eye drops in patients who have undergone cataract surgery.

MATERIAL AND METHODS

Patients undergone cataract surgery in eye department of District Head Quarter Hospital Battagram from April 2010 to September 2010 who were fulfilling inclusion criteria were put on topical diclofenac sodium 0.1% eye drops after initial course of topical dexamethasone 0.1% eye drops for one week

Inclusion criteria:

i. Patients over the age of 30 years
ii. ECCE-PC IOL – uncomplicated

Exclusion criteria:

i. Patients having marked or severe anterior chamber reaction after a week of topical dexamethasone use.
ii. Intraocular pressure > 22 mmHg preoperatively.
iii. Eyes receiving other medications preoperatively.
iv. Previous ocular surgery
v. Pseudoexfoliation
vi. Diabetic retinopathy
vii. Allergic to diclofenac sodium
viii. One eyed individuals
ix. Patients who have developed intraoperative or postoperative complications with in 7 days of surgery

Patients admitted through OPD underwent a detailed slitlamp examination, measurement of intraocular pressure (Goldman) and assessment of Snellen visual acuity. The ocular surgery was a standard ECCE and PC IOL implantation. Initially all patients were put on topical dexamethasone 0.1% + tobramycin eye drops for one week. Seven patients were withdrawn from the study for following reasons:

- One patient developed wound gape with iris prolapsed
- One had severe reaction necessitating use of steroids
- Five were irregular for follow up.

Patients were examined after 1, 2, 4, and 6 weeks of postoperative period.

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E.Mail: Dr. Ihsan Ullah <dihsanullah_2002@yahoo.com>
surgery, and were graded on the following aspects:
I. Anterior chamber cells were graded as
   +1 5-10 cells (mild)
   +2 11-20 cells (moderate)
   +3 21-50 cells (marked)
   +4 >50 cells (severe)
II. Aqueous flare in anterior chamber was graded as
   +1 just detectable (faint)
   +2 Iris details clear (moderate)
   +3 Iris details hazy (marked)
   +4 Severe fibrinous exudates (severe)
III. conjunctival congestion.

RESULTS
On 1st postoperative day patients were examined and were put on topical dexamethasone + tobramycin eye drops. On 1st follow up visit after 7 days patients fulfilling inclusion criteria were put on topical diclofenac sodium 0.1% eye drops. Topical antibiotic tobramycin was stopped.

Postoperative evaluation after 14 days showed that 01 out of total 150 patients had developed iris prolapse, 117 (78%) patients showed +1 reaction, 26 patients (17.3%) had +2 reaction and had conjunctival congestion and only 01 patient had severe reaction necessitating steroid use and 05 patients did not come for follow up. (Table No: 1)

Post operative evaluation after 28 days showed that 132 patients (92.30%) had no anterior chamber reaction and were comfortable. 11 patients (7.6%) showed +1 anterior chamber reaction and conjunctival congestion and punctuate epithelial erosion. These patients with punctuate epithelial erosion were put on topical hydroxyl propyl methyl cellulose eye drops. (Table No: 2)

Last follow up visit after 42 days revealed that all patients were showing no anterior chamber reaction and all were comfortable.

Table No: 1. Results on 14th postoperative day

<table>
<thead>
<tr>
<th>Grade of inflammation</th>
<th>Number of cases</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>117</td>
<td>78%</td>
</tr>
<tr>
<td>Moderate</td>
<td>26</td>
<td>17.3%</td>
</tr>
<tr>
<td>Severe</td>
<td>01</td>
<td>0.67%</td>
</tr>
</tbody>
</table>

Table No: 2. Results on 28th postoperative day

<table>
<thead>
<tr>
<th>Grade of inflammation</th>
<th>Number of cases</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>No inflammation</td>
<td>132</td>
<td>92.3%</td>
</tr>
<tr>
<td>Mild</td>
<td>11</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

DISCUSSION
Cataract surgery is the most commonly performed ocular surgery. Cataract surgery definitely results in inflammation in the anterior chamber. This inflammation can be mild, moderate, marked or severe. Factors responsible for this inflammation are type of surgery i.e. surgery with more ocular manipulation like conventional ECCE, manipulation of the iris, prolonged surgical time, toxic reaction to irrigation fluids, retained lens matter or even to the intraocular lens implanted. Depending upon the severity of inflammation various complications can results like acute raise of intraocular pressure due to trabeculitis or pupil block, anterior capsular opacification, posterior capsular opacification and even cystoid macular edema.

Topical steroids are in common use for limitation of this inflammation but topical steroids can result in various complications like delayed wound healing, reactivation of ocular infection, steroid induced glaucoma and even it can interferes blood glucose level in diabetics.

Steroid induced glaucoma is the major concern especially in patients with primary open angle glaucoma and their siblings and offsprings who are moderate steroid responders. Sehota and colleagues has studied occurrence of steroid induced glaucoma in patients who are steroids responders.

To avoid complications due steroids use, topical diclofenac sodium eye drops is the better alternative. It not only limits inflammation but also avoids complications due to steroid use. Topical diclofenac sodium has comparable anti-inflammatory activity to topical steroids. Rositte and Miyaka has studied that topical diclofenac sodium eye drops is also more effective in prevention of cystoid macular edema as it has more good effect on choroidal blood flow.

Herbert and Jauch has studied effect of topical diclofenac sodium eye drops on corneal epithelial cells and has found that in high doses, diclofenac sodium can result in punctuate epithelial erosion resulting from matrix metalloprotinases release but this complication can be prevented by use in not too frequent doses. Quantitative assessment have been carried out through flurophotometry proving the effectiveness of NSAIDS in reducing the break down of blood aqueous barrier and diclofenac have been shown to be as effective as steroids in nonimmunogenic traumatic inflammation such as postoperative inflammation thus making it a good alternative to steroids in cataract surgery.

CONCLUSION
Post operative inflammation following cataract surgery can be better controlled with topical diclofenac sodium 0.1% eye drops by avoiding complications resulting from prolonged use of topical steroids.

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Pakistan Glaucoma Association
President’s Message
It is indeed a matter of great pleasure to introduce Pakistan Glaucoma Association. The objective of the Association shall be the promotion of awareness, education, research, and patient care, particularly with regard to current and advancing concepts in glaucoma management.

It will be the effort of Pakistan Glaucoma Association (PGA) to keep the Medical profession and public at large informed about the latest in relation to Glaucoma through print and electronic media. These activities of the association are additionally aimed at pooling human resources and capacity building on a national level.

The association will keep close interaction with all the international groups with similar objectives especially those working in the Asia Pacific and South East Asian regions.

Prof. S. Imtiaz Ali

Glaucouma Guidelines
Glaucouma is undoubtedly one of the most common causes of irreversible blindness. There has been an explosion of knowledge in the last ten year about the understanding and the treatment of Glaucoma. The pendulum has again swung back in the favor of medical treatment. In spite of our understanding of changes in the visual fields and the blood supply of the optic disc the emphasis is still on the control of IOP. In light of the circumstances there is an urgent need to provide the practicing ophthalmologist and the general public guidelines for the prevention diagnosis and treatment of Glaucoma. The establishment of the best methodologist throughout the Asia Pacific region represents a unique challenge, given our diverse healthcare service systems and wide range of available resources. To address this need Pakistan Glaucoma Association has decided to update iGlaucoma Guidelines. Most of the materials will be based on the Glaucoma guideline developed by the Glaucoma Interest Groups (GIG) in Pakistan. As president of Pakistan Glaucoma Association (PGA), I express my sincere thanks to Prof. Muhammad Daud Khan reviving the interest in Glaucoma management on a National level. I hope this document will go a long way in helping the doctors engaged in management of Glaucoma in bringing about marked changes in the diagnosis and the treatment of Glaucoma.
Managing Giant Cell Arteritis

Prof. Steven A. Newman, MD, Professor of Ophthalmology, University of Virginia, Charlottesville.
Prof. Jonathan D. Trobe, MD, Prof. of Ophthalmology & Neurology Ann Arbor, University of Michigan
Prof. Valerie Biousse, MD, Professor of Neurology & Ophthalmology Emory University, Atlanta,
Edited by: Barbara Boughton

INTRODUCTION:

Giant cell arteritis (GCA), a well-known vasculitis, can be a true medical emergency in ophthalmology. Also called temporal arteritis, GCA causes devastating vision loss in one of five patients. If left untreated, up to 50 percent of patients will experience vision loss in the opposite eye within days or weeks of onset. While the use of corticosteroid treatment is well-established in GCA, controversy remains over whether intravenous or oral administration of treatment is more effective. There is also controversy over what role steroid-sparing anticoagulants may play.

GCA is sometimes seen in people in their 50s, but it is most common in those over 65. It should be suspected in any patient with sudden vision loss as well as various symptoms that often accompany the disease—jaw claudication, headache, scalp tenderness, recent weight loss, fevers, chills and sweats said Prof. Steven A. Newman. In 25 percent of cases, however, there are no systemic symptoms. Ophthalmologic symptoms, in addition to vision loss, can include problems with motility leading to diplopia, an examination will sometimes reveal a pale, swollen optic nerve said Prof. Jonathan D. Trobe.

Serologic tests that include erythrocyte sedimentation rate (ESR), C-reactive protein and platelet count can help make the diagnosis of GCA. While the sedimentation rate is sensitive for GCA, it is not specific. If C-reactive protein suggests inflammation and the platelet count is elevated, the physician should suspect GCA.

The only definitive confirmation of GCA is temporal artery biopsy. However, because of the possible devastating consequence of GCA, steroids should be started before biopsy in patients who show clinical signs and whose disease—jaw claudication, headache, scalp tenderness, recent weight loss, fevers, chills and sweats are diagnostic for the disease, shown Prof. Jonathan D. Trobe.

TREAT AGGRESSIVELY:

One argument for aggressive treatment is to prevent involvement of the opposite eye. And some studies have reported up to 15% of patients may experience improved vision in the affected eye with aggressive treatment.

THE STEROID QUESTION:

A looming question in treating GCA, especially in those who are elderly, is how best to use steroid treatment aggressively but with enough care to minimize side effects, such as osteoporosis, hyperglycemia, diabetes and hypertension. In elderly patients with giant cell arteritis, more than 50 percent are ultimately going to have complications due to steroid therapy. The steroids should be tapered off soon to minimize the complications because the complications can be severe, even possibly fatal.

The route of administration of steroids has also become a matter of some controversy. Although many physicians prefer to treat patients who have GCA with an initial intravenous treatment of steroids, there are no prospective trials that show this is superior to oral steroids. The key question is whether IV steroids actually provide better outcomes. One controlled, randomized trial showed that induction treatment with high-dose, pulsed IV methylprednisolone allowed a shorter course of high-dose therapy. Oral steroids could then be tapered more quickly to minimize side effects.

According to Prof. Valerie Biousse, most patients are started on oral dose of 1mg/kg per day and reach about 20 mg per day at six months and then 10 mg per day at one year. During this time it is important that the ophthalmologist follow the patient closely and coordinate treatment with his or her primary care physician so that complications of steroids can be minimized, includes providing adjunctive treatment such as vitamins or bisphosphonates to reduce the risks associated with osteoporosis, or even providing an oral hypoglycemic agent or insulin if blood sugar is persistently elevated.

Close monitoring during steroid tapering is a necessity because GCA is considered as a moldering disease. More than half of patients with the disease have at least one recurrence during tapering. Serologic tests that show subclinical disease activity, even without symptoms, can predict such a recurrence. Even after steroids are discontinued, it’s wise to follow patients for at least one year. Because of the danger of recurrence, patient’s education is vital. “You have to emphasize to your patients that if they experience any recurrent symptoms, they need to let their physician know about it right away.”

THE ANTICOAGULANT QUESTION:

Another area of controversy in GCA is the use of anticoagulants. There are few data on anticoagulants, but there are some hints in the scientific literature that antiplatelet therapy may reduce the inflammation seen in GCA. In two clinical studies, patients with GCA who were treated with both steroids and aspirin also had a reduced risk of presenting with ischemic complications such as
stroke.³ Other studies have shown that antiplatelet or anticoagulant therapies produced a lower incidence of ischemic events, including vision loss or stroke.³ “We know that aspirin is protective in terms of risk of systemic vascular complications in GCA, so it makes sense to provide patients with giant cell arteritis with antiplatelet agents, particularly those who have vascular risk factors. The use of aspirin as an adjunct to corticosteroids in the treatment of GCA, unless it is contraindicated, is very much recommended. Dr. Biousse said that there is no reason to think that other antiplatelet agents besides aspirin would not be helpful in patients with GCA. Dr. Trobe said that on occasion he has used heparin for acute treatment and warfarin for three months in GCA, but only when the patient has lost vision in one eye and is showing signs of losing vision in the opposite eye. That’s part of the art of managing GCA, rather than the science.

Because standard therapy currently involves a very big commitment to steroids, clinicians have searched for other agents that may be effective, Dr. Biousse said. It is a search that has not gone very far. The drug that perhaps has gotten the most attention is methotrexate, but so far studies for treating GCA have not been promising.

**TNF inhibitors:** (Anti TNF-Therapy.) Because examinations of the vessel walls of GCA-positive pathology specimens have isolated the cytokine tumor necrosis factor-alpha within T cells, giant cells and macrophages, drugs directed against TNF-alpha, such as infliximab, have been proposed as a possible solution. There have been some positive case reports of remission with this drug, but a recent controlled, randomized, multicenter trial showed no benefit.³

**Methylprednisolone.** The best steroid-sparing drug is really IV methylprednisolone, which allows you to taper oral prednisone faster. Paradoxically, some of the systemic symptoms can be relatively well tolerated by patients, leading to dangerous neglect of the situation. Sometimes there is an unwillingness or inability to express the non-ophthalmic symptoms, or a desire of patients not to bother their physicians, so that these symptoms are not reported. Then the patients suddenly become blind.

Consequently, it is vital that acute vision loss in patients over age 65 be assessed urgently. These patients have to be seen immediately, even if it is Sunday because you could be in the position to save vision in the opposite eye by getting high-dose steroids to the patient immediately. With giant cell arteritis, you can intervene and truly make a difference.

**REFERENCES:**

(Courtesy: EyeNet AAO)
How Compliance can help save Glaucoma patients from loosing Sight

Omer Safdar, Business Unit Manager
Schazoo Laboratories, Lahore

Though the patients who don’t take their medication, won’t achieve the desired results, it is estimated that up to 25% of glaucoma patients take none of their medication. Another sizable percentage doesn’t take all of it or take it improperly. Unfortunately, some glaucoma patients have a particularly tough time with compliance for several reasons.

An important goal of glaucoma treatment is to prevent further vision loss. However, a treated glaucoma patient often cannot immediately tell whether or not treatment is successful because there is not a fast and dramatic outcome. Compounding the problem is the fact that many glaucoma medications have unpleasant side effects, as glaucoma is a chronic disease often requiring many years of treatment, which can be inconvenient and quite expensive. The result: many patients simply “forget” to take their medication.

Another problem is when patients take medication incorrectly too much, too little at the wrong time, etc. This isn’t entirely surprising since many glaucoma regimens are not easy to follow and require multiple medications taken every day at very specific intervals. But when taken improperly the full effect will not be obtained. For example, not waiting even five minutes between taking another eye drop medications, is a common mistake.

Compliance with your medication regimen is, indeed, critical. After all, the most recent diagnostic and treatment advances are to no benefit if patients are non-compliant. In fact, non-compliance has proved to be a leading cause of glaucoma blindness especially in a developing country due to poor education of masses and lack of awareness regarding medication of the diseases.

SEVEN TIPS TO HELP MAKE FULL USE OF MEDICATION:

1. **Communicate fully with your doctor.** Ask questions about the medications, results and possible side effects. If side effects are intolerable, let your doctor(s) know as soon as possible so that they can work on finding a more suitable medication.

2. **Make sure you have the information you need.** Detailed regimens can be hard to remember. Ask the doctor to write out the treatment plan in large clear letters, and if necessary, color-code the medications and instructions.

3. **Bring a friend to your appointment.** Ask a friend or family member to come with you to your appointment and help ensure you capture all the details. This can be especially helpful if your diagnosis is recent, since the diagnosis may create a shock-like state that makes it hard to absorb all the information the doctor provides.

4. **Put in drops correctly.** Ask your doctor to demonstrate proper techniques of eye drop administration. By doing this correctly, (including one to two minutes of index finger pressure to the tear duct) you can help ensure proper dosage and drastically reduce the amount of medication that gets into the bloodstream.

5. **Write things down.** In addition to taking your own notes at the doctor’s office, keep a list of drug reactions, their timing, etc. so you won’t have to rely on memory at your next appointment.

6. **Utilize the medical support team.** Trained staff at your doctor’s office, such as nurses and technicians, can be an enormous support to helping you manage your disease. These knowledgeable professionals can often give you the information, time, and attention that can make a big difference.

7. **Take advantage of the Glaucoma Associations.** We can provide a wealth of information, resources, and support to help you manage your disease and prevent vision loss.

**NUTRITION AND GLAUCOMA:**

In a world where the information we get seems to come fast and change even faster, some of the foods we’re now being told to eat, or not to eat, may surprise you.

**Carrots** were always thought to be good for protecting vision. But, according to Steven G. Pratt, MD, senior staff ophthalmologist at Scripps Memorial Hospital and assistant clinical professor of ophthalmology at the University of California, San Diego, carrots may be good for you but they do not play as big a role in vision as once thought. It turns out that carrots are high in beta-carotene, also an antioxidant, not usually related to the eye. So carrots’ ability to protect vision may actually be limited.

**Spinach,** on the other hand, contains high amounts of antioxidants, lutein and zeaxanthin which are nutrients that are found in high amounts in your eyes, in fact, in higher amounts than all other vegetables. It is believed that these two nutrients may be important for protecting your eyes against some of the bad effects that can be caused by oxygen. That’s why they are called antioxidants. In fact, many doctors are beginning to tell their patients to eat more spinach and other green leafy vegetables and/or to take supplements rich in antioxidants to help with all kinds of problems, including cataracts and glaucoma. There are also other nutrients thought to be good for protecting vision because of their antioxidant abilities, including vitamins C, E, A, and zinc.

**UNDERSTANDING NUTRITIONAL SUPPLEMENTS**

As food has become more refined, and many of the
important nutrients have been processed out, doctors are advising their patients to start supplementing their regular diets. This practice has been common in many countries. For instance, Europeans have been regularly supplementing their diets for many years and the Chinese have been using herbal remedies for thousands of years. Now the supplement business has grown into a multibillion-dollar industry in the last decade.

Supplements are vitamins, minerals, or herbs that you can buy and take as a way of adding to the nutrition you already get from your daily diet. They usually come in tablet or capsule form but some are a powder that you can mix into a drink.

**POSSIBLE PROBLEMS:**

Just when we think we have a healthy diet, we learn that it is possible to overdo it. There are dangers of taking too much of a given vitamin or supplement. For instance, too much Vitamin A can cause you to have headaches, vision problems, nausea, vomiting, and dry flaking skin, or even enlarge your liver or spleen. Too much Vitamin C may cause nausea, diarrhea, reduced selenium and copper absorption, and increased kidney stone formation. Taking too much vitamin C could even cause you to have a false-positive reaction to diabetes tests. And some studies have shown that vitamin E (in supplement form) can actually raise your cholesterol. Too much zinc in your diet could cause a mineral imbalance and too much chromium can result in iron deficiency anemia. While vitamins and supplements may be good for you, you should treat them with the same idea that you are treating yourself with a drug. Always check with your doctor and make sure you’re taking the proper amount.

**HOW TO BE SAFE & HEALTHY:**

Many doctors strongly believe that supplements are the best thing for their patients and advise their patients to take them. Others believe you can get everything you need by simply eating a healthy diet. Some doctors are worried that since there is no governmental control over the supplement industry, there’s no way to be sure that what’s on the label is what you’re really getting in the bottle. All of this needs to be thought about when looking at your overall health. The safest way is to always eat a healthy, well balanced diet and talk to your doctor about what is best for you.

**LIST OF FOODS HIGH IN ANTIOXIDANTS**

- **Vitamin C:** Citrus fruits, Berries, Tomatoes, Peppers, Cabbage, Broccoli, Brussels, Sprouts, Cauliflower, Cantaloupe
- **Vitamin E:** Vegetable oils (wheat germ oil is especially rich in vitamin E), Wheat and other cereal grains, Green leafy vegetables, Egg yolks, Milk fat, Butter, Meat, Nuts, Organ Meats, Seafood, Avocados
- **Vitamin A:** Liver, Egg yolks, Whole milk, Carrots, Sweet potato, Kale Turnip greens, Mustard greens, Pink Grapefruit, Broccoli, Cantaloupe, Apricots, Beet greens, Collard greens, Papaya, Red Peppers, Cheddar cheese
- **Zinc:** Lean meat, Seafood, Eggs, Green leafy vegetables, Soybeans, Peanuts, Whole Bran, Whole cereals, Cheese, Oysters

**Lutein And Zeaxanthin:** Kale, Collard greens, Spinach, Parsley (not dried), Celery, Broccoli, Lettuce, Green peas, Pumpkin, Brussels sprouts, Summer squash, Corn, Green beans, Green peppers, Cucumbers, Green olives.

**DAILY LIFE**

- You will probably need to make just a few changes to your lifestyle in order to manage your glaucoma effectively. As long as you are diagnosed early, visit your doctor regularly, and follow your recommended course of treatment, you can continue to live your life fully.
- Try to schedule time for taking medication around daily routines such as walking, mealtimes, and bedtime. In this way, your medications will become a natural part of your day.
- In addition to taking care of your physical health, it’s equally important to pay attention to the other side of glaucoma—the emotional and psychological aspects of having this disease.
- Be sure to share your feelings. Confide in a relative, a close friend, or a member of the clergy. You may also want to talk with other people who have glaucoma. Sharing ideas and feelings about living with a chronic health condition can be useful and comforting.
- Don’t let glaucoma limit your life. You can continue with what you were doing before glaucoma was diagnosed. You can make new plans and start new ventures. The eye care community, including the Pakistan Glaucoma Association will keep looking for better methods to treat glaucoma and will eventually find a cure.
- Some daily activities such as driving or playing certain sports may become more challenging. Loss of contrast sensitivity, problems with glare, and light sensitivity are some of the possible effects of glaucoma that may interfere with your activities.

**THE KEY ISSUE IS TO TRUST YOUR JUDGMENT.**

- If you are having trouble seeing at night, you may want to consider not driving at night. Stay safe by adjusting your schedule so that you do most of your travel during the day.
- Sunglasses or tinted lenses can help with glare and contrast. Yellow, amber, and brown are the best tints to block out glare from fluorescent lights. On a bright day, try using brown lenses for your glasses. For overcast days or at night, try using the lighter tints of yellow and amber.
- Experiment to see what works best for you under different circumstances.
How to Diagnose & Treat Angle-Recession Glaucoma

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Dr. Sarwat Salim, MD, FACS, Associate Professor of Ophthalmology
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INTRODUCTION:
Traumatic glaucoma is a multi-factorial group of disorders that results from closed or open-globe injuries. Although different underlying mechanisms may be involved with the initial injury, the resulting optic neuropathy and visual field loss is secondary to elevated IOP from reduction in aqueous outflow through the trabecular meshwork. Secondary glaucoma after trauma is more likely to occur with a closed-globe injury, but it is often under-diagnosed because its onset may be delayed and the history of eye injury may be remote or overlooked.

Angle recession is a common manifestation of blunt ocular trauma and involves rupture of the ciliary body face, resulting in a tear between the longitudinal and circular fibers of the ciliary muscle. Angle recession is reported to occur in 20 to 94 percent of eyes after blunt trauma and is often masked initially due to the presence of concomitant hyphema, which results from shearing of the anterior ciliary arteries. Approximately 5 to 20 percent of eyes with angle recession develop angle-recession glaucoma. This brief review will discuss the patho-physiology and clinical course and signs of angle-recession glaucoma, along with differential diagnosis and treatment strategies.

PATHOPHYSIOLOGY:
Blunt force to the globe causes an anterior to posterior axial compression with equatorial distension. Abrupt indentation of the cornea forces posterior and lateral displacement of aqueous humor, deepening the peripheral anterior chamber and increasing the diameter of the corneoscleral limbal ring. These resultant shock waves traversing the interior of the globe are responsible for other anterior segment damage accompanying angle recession, such as pupillary sphincter tears, iridodialysis, cyclodialysis and zonular tears.

The shearing forces to the drainage angle result in a tear between the longitudinal and circular fibers of the ciliary muscle. While the longitudinal muscle insertion at the scleral spur remains intact, the circular muscle is displaced posteriorly along with the iris root and pars plicata. The resultant glaucoma is not due to angle recession per se, but is secondary to initial trauma to the trabecular meshwork, with subsequent degenerative changes and scarring, which leads to obstruction of aqueous outflow.

Less often, a hyalinized membrane may cover the inner surface of the trabecular meshwork. This membrane may be continuous with Descemet’s membrane and may extend peripherally into the recessed angle and onto the anterior surface of the iris. The membrane obstructs aqueous outflow, causing an open-angle form of glaucoma. In some cases, this membrane may contract, resulting in angle-closure glaucoma.

CLINICAL COURSE & SIGNS:
As mentioned previously, 5 to 20 percent of eyes with angle recession develop angle-recession glaucoma. Onset is extremely variable and may occur soon after the initial trauma or even years later, indicating possibly separate pathologic mechanisms. The risk of developing angle-recession glaucoma appears to be related to the extent of angle recession. Angle recession of more than 180 degrees is deemed a considerable risk for secondary glaucoma, although glaucoma can develop when the area of recession is smaller than this.

In one study, researchers found that approximately 50 percent of patients with traumatic glaucoma developed open-angle glaucoma in the unaffected, contralateral eye, suggesting that these patients may have an underlying genetic predisposition for developing glaucoma, which may be accelerated by a traumatic insult. IOP may rise immediately after the injury, as a result of associated co-morbidities such as hyphema, iridocyclitis or pupillary block from ectopia lentis (with or without vitreous prolapse). In some cases, IOP may be low secondary to decreased production of aqueous humor from associated inflammation, a transient increase in aqueous outflow facility from disruption of structures in the angle, or the presence of a cyclodialysis cleft.

Anterior segment examination is important. Once the acute inflammation and hyphema resolve, attention should be paid to the anterior chamber depth of the affected eye, which may appear deeper. The meticulous physician will also look for other abnormalities encountered with trauma, iris sphincter tears, mydriasis, iris atrophy, iridoschisis, iridodonesis, phacodonesis and a subluxated lens.

Gonioscopy, a simple diagnostic test, is essential for making the clinical diagnosis of angle recession. It is usually deferred for four to six weeks after the acute injury. When gonioscopy is performed, asymmetry of the angle recess may be noticeable between the affected and the nontraumatized eye or in different quadrants of the involved eye. Widening of the ciliary body band may be present due to retrodisplacement of the iris root. Other signs include irregular and darker pigmentation in the angle, whitening of the scleral spur due to visibly fractured iris processes, or the presence of peripheral anterior synechiae. Gonioscopy may aid in the diagnosis of other angle abnormalities from trauma, such as iridodialysis or cyclodialysis. It’s essential to note that, in some cases, the gonioscopic findings may become more difficult to recognize with the passage of time.
**Posterior segment examination** will detect abnormalities that may also be present, and a dilated fundus exam should be performed after gonioscopy.

**Differential Diagnosis:**

After the trauma occurs, elevated IOP may be secondary to obstruction of the trabecular meshwork by red blood cells, inflammatory cells or pigmented cells. Later, ghost-cell glaucoma may develop from long-standing vitreous hemorrhage and a disrupted anterior hyaloid face or an open posterior capsule. Prolonged treatment with steroids can lead to steroid-induced glaucoma. Although the diagnosis of angle-recession glaucoma is evident after careful gonioscopy and optic nerve examination, other differential diagnoses for unilateral glaucoma should be considered. These include—but are not limited to—pseudoexfoliative glaucoma, neovascular glaucoma, uveitic glaucoma, lens-particle glaucoma and phacolytic glaucoma.

**Treatment (Three Options)**

**Medication.** In the acute setting, treatment should be directed at lowering IOP and controlling inflammation. Topical steroids and cycloplegic agents are used to control inflammation and pain. Aqueous suppressants are preferred as initial IOP-lowering agents. Prostaglandin analogs have a theoretical benefit of bypassing the dysfunctional trabecular meshwork by increasing uveoscleral outflow. Miotics should be avoided because they can cause a paradoxical rise in IOP, presumably due to a reduction in uveoscleral outflow.

**Laser.** Laser trabeculoplasty is not effective in angle-recession glaucoma due to distortion of the angle anatomy and trabecular meshwork scarring. An alternative laser procedure, Nd:YAG laser trabeculopuncture, has produced variable success rates, with better responses seen in cases where some trabecular meshwork structure was intact on gonioscopy, permitting penetration into Schlemm’s canal with an increase in aqueous outflow facility.

**Surgery.** Filtration surgery has a lower success rate in angle-recession glaucoma than it does in primary open-angle glaucoma. The adjunctive use of anti-metabolites can improve the success of trabeculectomy. Researchers have found greater IOP reduction, where antimetabolites were employed with trabeculectomy than in trabeculectomy alone or Molteno tube implantation alone. Glaucoma drainage devices have demonstrated some benefit, but their success rates are lower in angle-recession glaucoma than with other types of glaucomas. In eyes with limited visual potential, a cyclodestructive procedure may be an alternative option.

**Summary:**

A patient with blunt ocular trauma should be checked for the presence of angle recession and other abnormalities. The risk of ARG co-relates with the extent and severity of angle recession. In general, it is more difficult to control other types of glaucomas because ARG can occur even many years after trauma, patients should receive adequate counseling, and follow-up examinations should be performed regularly.

**References:**


**Case Report**

**Cat-Scratch Neuro-retinitis**

Dr. Randy H. Kardon, MD, PhD,
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Edited by: Michael P. Kelly, CPT.

A healthy 17-year-old Caucasian male presented with deteriorating vision in the right eye - 20/300, with a relative afferent pupillary defect and a ceco-central scotoma. Examination revealed optic disc edema with a retinal infiltrate and fluid adjacent to the nerve continuous with edema in the macula. The optic nerve appearance and the vision in the left eye were normal.

The patient was suspected to have neuroretinitis in the right eye, but on presentation there was no macular star figure, which is characteristic of the disease. He had pet cats but no clear history of being exposed to a recent cat scratch or bite. A serum titer for antibody IgG to Bartonella was mildly elevated to a titer of 1:64 on presentation. A convalescent titer five weeks later had risen to 1:128, consistent with a diagnosis of neuroretinitis. As the retinal fluid and optic disc edema resolved, the cecocentral scotoma resolved.

Visual acuity in the right eye had improved to 20/50. At that time, a well-defined macular star figure was present due to the resolution of the fluid, leaving exudates forming the specific star pattern.
New Discoveries for Cure of Glaucoma

Dr. Philip J. Horner, PhD
University of Washington

INTRODUCTION

The researchers have shown that the primary cells affected in glaucoma are the ganglion cells and they do not die in early stages of the disease as the process of degeneration is slow like many other neurodegenerative diseases. They are now thinking how to prevent or slow down the process.

They have shown that Glaucoma is not a “Cell Autonomous” disease and suggested that other cells in the retina are equally affected and equally contribute in the process of degeneration – a key understanding in the way neuro-degeneration occurs. When a cell is under stress it is in communication with other cells leading to degeneration. The data suggests that there may be a ‘Master Program’ and a coordinator for the process of degeneration which links all the cells together. Once they trace the coordinator they may be able to turn off that program and that would be a way to potentially stop the degeneration and save the vision.

In fact Glaucoma appears to be a part of the family of Neuro-degenerative diseases. It has been shown in Parkinsonism as well as in ALS that we can manipulate a gene in the supporting cell around the neurons and if we stimulate a specific stress pathway in the supporting cells, we can dramatically slow down the disease process. Researchers have found the same pathway is prevalent in Glaucoma. They are slow in activating these supporting cells in early stage of Glaucoma. Thus we can protect the ganglion cells by increasing its resistance to oxidative stress through a protein by blocking the pressure signal that ganglion cells make or by manipulating the microglia or inhibiting the astrocytes – all supporting these cells. They do not cure the disease but simply slow down the process.

We are trying to find a ‘linker’ – a common mediator for these varying cells we call the pathways, to shut down the whole degenerative program or slow down so much to the level of ‘Essential Cure’.

Strategic Goals:

I. Protect and Restore the Optic Nerve:

Protecting and restoring the optic nerve is the key to stopping the progression of glaucoma. Every advance that is made toward understanding ways to protect the optic nerve from the damage that leads to visual field loss in glaucoma brings us a step closer to helping those with glaucoma, and those at risk, to lead healthy, fulfilling lives.

II. Understand the Intraocular Pressure System and develop better treatments:

To date, reduction of Intraocular Pressure, is the scientifically proven method for treating glaucoma. Lowering the IOP helps to protect the optic nerve from further damage. Although researchers now agree that lowering IOP is only a partial solution, there is no doubt that a better understanding of the relationship between IOP and glaucoma will continue to lead the way to better glaucoma treatment therapies.

III. Accurately monitor Glaucoma’s progression:

Glaucoma often affects the optic nerve and the retina many years before patients experience any vision loss, so early diagnosis and detection is the most effective way to limit damage to the optic nerve and prevent disease progression. Since damage is irreversible once it occurs, developing new technologies to accurately track structural and functional changes and monitor glaucoma progression is essential for scientists and specialists seeking to understand the disease and discover ways to minimize or even reverse its progression.

IV. Finding the Genes responsible for Glaucoma:

There are many different forms of glaucoma, and the most common types are hereditary. Genes are the material that control all the cells that make up the human body. Despite many years of research, scientists still don’t know why glaucoma develops in some people and not in others. However, it is known that a family history of glaucoma is a risk factor for developing glaucoma. Finding the genes that cause glaucoma will help researchers develop new methods of testing people at risk based on a simple blood test. Furthermore, identifying the genes responsible for glaucoma will help scientists better understand the underlying causes of the disease, and may lead the way to modalities for intervention.

V. Determine the Risk Factors of Glaucoma

Some people are at higher risk for glaucoma. Known risk factors are age, race, family history, and other medical or eye conditions (especially high intraocular pressure). While some people with one or more risk factors may never develop glaucoma, others develop the disease and have no known risk factors. A better understanding of glaucoma’s risk factors will help researchers piece together the larger glaucoma puzzle. Knowing the risk factors will help people at risk to make healthy lifestyle choices and assist Ophthalmologists to make earlier diagnoses and clinically monitor the progress of patients at risk.

Glaucoma Medications and their Side Effects

A variety of options are available to treat glaucoma. These include eye drops, laser procedures, and surgery. All are intended to decrease eye pressure and, thereby, protect the optic nerve. Currently, eye drops are often the first choice for treating patients. For many people a combination of
medications and laser treatment can safely control eye pressure for years.

Eye drops used in managing glaucoma decrease eye pressure by helping the eye's fluid to drain better and/or decreasing the amount of fluid made by the eye. Drugs to treat glaucoma are classified by their active ingredient. These include: prostaglandin analogs, beta blockers, alpha agonists, and carbonic anhydrase inhibitors. In addition, combination drugs are available for patients who require more than one type of medication.

Prostaglandin analogs include Xalatan®, Lumigan®, and Travatan Z®, and they work by increasing the outflow of fluid from the eye. They have few systemic side effects but are associated with changes to the eye itself, including change in iris color and growth of eyelashes. Depending on the individual, one of these brands may be more effective and produce fewer side effects.

Beta blockers such as timolol are the second most often used class of medication and work by decreasing production of fluid. They are available in generic form and, therefore, are relatively inexpensive. Moreover, systemic side effects can be minimized by closing the eyes following application or using a technique called punctal occlusion that prevents the drug from entering the tear drainage duct and systemic circulation.

Alpha agonists (Alphagan® P, Iopidine®) work to both decrease production of fluid and increase drainage. Alphagan-P has a purine preservative that breaks down into natural tear components and may be more effective for people who have allergic reactions to preservatives in other eye drops. Alphagan is available in a generic form.

Carbonic anhydrase inhibitors (CAIs) reduce eye pressure by decreasing the production of intraocular fluid. These are available as eye drops (Trusopt®, Azopt™) as well as pills [Diamox® (acetazolamide) and Neptazane® (methazolamide)].

Combined medications can offer an alternative for patients who need more than one type of medication. In addition to the convenience of using one eyedrop bottle instead of two, there may also be a financial advantage, depending on your insurance plan. Cosopt® is a combination of a beta blocker (timolol) and a carbonic anhydrase inhibitor (Trusopt). Combigan™ is new and combines an alpha agonist (brimonidine) with a beta blocker (timolol).

TREATMENT CONCERNS

Of course, no eye drop medication can be effective if it is not taken as prescribed. There are a number of reasons why people being treated for glaucoma may not take their medications. One reason is that they simply forget! Remembering to take a daily medication is one of the challenges in the treatment of any chronic condition, and glaucoma is no exception. Some ways to help remember include tying a regular daily activity (such as brushing one's teeth) to taking one's medication, or setting timed reminders such as an alarm clock or cell phone. A second factor in not taking medication as prescribed is economics. Glaucoma drugs can be expensive. Your doctor can help you find financial assistance if you need it; some pharmaceutical companies offer programs to patients who can't afford the drugs they need. Also, some medications may be covered by your insurance while others are not. Your consultant will work with you to recommend the best choice for you.

For patients who cannot tolerate medications or for whom medication alone has not been adequate, laser treatment continues to be an excellent alternative. It should be noted that laser may also be used as primary treatment. The advantage of this approach is that if adequate pressure lowering is achieved with laser treatment alone, the need for taking a daily medication may be delayed, along with the associated side effects. The effect of laser treatment is typically not permanent, and many patients will eventually require medications. The most common laser treatments for glaucoma are argon laser trabeculoplasty (ALT) and selective laser trabeculoplasty (SLT). A new type of laser treatment called MicroPulse laser trabeculoplasty (MLT) is currently being studied as yet another option for effectively increasing drainage of eye fluid to lower pressure.

Side Effects

Potential side effects of the most commonly prescribed glaucoma medications:

- **Prostaglandin Analogs**: possible changes in eye color and eyelid skin, stinging, blurred vision, eye redness, itching, burning.
- **Beta Blockers**: low blood pressure, reduced pulse rate, fatigue, shortness of breath; rarely: reduced libido, depression.
- **Alpha Agonists**: burning or stinging, fatigue, headache, drowsiness, dry mouth and nose, relatively higher likelihood of allergic reaction.
- **Carbonic Anhydrase Inhibitors**: in eye drop form: stinging, burning, eye discomfort; in pill form: tingling hands and feet, stomach upset, memory problems, depression, frequent urination.

Side effects of combined medications may include any of the side effects of the drug types they contain.

(Excerpts taken from the original with acknowledgment – on line EyeNet, AAO)

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**Malignant Hypertension**

The fundus shows optic-disk hyperemia and blurring, retinal hemorrhage, a macular star with lipid deposits, and venous congestion. These findings are most consistent with malignant hypertension; this patient's blood pressure was 210/130 mm Hg at presentation. These ocular findings can also be caused by: Differential Diagnosis: Blood dyscrasias, Systemic lupus erythematosus, Neuroretinitis, Sarcoïdosis, and Eclampsia.

Other Possibilities, Cholesterol embolism, Diabetes mellitus

(Courtesy: NEJM, UK)
Cupping vs Sinking

Glaucoma Update

Cupping Optic Disc Paradigm

1. In cupping disc paradigm the optic disc is assumed to be a fixed structure in the scleral canal similar to corneo-scleral junction. Therefore it is assumed that the high IOP can only enlarge or excavate the physiological cup (original cup) without displacing the disc in the scleral canal.

2. Physiological cup is enlarging concentrically as a result of high IOP known as cupping.

3. In cupping the lamina cribrosa is believed to be primary site of injury.

4. Cupping implies that axons are atrophied due to compression of the axons in the holes of the lamina cribrosa due to high IOP.

5. In cupping the excavation is believed to be compression of the axons and glial tissue.

6. If cupping were occurring, the central vision fibers because of their central and superficial location (closer to vitreous) should be destroyed first, but this is not occurring.

7. Cupping of the disc implies that pathology starts from the central part of the disc and extends to the peripheral part of the disc.

8. If cupping is caused by high IOP then we should be able to halt the disease by lowering of IOP.

9. Cupping of the disc can’t explain higher incidence of glaucoma in myopia.

Sinking Optic Disc Paradigm

1. Optic disc is not a fixed structure in the scleral canal like corneo-scleral junction. Optic disc is separated from the scleral edge/rim by the circular border tissue of Elschnig which acts as a ‘O’ ring seal. Due to atrophy of the border tissue the disc becomes loose and starts sinking.

2. Physiological cup is not truly enlarging but breaking up or de-cupping.

3. In sinking disc the circular border tissue of Elschnig is believed to be site of injury.

4. Sinking of the disc implies that pre-laminar axons prior to their entry into lamina cribrosa are being severed against the scleral edge.

5. In sinking disc, the excavation is due to creation of empty space as a result of severing and depletion of the axons.

6. Sinking of the disc implies that peripheral vision axons, because of their deeper location (closer to sclera) should be destroyed first and this is exactly what occurring in glaucoma.

7. Sinking of the disc implies that the pathology starts from the deep peripheral fibers and finishes at the central axons and this fact is supported by the visual fields, that the peripheral fields are destroyed first and central at the end.

We can’t halt the disease if optic disc is sinking despite maximally lowering of IOP because sinking disc becomes a mechanical problem like herniation.

8. Sinking of the disc can explain higher incidence of glaucoma in myopia due to thinness/stretching of the border tissue due to enlarged myopic eyeball.

9. Sinking of the disc can explain nasal shifting of the blood vessels due to loss of anchorage from severance of the temporal axons more so than the nasal axons due to usual temporal tilt of the disc. Analogy: If roots of a tree are severed from one side the tree is shifted to opposite side.
10. Sinking of the disc can explain glaucoma being a multifactorial disease since multiple systemic factors can affect the oxygenation and nutrition of the border tissue.

11. In sinking disc the axons are being severed, histology of the intermediate stage glaucomatous disc reveals segmental disappearance of the axons in the compartments previously occupied by the axons. Empty compartments get filled with mucoid material. Presence of empty compartments indicate that axons are being severed and not atrophied. (Ref: Ophthalmic Pathology by Hogan and Zimmerman. Second edition P 627)

12. If disc is sinking then size of physiological cup does not influence in the progression of glaucoma

13. In sinking disc the arcuate axons are selectively destroyed because of their fewer number compared to the macular axons. All the temporal axons consisting of superior, inferior arcuate and centrally located macular axons are being severed simultaneously. However since the arcuate axons being fewer in number will be depleted earlier resulting in arcuate field defects.

14. Histology of the end-stage glaucomatous disc reveals an empty crater. There are no axons and no lamina. Why do we call end-stage 100% cupped disc when optic disc is no longer present.

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Letters to the Editor

Dear Prof. Durrani,

I really admire you that you are publishing Ophthalmology Update of your own. Publishing an ophthalmology journal on regular basis requires lot of work, dedication and financial resources. Pakistan is very lucky to have dedicated ophthalmologist like you who are so concerned in upgrading ophthalmology profession. No surprise, you are recipient of highly prestigious award from Pakistan.

Syed S. Hasnain M.D.
California, USA

Dear Prof. Yasin Khan Durrani,

Thank you very much. I got your edited† journal International Ophthalmology Update† today. I liked it and believe this journal is useful for all ophthalmologists.

With regards

Prof. M. Nazrul Islam
General Secretary,
Bangladesh Glaucoma Society

Dear Prof. Durrani,

Many thanks for sending me a copy of the journal Ophthalmology Update. Very nice illustrations and good layout as well as excellent standard of print. I will do my best to contribute scientifically towards it.

Very best wishes,

Imran Akram
Consultant Ophthalmic Surgeon,
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Manchester M28 0YH  UK

Dear Prof. Durrani

Thank you very much Prof. Durrani. I received your journal Ophthalmology Update and looked through it. I was very much impressed. Masha-Allah very well done. As you may know I am a reviewer for journals like i.e. iRetinaî and iBJOî and have also published in almost all major international ophthalmology journals (including PJO, JCPS) in the past. I think you are distributing a good quality journal.

Regards

Dr. Abdul A Kazi, M.D.
Diplomate American Board Ophthalmology
Anniston, AL. USA