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Clinical Evaluation of Management of Amblyopia in Adolescent Age Group (10-19 Years) with Addition of Citicoline to the Conventional Occlusion Therapy

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Abstrect

Clinical evaluation of management of amblyopia in adolescent age group (10-19 years) with addition of citicoline to the conventional occlusion therapy. Abstract Aim - To evaluate efficacy of citicoline as an adjuvant to occlusion and near activity exercise in management of amblyopia in adolescent age group. Material and Methods- We included 79 eligible patients of age group 10-19 years for study. Consent was taken from each of patients. All patients undergone full ophthalmological examination to establish diagnosis of amblyopia and were prescribed their best corrected spectacles. They were divided in three groups using randomization chart, Group A-received full time occlusion, Group B - received full time occlusion and near activity exercises and Group C - received full time occlusion and oral citicoline 500 mg BD for three months. They were followed up four weekly up to 24 weeks. Result- During follow up 9 patients lost to follow up. Out of 70 patients who completed study, 36 (51.43%) showed improvement in their vision for distance. We recorded this improvement in lines on snellenýÿs chart. No improvement was present in 14 patients (58%) in group A, 15 patients (60%) in group B and 5 patients (23.81%) in group C. Among groups, responders were 41.67%, 40% and 76.2% in group A, B and C respectively. The difference among three groups was statistically significant (p value-0.024 chi-square test). Conclusion- Oral citicoline added to occlusion therapy is a new, safe and effective modality for amblyopia management and chances of improvement in visual acuity is better than other treatment options.

Keywords: Strabismus; Amblyopia; Occlusion; Citicoline.

Introduction

Amblyopia is defined as a unilateral or bilateral decrease of visual acuity for which no organic cause can be detected by the physical examination of the eye and in appropriate cases is reversible by therapeutic measures. It is the most common cause of monocular visual impairment in both children and young adults. It affects 3-4% of adult population. There is consensus that amblyopia can be effectively treated in young children up to age of 10 years as in early age visual system shows labiality and ability of reversal of the effect of deprivation. But it has been proved that age is no bar for the success of treatment of anisometropic amblyopia. However there are many studies in older children and adults with amblyopia, showed response to treatment. Various treatment options have been tried for the management of amblyopia but occlusion remains the gold standard.

There is evidence that plasticity of visual system during the sensitive period is dependent on input from noradrenergic neurons and is subject to pharmacological manipulations. More recently there is effort to treat amblyopia with catecholamine which appear to either deactivator or extend the visual system sensitive period of neural plasticity.

Occlusion therapy with patching of sound eye has

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been the conventional treatment in older children along with addition of drug like citicoline is also effective. Hence this study was done to evaluate the various treatment modalities to treat adolescent amblyopia.

Now a day, various studies revealed that there is no demonstrable distinct advantage to prescribing greater number of hours of patching in either the rate or magnitude of improvement after fixed months of therapy. Thus it is most logical to appreciate that pharmacological enhancement to occlusion therapy may overcome certain short comings as compliance, cosmetic blemish of the established occlusion therapy. However, role of occlusion in older children and teenagers is still debatable. Thus, addition of some pharmacological agent potentiates the effect of occlusion in older children and fear of compliance and cosmetic blemish is avoided in young children.

Citicoline (cystidine-5-diphosphocholine) is an intermediate in the making of phosphatidylcholine which is phospholipids in neuronal cell membrane. When the demand of acetylcholine increases, phospholipids in neuronal cell membrane catabolized to supply the needed choline. Thus citicoline stabilized the neuronal cell membrane as well as affect the level of different neurotransmitter and neuromodulators. It has been shown that it increases acetylcholine; nor epinephrine and dopamine level in central nervous system. Recent animal study showing citicholine raised the retinal dopamine concentration thus helps in retinal ganglionic cell regeneration. Choline 1000mg per day was found to be significantly improves visual acuity in patients with amblyopia.

Aims & Objective

To discuss the different treatment modalities of amblyopia in adolescent age group (10-19 years)

To study the effect of addition of citicoline to the conventional occlusion therapy.

Material and Methods

This prospective comparative study was conducted in patients with amblyopia in age group 10-19 years, presenting in OPD of ophthalmology department of MLN Medical College, Allahabad, after taking permission from ethical committee of institute.

Total 79 eligible amblyopic of age group 10-19 years were included in study. Consent were taken from each candidate's parents. Inclusion criteria were, Patients between age of 10-19 years with amblyopia, Inter eye acuity difference of 2 or more lines, history of or presence of amblyogenic factors strabismus, anisometropia or both. Refractive correction prescribed and worn for at least four weeks prior to enrollment in study Patients with any history of previous treatment, Stimulus deprivation amblyopia, Amblyopia with eccentric fixation and presence of nystagmus were excluded.

A detailed history was taken from each patient at the time of presentation including family history. A complete ocular examination were done, which included baseline visual acuity at 6 meters with snellen chart, refraction under cycloplegia, best corrected visual acuity ,ocular motility and alignment evaluation ,anterior segment examination by slit lamp, fundus examination and assessment of fixation pattern , binocular function by Worth Four Dot Test, Stereopsis by TNO test, synaptophore examination as required Refractive correction prescribed and worn for at least four weeks prior to enrollment in study. Then they were randomly divided in to three groups Patients were given spectacle correction for one month and then randomly divided into three groups.

Group A (28) received only occlusion therapy along with full refractive correction.

Group B (28) received occlusion, near activity exercises along with full refractive correction.

Group C (23) received oral citicoline 500mg BD for three months, occlusion along with full refractive correction.

Follow up was done at one week, two weeks, one month, two months and three months. The frequency and composition of successive follow up evaluation was depend upon age of the patient and severity of amblyopia. At every follow up, each patient was assessed for visual acuity, line of improvement, fixation pattern, stereo acuity, side effects of occlusion including occlusion amblyopia, and level of compliance. Side effect of drug, speed of recovery.

Finally a meticulous counseling was performed for regular maintenance of a diary by patients/ parents and its regular check-up. All efforts were done to build up confidence towards occlusion method of therapy thus making good compliance and acceptance to achieve a much higher level of success.

Results

Total 70 patients were enrolled in the study. Out of which 9 patients were excluded from the study

due to irregular follow up or poor compliance to patching and prescribed treatment. We assessed them and made our observation on the following parameters: Age, Sex, Laterality of eye, Presenting complaint, Type of amblyopia, Depth of amblyopia, Refractive error, Visual acuity improvement in each group, responders/nonrespondes, side effects The mean age of our study group was 14.67 years (SD - 2.90). Our study population consisted of 60% male and 40% female patients. Most common presenting complaint in our patients was diminution of vision (75.71%), followed by deviation of eye (24.28%). Anisometropia was the most common cause of amblyopia in our study population affecting 74% of population, followed by combined anisometropia and strabismus affecting 17.14% patients, 4.48% isometropia and 4.48% strabismus. Most common type of refractive error found in our study population was hypermetropia (70% of patients) followed by myopia (17.14% of patients) and astigmatism (12.86%).

Baseline visual acuity was FC-6/60 in 57.12% of total patients, 6/60-6/36 in 25.71%, 6/36-6/24 in 11.42% and 6/24-6/18 in 5.7% of patients in study population.

Table 1: Baseline visual acuity in study groups

Visual acuity	Group A	Group B	Group C
FC – 6/60	13	15	12
6/60 – 6/36	6	7	5
6/36 – 6/24	3	3	2
6/24 – 6/18	2	0	2

Table 2: Depth of amblyopia in different groups

Depth of Amblyopia	Group A(n=24)	Group B(n=25)	Group C(n=21)
Mild (≤ 6/18)	2	0	2
Moderate (> 6/18 to ≤ 6/36)	9	10	7
Severe (≥ 6/60)	13	15	12

Table 3: Visual improvement in each groups

Line of improvement	Group A	Group B	Group C
0	14	15	5
1	4	4	6
2	5	4	5
3	1	2	2
>3	0	0	3

Table 4: Responders / Non responders

Groups	Responders	Non – Responder
Group A	10	14
Group B	10	15
Group C	16	5

In group A 8.33% patients were of mild amblyopia 37.5 % patients were of moderate amblyopia and 54.17% patients were of severe amblyopia. In group B patients of moderate and severe amblyopia were 40% and 60%. In group C patients of mild moderate and severe amblyopia were 9.52%, 33.33% and 57.14%

Out of total 70 patients who completed the study, 36 patients (51.43%) showed improvement in their vision for distance; remaining 34 patients (48.57%) were non responders.

Among groups, responders were 41.67%, 40% and 76.2% in group A, B and C respectively. The difference among three groups was statistically significant (p value-0.024 chi-square test). Among groups, nonresponder were 20%, 21.4% and 7.14% in group A,B and C respectively

Side Effects

4 patients (5.71%) complaint of rash due to occlusion given to them. One patient in group C complaint of mild headache which got relieved by medication after two days. Remaining 65 patients developed no complication.

Discussion

Treatment of amblyopia remains a therapeutic

challenge to the ophthalmologists. It has perplexed clinicians over the centuries, both as regards to its diagnosis and treatment. This is further highlighted by the vastness and variety of treatment modalities tried and the research done in this field.

Occlusion remains the gold standard treatment modality of amblyopia. By means of removing the suppression effect of brain cells driven by the sound eye over the brain cells which are involved in processing vision in the amblyopic eye, patching helps in improving the vision. Major failure of occlusion therapy is because of poor compliance due to cosmetic blemish. The other drawbacks like occlusion amblyopia, problems of fusion disruption and increase in angle of deviation, disturbing child's family.

Anisometropia was the most common cause of amblyopia in our study population. It was found to be the cause in 74% followed by combined 17.14%, 4.48% isometropia and strabismus (4.48%). As found by *Attebo et al* and *Pediatric Eye Disease Investigator Group* 54.17% patients of severe amblyopia, 37.14% patients of moderate amblyopia and 5.71% patients of mild amblyopia. Patients of severe amblyopia are more In our study population may be because severe amblyopia comes in notice earlier than mild and moderate amblyopia. The treatment outcomes are influenced by the severity of the amblyopia as stated by *Stewart, Fielder et al.*

Most common type of refractive error found in our study population was hypermetropia (70% of patients) followed by myopia (17.14% of patients) and astigmatism (12.86%). These findings are consistent with finding of *McMullen* who stated that Amblyopia is more common and of a higher degree in patients with anisohypermetropia than in those with anisomyopia. Because when myopia is unequal, the more myopic eye can be used for near work and the less myopic eye for distance. Therefore, unless the myopia is of a high degree, both receive adequate stimulation and amblyopia does not develop.

In our study visual improvement after occlusion therapy (41.67%) was better than spectacle correction alone (18%)This outcome of study is comparable with the Cleary (2000) study who concluded that occlusion is more effective in treatment of amblyopia than spectacle alone.

In our study 40% children (10-19 years) showed improvement in their visual acuity with patching and near vision exercises which is comparable to the study of Ghosh S et al.

In our study 51.43% amblyopic patients of 10-19 years showed improvement in their visual acuity which is comparable to the study of Neela A Patwardhan et al.

In our study we found that on addition of oral citicoline 500mg b.d. to conventional occlusion therapy with near vision exercises in the treatment of amblyopia improves the visual acuity in 77% of patients which is comparable to study of Campos et al [5] who recorded that citicoline was effective in the treatment of amblyopia and statistically significant improvement in visual acuity was found both for the amblyopic and sound eye in 46 of the 50 patients (92%). The improvement remained stable for at least four months.

Similarly Porciatti et al [6] was conducted the study in adult with a mean age of 24.8 years recorded that visual acuity improved 1.4-1.5 lines in the amblyopic eyes and 0.4 in the normal eyes with citicoline.

Ghosh S and Ghosh R [7] conducted study on amblyopic patients, in age group of 10-18 years, reported that 71% of the patients had shown visual improvement with adding drug i.e. citicoline to occlusion and near activities. Our study is comparable to this study in terms of improvement as we also found 76% patients improved by adding citicoline, which was significantly better than remaining two groups (p-o.o2).

Prachee Vasant Pawar et al [8], also studied effectiveness of addition of citicoline to patching in the treatment of amblyopia in the age group of 4-13 years. At the end of five months, in phase 2 showing significantly better improvement in younger and older patients with citicoline along with patching ($p<0.05$).

In our opinion he should have continued drug for some more period as most of the studies had used the drug for longer time, as it may take time for full effect of drug to come.

In our study, we found 41.67 % patients improved in group A, 40% in group B and 76.2% in group C. Difference among groups was statistically significant (p-0.02). Total 51.41% patients of 10-19 years of age group improved with treatment. This is encouraging that those patients who were older enough should also be given a chance to improve. We cannot comment on stability of vision improvement as this requires a longer follow up which we are doing at our institute

Compliance remains the major challenge with occlusion therapy and near exercises and results with these modalities will depend upon compliance of patients. So compliance was given extra importance and carefully monitored

- Regular counselling of patients and parents
- Regular maintenance of a diary by patients/ parents and its regular check up.
- All efforts were done to build up confidence towards otherwise simple looking occlusion method of therapy, thus making compliance and acceptance to achieve a much higher level.

Contrary to this, compliance was much better with the drug therapy. Patient/parents think they will be benefited by medication. Along with this, the side effects associated with the drug are less, as seen in various studies. Therefore this drug is safe to use.

There are few studies using citicholine for amblyopia treatment. Our study is showing promising results with citicoline, which had been shown by most of the previous studies. So it can be concluded that use of citicoline can give better results in amblyopic patients, even in adolescent age group.

Limitations of our study were lesser number of patients and a need of longer follow up period to see whether the gain in vision remains stable or deteriorates in longer follow up period.

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Comparison of Mydriatic Efficacy of Homatropine and Xylocaine as Single and Combined Therapy

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Abstract

Background: Study was conducted to compare efficacy in pupil dilatation between 2% Homatropine(2H) alone and alternate application of 2% Homatropine with 4% Xylocaine(2H/4X) eye drops for easy estimation of refractive error and posterior segment examination. *Methods:* Over 6 months, after obtaining waiver of consent in 100 eyes of 50 patients age between 5-20years (14.26±3.06), one drop of Xylocaine 4% was applied to left eye (study eye). After 60 seconds 1 drop of 2% Homatropine was applied in both right (control eye) and left (study eye). Pupil diameter was measured via transparent scale before instillation of first drop. At every 15 minutes interval, pupillary size was measured and subsequent instillations were done, upto one hour. *Results:* There was a statistical significant difference in pupil diameter between eyes dilated with 2H/4X and 2H alone at 30-60minutes ($p<0.001$). 31 patients (62%) developed maximum pupillary dilatation of (7.42±0.84) in left eye by 45minutes, while only 4 patients (8%) in right eye. Mean dilatation at 60 minutes in study eye was 7.94±0.24 but in control eye was 7.00±0.83 with $p<0.001$. *Conclusion:* Combination of 2H/4X potentiates mydriatic effect produced by Homatropine alone causing quicker onset of action, increases patient comfort level by reducing stinging effect of Homatropine and reducing the chances of side effects of Homatropine like delirium, hallucination, dry mouth by reducing the number of drop instillations. So, combination of 2H/4X can reduce patient's waiting time in OPD and quicker examination of interior of eye and refractive error with ease.

Keywords: Homatropine; Mydriasis; Xylocaine.

Introduction

Pupillary dilatation or mydriasis is of great significance in screening of various ophthalmological conditions [1]. Cycloplegia is needed for assessing the accommodation and obtaining accurate refraction in young children who have strong accommodation; in all children with tropias, hyperopia, pseudomyopia etc. The objectivity & consistency of cycloplegic refraction is unbeatable. The incidental effect of cycloplegia is mydriasis, necessary for detailed examination of lens, vitreous & fundus examination in all patients [2]. The factors which influence mydriasis are pupillary hippus, iris pigmentation, emotional status, diseases- local & systemic, drugs- systemic & topical ophthalmic medications [3]. The ability & magnitude of agent for producing mydriasis depends on balance between sphincter and radial muscle of pupil which are controlled by parasympathetic and sympathetic nervous system respectively. Loads of studies have investigated the time course and maximal mydriasis for different topical drugs in these categories in an

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effort to look which drug provide a quick, adequate dilatation with the least potential for untoward side effects in patients [4-6].

Parasymaptholytic and sympathomimetic drops are commonly used for pupil dilatation in clinical settings routinely [7]. An ideal mydriatic will cause quicker onset of dilatation with quick recovery but lesser side effects. Additionally for cataract surgery, an adequate, sufficient and sustained dilatation is mandatory. In general, the cycloplegic drugs which causes both mydriasis & cycloplegia takes longer time to act. It has been documented that in light irides patients, drugs takes shorter time course for dilatation, which speeds up in dark irides patients when drugs with two different mechanism of action are combined [7].

Homatropine is an anticholinergic agent acting as an antagonist of muscarinic acetylcholine receptors, causing parasympatholytic effect. The cycloplegic effect need not necessarily correlate with mydriatic effect.

Refractive error is most common condition in ophthalmological practice, which is detected by instilling cycloplegic-mydriatic drugs in conjunctival sac to achieve cycloplegia & pupillary dilation. Most of cycloplegic-mydriatic drugs take variable time for onset of action and have irritant effect topically, causing patient discomfort. Also they are instilled frequently, often more than necessary, usually by the paramedical ophthalmic assistants. This may cause side effects & affect patient compliance adversely and also prolongs the time spent by the patient in OPD.

Xylocaine is a local anaesthetic agent which has membrane stabilizing effect, thereby improving the effect of the topical drug, hasten the time of action and thereby probably reduce the frequency of instillations.

This study is an effort to study maximal or optimal mydriasis irrespective of cycloplegic effect. Mydriatic examination has to be carried out by the Ophthalmologist, while refraction after onset of cycloplegia can be carried out by the Optometrist. The onset and amount of cycloplegia was not the purview of this study.

So this study aims to compare the mydriatic efficacy of homatropine alone vs combination of homatropine and xylocaine in patients attending Ophthalmology OPD at Sri Siddhartha Medical College and Hospital, Tumkur. This will be achieved by:

1. Considering Right eye as the control eye(A) & Left as the test eye(B).
2. Comparing onset of action–mydriasis.
3. Comparing time of peak mydriasis.
4. Comparing frequency of drug instillation.
5. Studying the discomfort experienced in patients.

Methods

This study was conducted in outpatient department of Ophthalmology in SSMC Hospital and Research centre in patients requiring routine testing of the refractive error.

This case-control study was an observational clinical study, consisting of total 100 eyes of 50 patients aged between 5-20 years attending Ophthalmology outpatient department in SSMC, Tumkur, for routine refraction. The study was approved by the Institutional ethics committee & a waiver of informed consent was taken, as the procedure is a part of routine Ophthalmic evaluation for refractive error.

After obtaining verbal consent from parents and assent from patient, their simple random sampling was done and their primary demographic data was noted. Brief history was taken & initial examination of both eyes with diffuse light was done. Snellen's Visual acuity was recorded. First baseline pupil size was recorded in both eyes using transparent scale as 0 minutes. Then one drop of Xylocaine 4% was instilled in left eye (study eye), after 60 seconds or after the subsidence of stinging sensation, 1 drop of 2% Homatropine was instilled in both eyes. So, the drug regimen assigned consist of instillation of Homatropine 2% in right eye(A)-control eye & Homatropine 2% with Xylocaine 4% in left eye(B)-study eye, noting the time of instillation. A 15 minute interval was given between subsequent pupillary measurement and administration of Homatropine drops upto one hour.

Exclusion Criteria Included

1. History of intra-ocular inflammation,
2. History of any intra-ocular procedure/ surgery,
3. Use of any topical medication,
4. History of juvenile diabetes,
5. Patient unable to comprehend/ assent.
6. Uncooperative child.

Data is obtained by recording the pupillary size using transparent scale having grading from 0-15mm. It was recorded by the same observer at the

eye level of the patient, avoiding any parallax error, prior to instillation of eye drops, then every 15 minutes, for 1 hour. All the drops were instilled into the inferior fornix by gently pulling the lower lid down & the patients were instructed to keep their eyes closed. They were also instructed to keep their head tilted backwards, resting on the back of the seat. At the completion of the process, the patient was asked to give a comparison of the discomfort/any unpleasant sensation between the two eyes.

The difference in the average duration of Homatropine alone(A) and Homatropine with Xylocaine(B) in pupil dilatation was tested for its statistical significance by mean ± standard deviation. Student t test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale within each group. Significance is assessed at 5% level of significance

Results

A total of 100 eyes of 50 patients were enrolled in this study with left eye as study eye(B) and right eye as control eye(A). (Table 1, Figure 1).

Patient age ranged from 5 years to 20 years, with the mean ± standard deviation (SD) of 14.26±3.06 (Table 2, Figure 2).

Twenty-five patients were male and twenty-five were females (Table 3, Figure 3). So there was no significant difference in baseline gender distribution.

Pupil size assessment of maximum-minimum size at 0, 20, 30, 45, 60 minutes in both study and control eye in (Table 4, Figure 4) showing statistical significant difference in pupil size ($p<0.001$) at all intervals.

In all patients, baseline pupil size at 0 minute was 2-3mm. In most patients 47 out of 50 (94%) pupil started dilating from baseline at 20minutes in study eye-B, while only 7 out of 50 (14%) in control eye-A.

In this study maximum pupillary size was defined as 8mm size measured with transparent scale. 31 out of 50 patients in study eye (62%) developed maximum pupillary size in 45 minutes while only 4 out of 50 patients (8%) in control eye ($p<0.001$). Total of 47 out of 50 patients(94%) developed 8mm dilatation in study eye while only 17 out of 50 patients (34%) in control eye($p<0.001$) in 60minutes (Table 5).

Comparison of pupil size of study and control eye at 0, 20, 30, 45, 60 minutes (Table 6, Figure 5a) demonstrates that mydriasis produced when combining Homatropine with Xylocaine (B) was significant ($p<0.001$) at 20, 30, 45 and 60minutes.

Figure 5b showing gradual increase in pupil size in study group (B) with time from baseline to 60minutes with most increase at 30-45minute interval while in control group increase in pupil size starts after 20minutes.

Also 45 out of 50 (90%) patients reported that despite initial stinging, the Left eye (B) felt comfortable at completion of the procedure.

Table 1: Eye Involved of patients studied

Eye Involved	No. of Eyes	%
Left Eye	50	50.0
Right Eye	50	50.0
Total	100	100.0

Table 2: Age distribution of patients studied

Age in years	No. of patients	%
<10	3	6.0
10-15	28	56.0
16-20	19	38.0
Total	50	100.0

Mean ± SD: 14.26±3.06

Table 3: Gender distribution of patients studied

Gender	No. of patients	%
Female	25	50.0
Male	25	50.0
Total	50	100.0

Table 4: Pupil size : An assessment at 0 min, 20 min , 30 min, 45 min and 60 min

Pupil Size	Min-Max	Mean ± SD	difference	t value	P value
0 min	2.00-2.00	2.00±0.00	-	-	-
20 min	2.00-5.00	2.85±0.86	-0.850	-9.916	<0.001**
30 min	3.00-7.00	4.54±1.01	-2.540	-25.167	<0.001**
45 min	5.00-8.00	6.50±1.25	-4.500	-35.964	<0.001**
60 min	6.00-8.00	7.47±0.77	-5.470	-70.910	<0.001**

** Strongly significant (P value: P≤0.01)

Table 5: Time taken to achieve 8mm dilatation

Time(min)	Group-B	Group-A
30	0	0
45	31 (62)	4 (8)
60	47 (94)	17 (34)

Table 6: Pupil size: A Comparison between study group-B and control group-A (Left eye Vs Right eye)

Pupil Size	Group-B	Group-A	t value	P value
0 min	2.00±0.00	2.00±0.00	-	-
20 min	3.52±0.61	2.18±0.44	15.983	<0.001**
30 min	5.28±0.76	3.80±0.61	16.188	<0.001**
45 min	7.42±0.84	5.58±0.86	13.324	<0.001**
60 min	7.94±0.24	7.00±0.83	8.122	<0.001**

** Strongly significant (P value: P≤0.01)

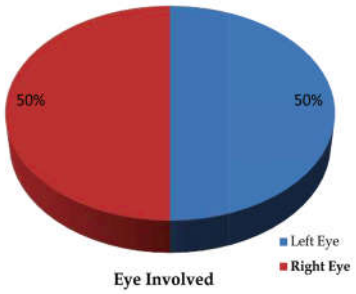

Fig. 1: Eye Involved of patients studied

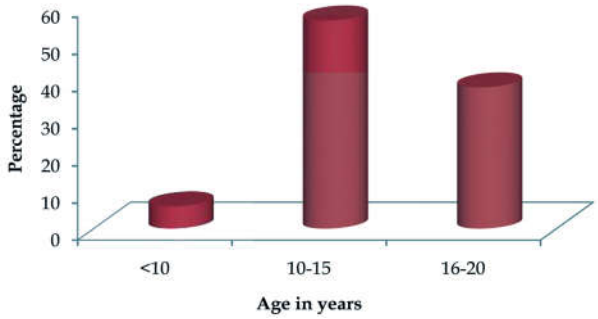

Fig. 2: Age distribution of patients studied

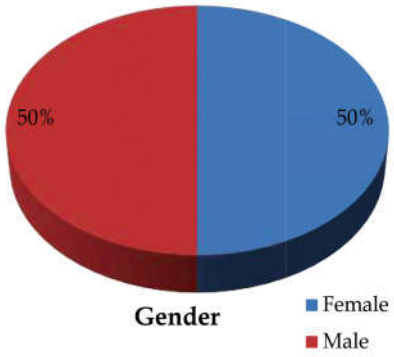

Fig. 3: Gender distribution of patients studied

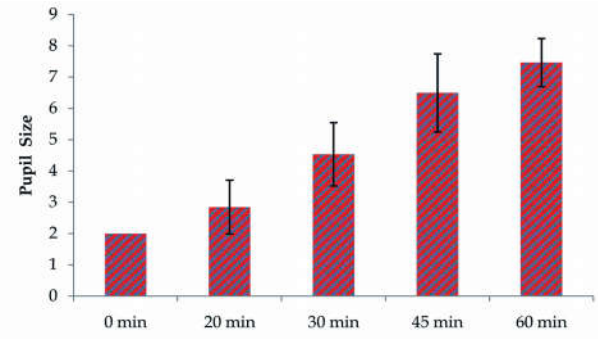

Fig. 4: Pupil size: An assessment at 0 min, 20 min , 30 min, 45 min and 60 min

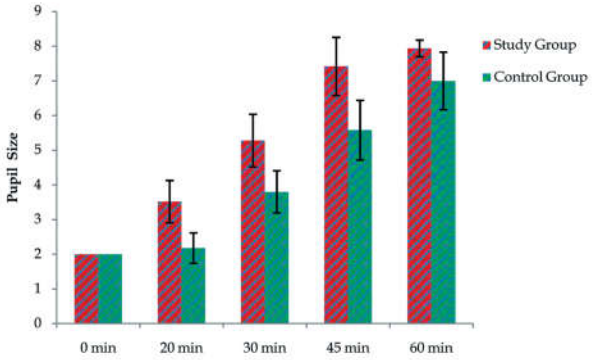

Fig. 5a: Pupil size: A Comparison between Group B and Group A (Left eye-study Vs Right eye- control)

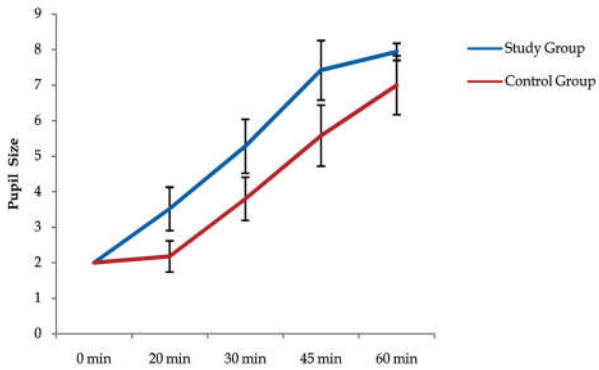

Fig. 5b: Pupil size: A Comparison between Group B and Group A (Left eye-study Vs Right eye- control)

Discussion

Globally visual impairment due to uncorrected refractive error is 158million [8]. Among 5-15years old children, uncorrected refractive error is main cause of visual impairment [9]. So,comprehensive screening and refracting children in school going age group is a common, essential clinical test in Ophthalmology. Use of an effective, solo or combination of mydriatic and cycloplegic eye drops can facilitate this procedure. Compliance can be poor due to the time taken for the pupillary dilatation and the discomfort associated with the instillation of eye drops.

There is no literature till date which showed effectiveness of mydriasis or pupil dilatation on combining local anaesthetic with Homatropine. So,

present study was done to show if prior application of Xylocaine augments the mydriatic efficacy of Homatropine.

Pupil is a dynamic structure whose size is controlled by sympathetic & parasympathetic nervous system. Parasympathetic regulation dominates over sympathetic effects in control of pupil size of eye [10]. Parasympatholytic & sympathomimetic drugs are main class of drugs used as mydriatic & cycloplegics in day to day practice to screen for refractive error, cataract surgery, photocoagulation procedures, detailed examination of fundus, relieve ciliary spasm in acute inflammation & to prevent formation of posterior synechiae in uveitis.

Homatropine in the form of Homatropine hydrobromide is colourless crystal, can be used as mydriatic & cycloplegic drug [11]. It is available in concentration of 0.25%, 0.5% as mydriatic & 1%, 2%, 5% for cycloplegics [11]. It acts by inhibiting acetylcholine action leading to paralysis of sphincter pupillae & unopposed adrenergic innervations of dilator pupillae leading to dilatation of pupil.

The onset of mydriasis & cycloplegia has variable latency, 30- 60 minutes. Siu et al (1999) reported that prior application of local anaesthetic could shorten the time to full cycloplegia for Chinese patients with dark irides [12].

Local anaesthetic acts by inhibiting rate of corneal epithelial cell migration & decreasing permeability of chloride channels thus blocking nerve impulse transmission & destroying superficial epithelial microvilli. Thus potentiates pupillary dilatation induced by routinely used mydriatics [13].

An important observation made in this study was, the shape of pupil on dilatation with homatropine. This was found to be circular unlike, vertically oval pupil on using sympathomimetic agents for dilatation [14].

There is no literature till date which showed effectiveness of mydriasis or pupil dilatation on combining local anaesthetic with homatropine. So, present study was done to show if prior application of one drop of Xylocaine augments the mydriatic efficacy of homatropine.

In using more than one drug, time gap between drops may affect amount of drug absorption in the eye. Initial drug used requires some contact time for ocular penetration. Early instillation of second drug may dilute or washout the first drug from cul-de-sac, thereby, reducing the chances of first drug penetration into the eye. So here in this study a time gap of 60 seconds was allowed between instillation of Xylocaine followed by Homatropine eye drops.

It was observed in this study that Xylocaine potentiates mydriatic efficacy of Homatropine by decreasing time of onset, number of drop instillation & causes effective pupil dilatation. Also, it gave better comfort to the patients despite the initial irritation.

So, it is believed in present study that combined use of 2% homatropine with 4% xylocaine is more effective as mydriatic than 2% homatropine alone.

Regarding concern for limitation of current study was that measurement of pupil size in our study was conducted in bright light using transparent scale. The pupillary size is only an apparent measurement as it is visualized through the cornea. Hence, magnification factor has to be kept in mind. Randomised trials with larger sample size may be required for confirmation. Also, 2% topical Xylocaine may be tried.

Conclusion

Combination of 2% homatropine & 4% xylocaine (2H/4X) potentiates mydriatic effect produced by homatropine alone causing quicker onset of action, increases patient comfort level by reducing stinging effect of homatropine and reducing the chances of side effects of homatropine like delirium, hallucination, dry mouth by reducing the number of drop instillations. So, combination of 2H/4X can reduce patient's waiting time in OPD and quicker examination of interior of eye and refractive error with ease.

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Original Article

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Knowledge and Awareness of Glaucoma in Final year Medical Students

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Abstract

Background: Glaucoma is the leading cause of untreatable blindness throughout the world. Being a multi factorial optic neuropathy, early diagnosis and prompt treatment is the only vision saving strategy. This requires referral for glaucoma screening by a family physician or any doctor with a high index of suspicion, based on basic knowledge of Glaucoma, a prerequisite for all the medical practitioners. Glaucoma is routinely taught as a part of Ophthalmology curriculum during first phase of Clinical curriculum in the final year of MBBS. The aim of this study is to determine the knowledge of the future primary health care givers. A questionnaire about glaucoma in administered to final year MBBS students of Sri Siddhartha Medical College of Tumkur, Karnataka: the students who have completed Ophthalmology curriculum. The students are expected to be aware of the basic facts of this potentially blinding disease Glaucoma. *Material and Methods:* A total of 50 student volunteers studying in final year MBBS took the survey questionnaire, without revealing their identity. *Results:* The students were found to be aware with a fair knowledge about the disease entity.

Keywords: Awareness; Knowledge; Glaucoma; Medical College.

Introduction

Glaucoma is the second cause of blindness worldwide and the leading cause of irreversible blindness [1]. The most effective strategy to bring down the prevalence is early detection of Primary open angle glaucoma & thereby prevent blindness.

Awareness among primary care physicians and among public , about this almost silent disease plays a pivotal role in bringing the high risk patients to the ophthalmologists, and hence, limiting the visual disability. Spreading knowledge about the disease not only helps to prevent blindness but also reduces the economic burden of the disease [2].

The incidence of glaucoma ranges between 6.5 to 7.5% in different parts of the world. With such a high incidence of a blinding disease, early detection of glaucoma is essential to prevent blindness [3,4]. Increased awareness about glaucoma will increase case detection and will thereby reduce blindness due to glaucoma.

Social perceptions of health have changed globally; there is an impetus to move towards good health by using resources for preventive measures. Governmental agencies and several non-governmental organizations are looking to reduce the risk factors for ocular diseases, educate the public to understand the need to improve their health status, and are teaching individuals how to increase their own ability to maintain well being [5].

Published evidence indicates that late diagnosis

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of Primary open angle glaucoma is an important risk factor for subsequent blindness and is associated with poor knowledge about the condition [6].

The referral source is an important contributing factor for early diagnosis. Patients referred from optometrists with a diagnosis of glaucoma are more likely to be in the early stages of the disease [7].

Referral patterns in India are quite different from the West. One third of those who become blind due to glaucoma had become visually impaired even before they had sought medical attention for their eyes [8,9,10].

Blindness due to glaucoma can be curbed to a certain extent by educating the masses about the condition, and thereby influencing at risk individuals to participate in regular ophthalmic care [11]. Glaucoma is taught as an integral part of ophthalmology curriculum for undergraduates. Medical graduates are expected to be equipped with basic knowledge of Glaucoma and contribute to the preventive strategy by advising glaucoma screening. This survey is conducted to know their awareness of Glaucoma. It is an important indicator of the awareness among future healthcare providers.

Materials and Methods

A Survey was conducted by Department of Ophthalmology Sri Siddhartha Medical College, Tumkur. Survey composed of 50 student volunteers studying in final year MBBS who answered a structured, validated questionnaire. The survey was blinded: the identity of the volunteer was kept anonymous. The awareness was categorised on the basis of depth of knowledge they had about the Glaucoma.

Respondents answered questions pertaining to risk factors for glaucoma, description of symptoms and treatment aspects. The first few questions comprised of basic awareness about the disease. Categories of questions varied from open ended questions to objective questions with multiple correct answers, to come to a more accurate assessment about the knowledge of the disease entity.

Students were asked to describe Glaucoma in brief by an open ended question. Open ended question was also used to assess the knowledge of basic information of Glaucoma like the types of Glaucoma. Most of the questions were multiple response types : for example, where the volunteers were asked to select important risk factors and treatment options from the given choices.

The following questions were on its manifestation and type of visual field damage. The risk factor options were presented in the questionnaire namely, increased intraocular pressure (IOP), obesity, steroid use, family history and diabetes.

Glaucoma knowledge was assessed by questions that comprised of details of familial predisposition, and type of vision loss. It was compared with cataract so as to know if students had clear idea and comparison between both the disease entities. All the answer sheets were assessed individually. Multiple answers were taken into consideration and the idea about awareness and knowledge was made.

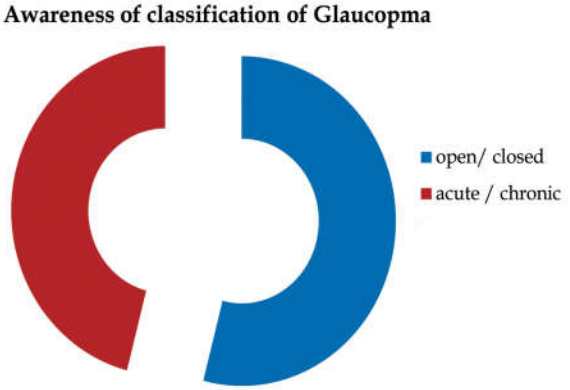
Defining knowledge levels of glaucoma: A student volunteer was considered to have good knowledge, if he/she was able to identify the risk factors for glaucoma such as increased IOP, family history, and steroid use and was further able to meaningfully describe the condition and identify therapies for glaucoma such as medical or surgical.

Fair knowledge was qualified if at least two of the risk factors were identified and a description on at least one treatment option was correctly provided.

Student volunteers were considered to have poor knowledge, if they were unable to identify even a single risk factor or treatment option for glaucoma.

Observations

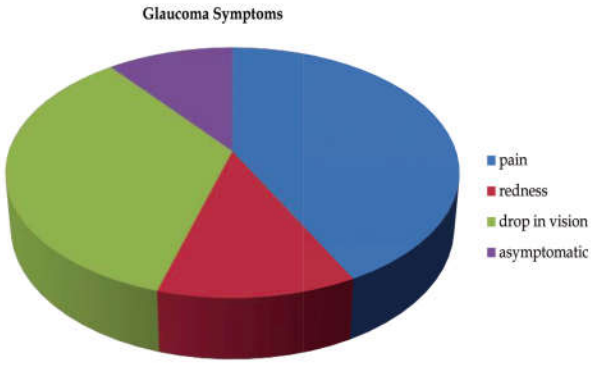
Out of 50 subjects to whom the questionnaire was administered, all the students (100%) answered it. Out of 50 students , 27 students classified glaucoma as open or closed angle while 23 described it on the onset of presentation - as acute and chronic.



On asking about manifestation of glaucoma, maximum students thought it manifests with pain and reduced vision while only 16% thought it manifests with reduced vision.

How does glaucoma manifest?

- With pain 28 (56%)
- With redness 8 (16%)
- With reduced vision 23(46%)
- Without any symptoms 7 (14%)



50% of the students thought that the visual damage due to glaucoma is irreversible while 38% thought it was reversible and 16% thought it was transient.

Glaucomatous visual damage is-

Transient	8 (16%)
Reversible	19(38%)
Irreversible	25(50%)
Recurrent	0%

50% of the students thought the end result of glaucoma is constriction of visual field, optic neuropathy and venous occlusion however 4% thought glaucoma results in none of these.

Glaucoma causes-

Field defects	20 (40%)
Optic neuropathy	2 (4%)
Venous occlusion	2 (4%)
All of the above	25 (50%)
None of the above	2 (4%)

24 out of 50 students i.e 48% thought medical treatment is the best form of treatment while 17 (34%) thought surgical treatment was superior, however 11 students (22%) thought the treatment modality was variable.

Best treatment for glaucoma

Medical treatment	24 (48%)
Surgical treatment	17 (34%)
Variable	11 (22%)
Not available	1 (2%)

34 (68%) students had awareness of glaucoma because they were taught regarding the subject in their curriculum, 18 (36%) had gained knowledge from different books, journals and magazines while the source of knowledge of 24% was positive family history.

Mode of information-

Medical personnel	34(68%)
Internet	2(4%)
Family history of glaucoma	12(24%)
Books/journals/magazines	18(36%)

Maximum students i.e 76% thought the possible risk factor for glaucoma is increased intra-ocular pressure while 48% thought positive family history and according to 46% of them long term administration of steroid was a possibility. 16% and 2% thought diabetes and obesity as a probable risk factor.

Possible risk factors for glaucoma-

Obesity	2 (4%)
Increased intra ocular pressure	38 (76%)
Steroids	23(46%)
Chronic smoking and alcohol intake	12 (24%)
Family history of glaucoma	24(48%)
Diabetes	16(32%)
None of the above	0%

For the medical management of primary open angle glaucoma, maximum 84% students thought beta blocker to be the drug of choice followed by 38% to PG analogues while 8% thought MAO inhibitor to be the effective drug in glaucoma.

Drugs used in glaucoma

CAI 6	(12%)
Beta blockers	42(84%)
MAOI	4(8%)
PG analogues	19(38%)

When questions in depth regarding glaucoma and cataract, 50% students confused thinking both come in the same disease spectrum and 20% believed glaucoma results from mature cataract and large number of them i.e 42% thought it to be a result of pressure damage to the nerve. 6% did not know the consequence of untreated glaucoma while 80% thought it would lead to slow irreversible loss of vision.

Disscussion

Awareness and knowledge of a disease are important determinants of health-seeking behavior of individuals. Community health workers and doctors working at remote villages, who are in charge of the primary health care centers and health posts are largely responsible for preventive and curative health care in rural areas. Glaucoma is often asymptomatic and detected very late, at the stage of irreversible visual loss. The primary care givers need to counsel and guide for timely screening & referral. Awareness among medical graduates, who may eventually be the primary care givers or specialists play a vital role in creating awareness and in reducing the burden of blindness.

Our study showed that most of the respondents knew that glaucoma is caused by high pressure in the eyes, but nearly half of them thought that it is a painful disease. This misconception may prove costly since the painless nature of chronic open-angle glaucoma is one of the factors responsible for late presentation. Furthermore, students were found to mistake glaucoma with cataract by not appreciating that blindness from glaucoma is irreversible.

A small percentage of them were also found not to have clarity between the drugs causing Glaucoma and the ones used for treatment. The irreversibility of fields in open angle glaucoma was a matter of confusion.

Conclusion

Majority of students had fair knowledge about the disease i.e from the risk factors, manifestation, treatment and sequelae of this visually fatal disease. Awareness was high but knowledge was average, and a certain amount of confusion prevailed regarding its clinical presentation.

The clinical curricular teaching should emphasize on Primary and secondary prevention. The importance of Glaucoma screening should be emphasized repeatedly so that a specialist, be it a Physician, Diabetologist or any doctor for that matter should be able to have basic working knowledge of Glaucoma, thereby referring for early diagnosis and prompt management by the Ophthalmologist and reducing the burden of Glaucoma blindness.

This calls for renewed efforts from teachers in medical universities to reinforce teaching methodology with greater focus on Glaucoma , focusing on screening and early detection.

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How Anti-Vegfs have Changed the Management of Retinal Diseases

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Abstract

The discovery of Vascular Endothelial Growth Factors (VEGF) and its role in retinal diseases has provided insight in the retinal diseases and as an example of translational medicine, invention of anti-VEGF molecules has provided new modality of therapy for retinal diseases. This review article comments on the utility and the changes in the therapy of retinal diseases brought up by the availability and use of these Anti-VEGF molecules.

Keywords: Anti-VEGF, VEGF, Diabetic retinopathy, Eale's Disease, Retinoblastoma, Retinopathy of Prematurity.

In last decade it has been obvious by various experimental and clinical studies that Vascular Endothelial Growth Factor (VEGF) is one of the major cytokines which play an important role in inflammatory and ischemic processes in the eye. VEGF was first identified in guinea pigs, hamsters, and mice by Senger et al. in 1983 [1]. It was purified and cloned by Ferrara and Henzel in 1989 [2].

It is a signal protein produced by cells that stimulates vasculogenesis and angiogenesis. It is part of the system that restores the oxygen supply to tissues when blood circulation is inadequate such as in hypoxic conditions [3]. It has an important role in the normal development, maintenance and repair of vasculature system, however over expression of various isoforms and their role has been identified in various diseases in breast cancer, rheumatoid arthritis, angiosarcoma and colon cancer.

It is also known that altering the available VEGF can be helpful in management of cancer. Solid cancers cannot grow beyond a limited size without an adequate blood supply; cancers that can express VEGF are able to grow and metastasize.

Over expression of VEGF can cause vascular disease in the retina of the eye and other parts of the body. Drugs which can neutralize the available VEGF have been designed to treat the related conditions. Although there are many anti-VEGF described in the literature like Bevacizumab, Ranibizumab, Pegaptanib, Anecortave acetate, VEGF-trap, Squalamine lactate, Combretastatin A4 Prodrug, AdPEDF, SiRNA, Cand5, TG100801, the most studied and frequently used are Bevacizumab (Avastin; Genentech, Inc., CA) Ranibizumab (Lucentis; Genentech, Inc., CA).

The availability of these new class of molecules have made an paradigm shift in the management of various eye diseases. The article will discuss the change in the intervention strategy in these disease after the advent of Anti-VEGF molecules.

Wet ARMD (Age Related Macular Degeneration)/ Choroidal CNVM (Choroidal NeoVascular Membrane).

Azad et al. were the first to publish the results of Bevacizumab for treating wet AMD in the Indian population in 2008 documenting improved vision in all AMD lesion types[4]. Before that the mainstay of treatment was Antioxidants as preventive modality and LASERs to treat aggressive and obvious

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CNVM with associated permanent central scotoma. The Photodynamic Therapy (PDT) helped in cases with occult CNVM and resulted in lesser collateral damage as seen with direct photocoagulation.

Overall the aim of these pre-AntiVEGF therapies was to stabilize future progression of disease but no improvement could be anticipated. With the popular use of Anti-VEGF it was possible to treat wet ARMD with an anticipation of improving and stabilizing the central vision with no collateral damage whatsoever. in this context the use of anti-VEGF for AMD in India, most would use Bevacizumab monotherapy on a loading dose followed by PRN dosing. Ranibizumab may be preferred in affordable patients and in poor-responders/those developing tachyphylaxis to Bevacizumab [5].

Diabetic Retinopathy

Diabetic retinopathy was being treated with Pan Retinal Photocoagulation (PRP) since the publication of DRS (Diabetic Retinopathy Study) and subsequently ETDRS (Early Treatment Diabetic Retinopathy Study) [6] defined the roles of PRP and Macular Grid laser for PDR (Proliferative Diabetic Retinopathy) and macular oedema respectively.

Introduction of steroids for management of PDR and macular oedema changed the scenario of management of diabetic retinopathy in a way that the macular grid laser went out of practice though soon it was realized that the long term effects of Steroids resulted in poorer visual outcome when compared to laser therapy because of associated adverse effects of long acting steroids like cataract and glaucoma [7].

Anti-VEGFs provided better outcomes in terms of visual gain and reduction in retinal thickness when compared to LASERs, and this was true for both Ranibizumab [8] and Bevacizumab [9]. In the short term, intravitreal Anti-VEGF result in greater VA and retinal thickening outcomes when compared to LASERs. However, these agents require maintenance with repeated injections and also have longer-term associated side effects and higher costs [10].

Another use of Anti-VEGF agents have been in the PDR where Vitrectomy is indicated for traction, ERM (Epi-Retinal Membrane), or repeated vitreous haemorrhages. In these cases prior injection of Anti-VEGF agents has resulted in better outcome in terms of visual gains and lower incidence of repeat haemorrhages [11].

Eale's Disease

In Eales disease the peripheral retinal ischemia results into excessive secretion of angiogenic factors [12]which promote neovascularisation and subsequent complications like vitreous haemorrhage, anterio-posterior traction, tractional retinal detachment and combined retinal detachment [13]. Peripheral ischemic areas as evident on clinical evaluation and angiography is treated by LASER photocoagulation to ablate the relevant retina and reduce the angiogenic factors. No this is accomplished by use of anti-VEGF injections and has promising results [14]. Though it is also important to note that the anti-VEGF agents cause aggravation of traction which is very common in these patients [15].

Retinal Venous Occlusions

Retinal vein occlusions are a group of vascular occlusions comprising of central retinal vein occlusion, hemi retinal vein occlusion and branch retinal vein occlusion. The vision loss is related to immediate ischemia, macular oedema, and subsequent neo-vascularisation and its complication comprising of vitreous haemorrhage, epi-retinal membranes causing Vitreo-macular traction and glaucoma.

Clinical trials have shown benefits of LASER to the affected ischemic areas by reducing the incidence of neovascularisation and reducing oedema. Intravitreal steroids and anti-VEGF agents have been Various trials have conclusively studied the benefits of anti-VEGF given intra-vitreally in these patients of Retinal vein occlusion diseases [16].

The macular oedema in CRVO and BRVO responds to intravitreal therapy of steroids and various anti-VEGF agents. Best visual acuity results at 1 year are found after aflibercept 2 mg and Bevacizumab 1.25 mg in CRVO, and Ranibizumab 0.5 mg in BRVO. The CRUISE (Ranibizumab for the Treatment of Macular Oedema After Central Retinal Vein Occlusion Study: Evaluation of Efficacy and Safety) study [17] and The BRAVO (Ranibizumab for the Treatment of Macular Oedema Following Branch Retinal Vein Occlusion: Evaluation of Efficacy and Safety) study [18] reported low incidence of cataract progression and no incidence of cataract surgery or endophthalmitis.

Neo-Vascular Glaucoma (NVG) in the patients of retinal venous occlusions has poor prognosis and the treatment options are limited to aggressive drug therapy, shunt surgery, cyclodestructive procedures and photocoagulation. Each one having its limitation in terms of outcome and patient acceptability. The use of anti-VEGF agents has proven to be of value in NVG by inducing regression of anterior segment

ischemia and controlling of Intra Ocular Pressure (IOP) [19].

Retinopathy of Prematurity

Retinopathy of prematurity (ROP) is a group of intraocular finding due to aberrant retinal vascularisation due to ischemia in the developing neonate eye. The vision loss associated with ROP is due to retinal detachment due to traction caused by the aberrant vascularisation. The treatment as per STOP ROP trial is to treat the peripheral un-vascularised retina by LASER photocoagulation so as to anchor the retinal tissue and to reduce the load of angiogenic factors.

The first multicenter randomized, controlled trial was the BEAT-ROP study which demonstrated an advantage of intravitreal Bevacizumab over laser therapy for zone I or zone II with stage 3+ ROP by improving structural outcomes, decreasing recurrence, and allowing continued development of peripheral retina [20].Though there is still controversy about the short term concerns like recurrences, endophthalmitis, choroidal rupture, retinal haemorrhage, and endophthalmitis. The long term complications and systemic adverse effects are not known due to recent application of anti-VEGF in this disease [21].

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Case Report

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Diagnosis and Management of a Case of Charles Bonnet Syndrome

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Abstract

Charles Bonnet syndrome is among one of the clinical conditions which are not very commonly encountered. Visual hallucinations generally found along with it are complex but interesting. Elderly persons with visual impairment are more prone to develop this syndrome. But pieces of literature have shown that impairment of visual function might not be always accompanying with it. Here we are reporting a case of Charles Bonnet syndrome that had no gross visual abnormality.

Keywords: Charles Bonnet Syndrome; Hallucination; Occipital Cortex; Olanzapine.

Introduction

Charles bonnet syndrome is a clinical condition of having complex visual hallucination in a non-psychotic person, generally due to a defect in the visual pathway [1,3]. These hallucinations are also termed as visual release hallucinations [1,2].This syndrome was first described by Charles Bonnet in 1760 in grandfather who was suffering from cataract. Later on, in 1967 George de Morsier, labeled the condition as Charles Bonnet syndrome [3]. Dysfunction of the visual pathway starting from the retina to visual cortex is the sole pathophysiology behind it [1,3]. Studies have reported that 10- 40% of the older population (more than 65 years) are found to be having Charles bonnet syndrome [3]. Teunisse et al have proposed some diagnostic criteria for this syndrome. Which are as follows [4].

a. At least one complex visual hallucination within the past 4 weeks
b. A period between the first and the last hallucination exceeding 4 weeks
c. Full or partial retention of insight into the unreal nature of the hallucinations
d. The absence of hallucinations in other sensory modalities
d. Absence of delusions

Here we are reporting a case of Charles bonnet syndrome who had mild visual impairment on ophthalmological examination.

Case History

A 75 years old man presented to our Out Patient Department with a chief complaint of seeing unusual things which are not seen by others for the last 3 months. On detailed enquiry, he revealed that he would see snakes crawling on his bed, especially during evening hours. Out of fearfulness, he would call his family members to rescue him. Aside from that, he used to see a doctor was about to perform an operation but suddenly he got disappeared.

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Following that our patient repeatedly would search for the doctor, even he used to call his family member to search for the doctor. After repeated assurance from the family members, his unusual behaviour was persisting. He was seeing these unusual events continuously for the last 3 months. Apart from this, our patient was not having any other features of psychosis. His past history of physical and mental illness did not uncover any abnormality. There was no history of taking any medications and psychoactive substances. Premorbidly he was well adjusted in nature. On mental status examination, he was co operative, alert, anxious, visual hallucination which was of the complex in nature, persisting, independent of his will and mood congruent. His cognitive function, judgment, and insight were intact. Subsequently, an ophthalmological examination was sought which had revealed no major abnormality except decreased visual acuity, which can be explained by his age-related changes. Looking at the nature of the hallucination and absence of any other psychotic feature and absence of any ophthalmological abnormality. He was started on a low dose of antipsychotic (Olanzapine 5 mg). On subsequent visits, he was found to be better.

Discussion

Charles bonnet syndrome is often found in elderly people with visual impairment [5,6,7]. Macular degeneration of retina has been reported frequently to be associated with it [1,5,6,7]. Hallucinations are generally visual in nature [1]. Involvement of other senses is generally not seen. Exact etiology of Charles bonnet syndrome is not known, although defect in visual pathway starting from lens to the occipital cortex are generally seen to be associated with it [1-5,7]. Ohare et al had described development of complex visual hallucination in a patient with Retinitis Pigmentosa [5]. Makino also had described Charles bonnet syndrome in a 88 year old women, who was also harboring Retinitis Pigmentosa [6]. Gorgens et al reported an 80 years old lady with Charles bonnet syndrome who was suffering from degeneration of macular region of the retina [7]. Neurophysiology behind this syndrome has not been clearly explained. But. Burke has stated that damage to the visual pathway cause deafferentation, leading to disinhibition and spontaneous firing of the visual cortex [8]. Our patient also had visual hallucination which was persisting and complex in nature. But on ophthalmological assessment, he was not found to be having any abnormality of the visual tract. He only had decreased visual acuity which can be explained enough by his age-related changes. Bhatia et al also had a similar finding like our case in which they described complex visual hallucination in a person with no major abnormality of the visual tract [1]. The motivation behind highlighting our case is the variety of the presentation of this syndrome. Although a lot of literature are supporting the association of major visual anomaly, it might be developed in person with normal or minor visual problems.

Conflicts of Interest

NIL

Financial Disclosures

NIL

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[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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