CLINICAL PRESENTATION OF LENS INDUCED GLAUCOMA: STUDY OF EPIDEMIOLOGY, DURATION OF SYMPTOMS, INTRAOCULAR PRESSURE AND VISUAL ACUITY

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ABSTRACT: BACKGROUND: Lens Induced Glaucoma is a common cause of ocular morbidity. OBJECTIVES: Our study was to know the Epidemiological factors, Duration of Symptoms, Visual Acuity and Intraocular Pressure in the clinical Presentation of Lens Induced Glaucoma. MATERIALS AND METHODS: This was a tertiary hospital based prospective study in the department of Glaucoma, Sarojini Devi Eye Hospital and Regional Institute of Ophthalmology (RIO), Osmania Medical College, Hyderabad over a period from March 2015 to August 2015. 50 Patients clinically diagnosed as Lens Induced Glaucoma (LIG) were studied with the data of Age, Sex, literacy, Laterality and Rural/ Urban status with the duration of symptoms, Intraocular pressure and Visual Acuity. The data was analyzed by simple statistical methods. RESULTS: 50 patients, clinically diagnosed as Lens Induced Glaucoma (LIG) were studied. Age group distribution was 1(2.0%) in 40-50yrs, 13(26.0%) in >50-60yrs, 26(52.0%) in >60-70yrs and 10(20.0%) in >70 yrs. Sex distribution was 23(46.0%) of Males and 27(54.0%) of Females. Urban/ Rural status was 15(30.0%) of Urban and 35(70.0%) of Rural. Literacy status was 7(14.0%) of Literate and 43(86.0%) of Illiterate. Laterality was RE in 24(48.0%) and LE in 26(52.0%). Duration of the presenting symptoms before reporting to the Hospital was 12.0% in <48 hrs, 28(56.0%) in 48 hrs - <1 wk., 11(22.0) in 1-2 wks. and 5(10.0%) in >2wks. Intraocular pressure (IOP) in mm of Hg showed no case (0.0%) in <20, 18 (36.0%) in >20 – 40, 27(54.0%) in >40 -60 and 5(10.0%) >60 with the Mean IOP of 42.12 mm of Hg. Visual Acuity (VA) was PL +ve in 24(48.0) and HM - <3/60 in 26(52.0%) with no cases 0(0.0%) in VA of >3/60. CONCLUSIONS: Increasing age, female gender, rural, illiterate, and delayed reporting to the hospital after the presenting symptoms were the common risk factors with increased Intraocular pressure and poor visual acuity in the clinical presentation of Lens induced Glaucoma. KEYWORDS: Lens Induced Glaucoma, Senile Cortical Cataract, Intraocular pressure, Visual Acuity.

INTRODUCTION: There are 20 million blind people in India and 80.0% of this blindness is due to preventable causes.¹ Cataract in India is the most important cause of preventable blindness accounting to 63.7%.¹ With a cataract backlog of around 12 million and increasing at an estimated rate of 3.8 million annually,¹ The Lens induced secondary glaucoma, is not uncommon in India. In India, it is estimated that there are 11.2 million persons aged 40yrs and older with Glaucoma in which the secondary glaucoma could affect 2.28 million.²
Clinically, several types of glaucoma which may occur in association with the formation of cataract are an important cause of secondary glaucoma. In India, Lens induced glaucoma is common, as the incidence of cataract cases far exceeds the total number of surgeries done currently.\textsuperscript{3} Delayed treatment of senile cortical cataract leads to lens-induced glaucoma which compromises the function of the optic nerve due to rise of intraocular pressure. In India, financial, cultural and psychosocial barriers in accessing excellent surgical services still exist. There is an increasing backlog of cataract due to the population explosion with increased life expectancy in terms of utilization of the available cataract surgical services by the rural community being sub-optimal. So, lens induced glaucoma is a common cause of ocular morbidity.

METHODS: This was a hospital based prospective study in the department of Glaucoma, Sarojini Devi Eye Hospital and Regional Institute of Ophthalmology, Osmania Medical College (Govt.) Hyderabad over a period from March 2012 to August 2014. The study group included 50 Patients clinically diagnosed as Lens Induced Glaucoma. The study was approved by the institute ethical committee. The informed consent was taken from all the patients of the study group.

METHODOLOGY: Inclusion Criteria: The study group included the patients reported with pain, redness, and watering of acute onset in addition to gradual progressive loss of vision in the affected eye as their presenting complaints and were diagnosed as LIG based on the clinical findings and raised intraocular pressure.

Exclusion Criteria: Cases with a primary open or narrow angle glaucoma, secondary glaucoma due to anterior and posterior segment pathologies associated with Senile Cortical cataract, congenital cataract, secondary cataract, traumatic cataract and complicated cataract were excluded.

A detailed complete clinical history related to the illness was taken with duration of the symptoms of decrease in vision, Pain, redness and watering. The patient reported typically has a red painful eye, but careful questioning usually revealed a long history of decreasing visual acuity. Epidemiological data of Age, Sex, literacy, Laterality and Rural/Urban status was taken. Complete clinical examination of both eyes was done which included slit lamp biomicroscopy, Snellen’s Visual acuity, intraocular pressure (IOP) measurement by Goldman’s applanation tonometer, Gonioscopy, B scan and Indirect Ophthalmoscopy to know the status of the Lens, depth of the anterior chamber, angle of the anterior chamber and to exclude the posterior segment pathology. The data was analyzed by simple statistical methods.

RESULTS: The study group was 50 patients clinically diagnosed as Lens Induced Glaucoma. The most common symptoms of ocular pain, defective vision, redness and watering of the eyes and clinical signs of Circumciliary congestion, corneal edema and senile cortical intumescent cataractous lens associated with raised intraocular pressure (IOP) of >21 mm were present. The visual acuity was markedly reduced due to cataract and corneal edema secondary to a sudden rise of intraocular pressure.
This table of Epidemiological data of cases showed age group distribution as 1(2.0%) in 40-50 yrs, 13(26.0%) in >50-60 yrs, 26(52.0%) in >60-70 yrs and 10(20.0%) in >70 yrs, Sex distribution as 23(46.0%) of Males and 27(54.0%) of Females, Urban/ Rural status as 15(30.0%) of Urban and 35(70.0%) of Rural, Literacy status as 7(14.0%) of Literate and 43(86.0%) of Illiterate and Laterality as involvement of RE in 24(48.0%) and LE in 26(52.0%).

This table of duration of the presenting symptoms before reporting to the Hospital showed 6(12.0%) within 48 hrs, 28(56.0%) in 48 hrs - <1 week, 11(22.0) in 1-2 weeks and 5(10.0%) in >2 weeks.
Table of Intraocular pressure in mm of Hg of the cases showed no case (0.0%) in <20, 18 (36.0%) in >20 -40, 27(54.0%) in >40 -60 and 5(10.0%) >60. The Mean IOP was 42.12 mm of Hg.

| Sl. No. | IOP | No. | %  |
|--------|-----|-----|----|
| 1      | < 20| 0   | 0.0|
| 2      | >20-40| 18 | 36.0|
| 3      | >40-60| 27 | 54.0|
| 4      | >60 | 5   | 10.0|
| **Total** |    | **50** | **100.0** |

Table 3: Intraocular Pressure (IOP) in mm of Hg

Table of Visual Acuity of the cases showed PL +ve in 24(48.0) and HM - <3/60 in 26(52.0%) with no cases 0(0.0%) in VA of > 3/60.

| Sl. No. | Visual Acuity | No. | %  |
|--------|---------------|-----|----|
| 1      | PL +ve        | 24  | 48.0|
| 2      | HM - <3/60    | 26  | 52.0|
| 3      | 3/60 - <6/60  | 0   | 0.0|
| 4      | 6/60 - 6/18   | 0   | 0.0|
| 5      | <6/18 - 6/6   | 0   | 0.0|
| **Total** |            | **50** | **100.0** |

Table 4: Snellen’s Visual Acuity (VA)

**DISCUSSION:** Cataract remains the most important cause of curable blindness in India, affecting mostly the older rural population. Lens induced glaucoma develops when a long standing senile cortical cataract becomes mature or hypermature. Late and delayed reporting for treatment of cataract leads to Lens Induced Glaucoma, especially so in the rural population, though Cataract surgery is a very rewarding surgery. Though Lens Induced Glaucoma is a preventable and curable condition, it is still prevalent in India, in spite of easy availability of cataract surgical facilities under the National Programme for Control of Blindness (NPCB) with Government Organizations, NGOs and private practitioners.

Our study age distribution of 2.0% in 40 – 50 yrs, 26.0% in >50 – 60 yrs, 52.0% in >60 – 70 yrs and 20.0% in >70 yrs correlates with the study of Raghunandan Kothari et al of 6.0 % in 51-60yrs, 66.0% in 61-70 yrs, 26.0% in 71-80yrs and 2.0% in >80yrs with the age range of 56 to 81yrs with a mean of 68.84 yr, the study of Payal Gupta et al of 24.0% <60 years, 56.0% in 61-70 years and 20.0% in >70 years and the study of Mohindar Singh et al of age range of 49 to 77 years with a mean of 64.5yrs. There was more number of patients in 6th decade with 52.0% in our study which correlates with 56.0% in the study of Raghunandan Kothari et al and 56.0% in the study of Payal Gupta et al.
Our study sex distribution of 54.0% of Females and 46.0% of Males with the ratio of 1.2:1 correlates with 64.0% of Females and 36.0% of Males with the ratio of 1.8:1 in the study of Raghunandan Kothari et al, 70.0% Females and 30.0% Males with a ratio of 2.3:1 in the study of Ramakrishnan et al, 56.0% Females and 44.0% Males with the ratio of 1.3:1 in the study of Payal Gupta et al, 55.0% of Females and 45.0% of Males with the ratio of 1.3:1 in the study of A P Rijal et al and 59.0% Females and 41.0% with the ratio 1.5:1 in the study of Mohindar singh et al. So, our study correlates with the other studies that the Females were affected more than the Males because of the socio-economic and cultural constraints playing a role leading to negligence with late presentation of cataract in females. Our study showed 30.0% of Urban and 70.0% of Rural, 14.0% of Literate and 86.0% of Illiterate, involvement of RE in 48.0% and LE in 52.0%.

In our study, the duration of the presenting symptoms before reporting of the patients to our hospital was 12.0% within 48 hrs, 56.0% in 48 hrs - <1 wk., 22.0% in 1-2 wks. And 10.0% in > 2wks. This correlates with the study of Raghunadan et al of 16.0% in <48 hours, 44.0% in 3-6 days and 40.0% in > a week, the study of R. Ramakrishnan et al of 84.0% in <10 days and 16.0% in > 10 days, the study of Payal Gupta et al of 8.0% in < 1 day, 64.0% in 2 – 5 day, 20.0% in 6 – 10 days and 8.0% in > 10 days, the study of Mohindar singh et al of 16.0% in <48 hours, 58.5% in 3-5 days and 17% in > a week and the study of D Pradhan et al of 71.0% >10 days. So, there was a late and delayed reporting of the patients to the hospital after the presenting symptoms in the majority of the cases in our study and in all other studies. The reasons for delayed reporting may be 1) Acceptance of poor vision as a part of aging, fear of operation and socioeconomic problems 2) that many people especially in rural areas take local indigenous treatment for redness and pain in eyes and report to the eye hospital only when the symptoms become worse 3) that the very elderly visually handicapped persons are left to their own fate as no one takes care to bring them to the hospital.

In our study, Intraocular pressure (mm Hg) at clinical presentation showed no case (0.0%) in <20 mm Hg, 36.0% in >20 – 40 mmHg, 54.0% in >40 - 60 mm Hg and 10.0% in >60 mm Hg. Our study mean IOP of 42.12 mm of Hg correlates with the mean IOP of 44 mm Hg (range of 24 – 68 mm Hg) in the study of Raghunandan Kothari et al, mean IOP of 38.4 mm Hg in the study of R. Ramakrishnan et al, the mean of 42.5 mm Hg (range of 59.1 – 33 mm Hg) in the study of Payal Gupta et al, the IOP range of 24.0 – 59.0 mm Hg in the study of A P Rijal et al, the mean IOP of 44 mm Hg (range 24 - 68 mm Hg) in the study of Mohindar singh et al and >30 mm Hg in 79.0% in the study of D Pradhan et al. So, the Intra Ocular Pressure was raised with the mean around 40 mm Hg in the clinical presentation of majority of the cases in our study and in all the other studies.

In our study, Snellen’s Visual Acuity of the cases at clinical presentation was PL +ve in 48.0% and HM - <3/60 in 52.0% with no cases (0.0%) in VA of >3/60. Our study Visual Acuity correlates with the studies of, Raghunandan Kothari et al of PL +ve in 78.0% and PL doubtful in 6.0%, Payal Gupta et al of hand movement close to face or less and none of the patient had faulty light projection, Mohindar singh et al of PL +ve in 90.0% and PL doubtful in 5.0%. And D Pradhan et al of HM or less. So, the visual acuity in the clinical presentation of LIG was <3/60 in majority of the cases in our study and in all other studies.
CONCLUSIONS: Increasing age, female gender, rural, illiterate, and delayed reporting to the hospital after the presenting symptoms were the common risk factors with increased Intraocular pressure and poor visual acuity in the clinical presentation of Lens induced Glaucoma in spite of the easy availability of cataract surgery services. So, there is a need to educate the patient about the dangers of lens-induced glaucoma.

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