

Prevalence of Vitreo-Retinal Diseases in Patients Coming to Base Hospital for Cataract Surgery through Rural Screening Programme

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ABSTRACT

Background: To study the prevalence of vitreo-retinal diseases and associated risk factors in patients coming to base hospital for cataract surgery through rural screening programmer. **Methods:** The study was conducted on 1858 patients from June 2015 to February 2016. Demographic details, UCVA, detailed slit lamp examination, goldman applanation tonometry and dilated fundus examination were performed OCT and B scan were done in doubtful cases. After the cataract surgery, follow-up was done on post-operative day 1, day 5, and at day 30. During the follow up period, any early or late complications of the surgery and improvement in visual acuity was assessed. **Results:** The overall prevalence of various vitreoretinal diseases was 35.95%. Tesselated fundus (13.53%) was common vitreoretinal diseases followed by ARMD (8.72%), glaucomatous disc (4.28%). Increasing age > 60 years (68%), smoking (19.03%), hypertension (7.1%), diabetes (6.62%) were associated with higher prevalence of vitreoretinal diseases. **Conclusion:** The prevalence of vitreoretinal diseases was 35.95% which increased with age. Despite a high prevalence of cataract in our surroundings causing visual morbidity and being treatable cause of blindness focus should also draw to assess and diagnose vitreoretinal diseases as they are mainly non treatable more vision threatening and advance with age.

Keywords: Vitreo-Retinal, Cataract Surgery, Rural Screening.

INTRODUCTION

Cataract, is the second most important cause of blindness in the world after uncorrected refractive errors. It is estimated that cataract accounts for nearly 33% of all causes of blindness.^[1]

The number of people with age-related eye diseases is assumed to be on the rise with increasing life expectancy. Cataract is still the major cause of visual impairment and blindness globally, but other age-related eye diseases, that is, age-related macular degeneration (AMD), glaucoma, diabetic retinopathy (DR), and degenerative myopia, are becoming the most important causes in developed countries.^[2] The most recent data published by World Health Organization (WHO) showed that the total number of person with visual impairment worldwide in 2010 was estimated to be 285 million, including 39 million blind people, of whom around 80 per cent are above age of 50, with most of the causes being preventable.^[3]

Population based studies reported an overall prevalence of vitreo-retinal disorders of 8.56%, with

a range between 10.4% and 21.02% for the 40 years and over age group.^[3,4] Age related macular degeneration (AMD) is the third commonest cause of blindness globally and is the leading cause of irreversible blindness among the elderly in developed countries, contributing to 8.7% of total blindness.^[5] Likewise, diabetic retinopathy (DR) is the fifth leading cause of visual impairment and blindness globally, and is the most common cause of new cases of blindness among working aged adults in the developed world.^[4]

In the developing world, vitreo-retinal diseases are becoming an increasing problem, with expectations that more than half of the world's diabetic patients will live in Asian countries by the year 2030. In Rajasthan, no such population based study is undertaken other than this study.

MATERIALS AND METHODS

The present clinical study was conducted to find out the Prevalence of Vitreo-Retinal diseases in Cataract Patients coming to Alakh Nayan Mandir Eye Institute, Udaipur for cataract surgery through rural cataract screening programme between the time period of June 2015 to February 2016. The study was conducted on 1858 patients coming to base hospital for cataract surgery through rural cataract screening programme from June 2015 to February 2016

Inclusion Criteria-

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1. Patients coming to base hospital for cataract surgery through rural screening programme will be included in the study.
2. Patients who are ready to give consent.

However following exclusion criteria was used in the study:

1. Patients with pre-existing corneal pathologies will be excluded.
2. One eyed patients will be excluded.
3. Patients with traumatic cataract will be excluded.

Data Collection Method

Informed consent will be taken from all patients. All patients will be examined according to the standardized protocol and the data will be recorded in a proforma developed for the purpose (Study Proforma 1) at the base hospital which included uncorrected visual acuity, detailed slit-lamp examination, Goldman's applanation tonometry and a dilated fundus examination. In doubtful patients Optical Coherence Tomography and in patients with Total Cataract B-scan, USG, will be done to evaluate the fundus. Systemic workup of all patients will be done by Urine Sugar Levels and Blood Pressure. CT scan and MRI will be done if required.

Methods of measurement of outcome of interest:

The primary aim of the management of operated will be to restore vision and to evaluate the cause of decreased vision.

After the cataract surgery, follow-up will be done on post-operative day 1, day 5, and at day 30 as per Study Proforma 2. Patient's data including demographic details, initial visual acuity using Snellen's chart, intraocular pressure using Goldman's applanation tonometry, slit lamp examination findings, B-scan findings (if required), treatment / surgery, early and late complications and final outcome.

During the follow up period, any early or late complications of the surgery occurred will be noted; improvement in visual acuity is assessed.

Data analysis:

Pre or Post-operative fundus diagnosis were collected and noted from the proforma sheets along with the associated risk factors and systemic illnesses like diabetes and hypertension.

Chi-square test was applied to assess the overall percentage and to see the correlation between different retinal pathologies and their percentage of occurrence along with their correlation with different factors were noted and tabulated.

The correlations were made by the help of softwares like Excelr and SPSS (Version16) were used to analyzing the data. P-values of <0.05 were considered significant.

Detailed evaluation was done and data was collected as per the proforma.

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RESULTS

Demography

The number of patients in age group 1(≤60 years) was 596 and group 2(>60 years) was 1261. Males comprised of 52.7% and females 47.3% of the total study group. The overall prevalence of various vitreo-retinal disorders was 35.95%. Increasing age was associated with a higher prevalence of vitreo-retinal disorders as shown in [Table 1, Figure 1]. The prevalence was 32% for the age group (≤60 years) compared to 68% for the age group (>60 years).

Prevalence

[Table 2] shows the prevalence of vitreo-retinal disease groups. It shows the prevalence of retinal diseases was maximum (45.46%) followed by macular diseases (30.78%) then optic disc diseases (16.55%) and the last and least prevalent were vitreous diseases (7.26%).

Pattern of various vitreo-retinal disorders

Tessellated Fundus (13.83%) was the most common vitreo-retinal disorder most common vitreo-retinal disorder. This was followed by ARMD (8.72%) at second and Glaucomatous disc (4.28%) as third most common vitreo-retinal disorder.

Treatable and Non-Treatable disease

[Table 4] shows treatable diseases among the various vitreo-retinal diseases. Among treatable diseases, ARMD (8.72%) forms the most common vitreo-retinal disease among the study population followed by glaucoma (4.28%) and then by hypertensive retinopathy (1.48%).

[Table 5] shows non-treatable diseases among the various vitreo-retinal diseases. Among Non-treatable diseases, Tessellated fundus (13.83%) was the most prevalent vitreo-retinal disease followed by Asteroid Hyalosis (2.207%) and then by PPCRA (1.37%).

Risk factors

In our study we have taken following risk factors associated with vitreo-retinal diseases viz,

- Diabetes
- Hypertension
- Smoking
- Age
- Sex

DISCUSSION

This is the first population based study to report the prevalence of vitreo-retinal disorders in Rajasthan. Our findings are not representative of India because of the diverse ethnic races seen in the country that could play a role in the etiology of various eye diseases.

The overall prevalence of vitreo-retinal disorders in this study was 35.95%, a figure which is higher than some of the reports from around the region^{5,6}. There

lies the possibility in our study for a high prevalence of vitreo-retinal disorders, due to multiple factors.

We have included tessellated fundus in our study which was not included by other studies

Access to medical health care is not good in villages of Udaipur.

In investigating the prevalence of vitreo-retinal disorders and its association with age and gender, we found there to be a significant increase in prevalence with age ($p < 0.001$), and also significant difference with gender in our study with prevalence of vitreo-retinal diseases more in females ($p < 0.001$). A higher rate of vitreo retinal diseases among females in our study could probably be due to the fact that males had better access to health care services than females.

A tessellated fundus accounts for 13.83% of the eyes, which was the most common vitreoretinal pathology found in our study. It is a common characteristic of myopic eyes and is an important clinical marker for the development of retinochoroidal changes. However, the exact cause and significance of tessellated fundi have not been definitively determined. Tessellated fundus was not included in all the studies on vitreo-retinal diseases.

Table 1: Prevalance of vitreo retinal diseases

Vitreo-retinal diseases	Vitreo retinal diseases prevalence	Number	Percentage
Macular Diseases	ARMD Macular Scar Macular hemorrhage Macular Hole ERM CNVM CSME Macular traction band PED	411	30.78
Retinal Diseases	Tessellated fundus Posterior staphyloma BRVO NVE RD Choroideremia CRVO DR HTR RP Retinal Coloboma CRAO	606	45.46
Vitreous diseases	Asteroid Hyalosis PVD VH Subhyloid hemorrhage	97	7.26
Optic disc diseases	Optic disc coloboma Mylinated Nerve Fibre Glaucomatous optic atrophy NVD Glaucomatous disc Disc hemorrhage PPRCA	221	16.55
Total		1335	100

AMD has been the most common vitreo-retinal disease found in previous studies.^[5,6] As in

developed nations of the world, the increased prevalence of AMD in developing countries such as India is likely to be due to an ever increasing ageing population and improving health facilities.^[7] Other factors potentially related could be exposure to smoking, as well as unprotected exposure to ultraviolet radiation. This latter is a pertinent issue in India where the majority of the population work in fields without adequate protective eye wears.^[7-9] The prevalence of AMD in our study (8.7%) was more to the findings of a previous study (1.8%) conducted among those over 40 years in the Indian State of Andhra Pradesh¹⁰ and Aravind comprehensive eye study (2.5% in the over 40 years age group) and the India Eye study (3.8% in the over 50 years age group).^[6,11] The prevalence of AMD in our study was higher with increasing age, a finding consistent with the above mentioned studies. These findings emphasise that with longevity, AMD could become a significant public health problem in India.

Table 2: Treatable Diseases among the study population

Treatable Diseases	Number	Percentage
ARMD	324	8.72
Macular Haemorrhage	17	0.457
Glaucoma Disc	159	4.28
BRVO	6	0.161
NVE	1	0.026
NVD	2	0.053
RD	4	0.104
CNVM	3	0.080

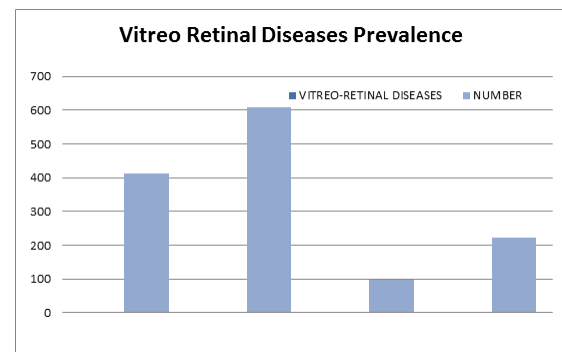


Figure 1: showing the prevalence of vitreo-retinal disease groups

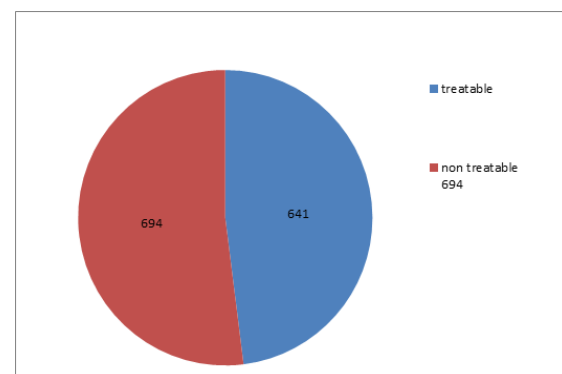


Figure 2: Treatable vs Nontreatable vitreoretinal diseases

In recent years, there have been several well conducted studies on the epidemiology of glaucoma in Asian people. These studies indicate that the prevalence of glaucoma ranges from 2.1% in Bangladesh to 5.0% in a recent Japanese population. Glaucomatous disc (4.28%) was the third most common vitreo-retinal disorder in our study. The prevalence of hypertensive retinopathy (1.48%) in a significant proportion of our population was in keeping with the findings of previous population based studies, reflecting that hypertension is a major public health concern in Rajasthan.^[13,14]

Macular hole, another sight threatening retinopathy, was found in our study population to have a prevalence of 0.32%, compared to a lower prevalence in the Aravind comprehensive eye study and a study by Sen et al. (0.16%).^[12,15] The prevalence of retinitis pigmentosa, was not different from the study conducted by Sen et al. but lower than that reported in the Aravind comprehensive eye study.^[12] The high number of retinal detachments in our population indicates the need for increased awareness, education and prompt ocular assessment because of its severe visual consequences with delayed treatment. Factors that may affect rates of retinal detachment include improper management of intraoperative complications following cataract surgery and complications related to significant ocular trauma. Similarly, rates of macular scar in our population would be a result of trauma and sequelae of intraocular inflammation.

Risk factors

We have attempted to identify possible risk factors for the presence of vitreo retinal diseases.

1. Smoking

Our finding that smoking, a modifiable exposure, was associated with the vitreo-retinal pathologies like AMD is consistent with findings from many earlier observational studies.^[16-23]

2. Hypertension

Our study also show increased prevalence of vitreoretinal diseases among hypertensive i.e. 7 out of 10 hypertensive show VR diseases. The AREDS participants with large drusen or nonvascular AMD were statistically significantly more likely to have systemic hypertension, defined as elevated blood pressure levels or current treatment with antihypertensive medications. This finding is consistent with an underlying vascular basis for AMD. As emphasized in one study¹⁶ that found an increasingly strong relationship with longer duration of hypertension, it may be important to take duration of hypertension into account when examining the relationship

3. Diabetes mellitus

Our study also showed minimal increased prevalence of vitreoretinal diseases among diabetics

as obvious as we have included diabetic retinopathy in our vitreo-retinal diseases.

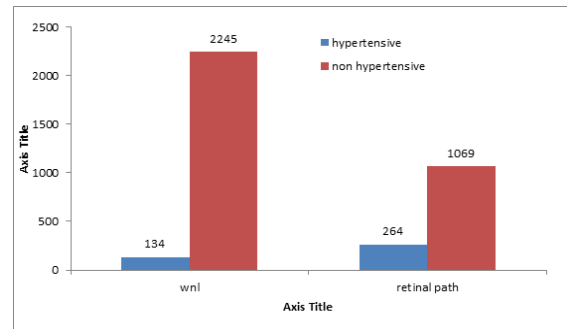


Figure 3: Prevalence of Vitreo-Retinal Diseases among Hypertensive

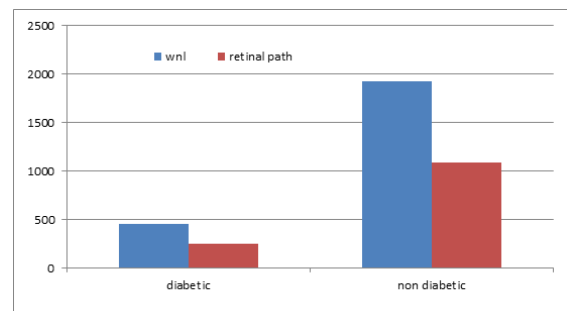


Figure 4: Prevalence OF Vitreo-Retinal Diseases among Diabetics

CONCLUSION

1. Tessellated fundus was the most common Vitreo-retinal disease among the study population.
2. Mostcommon treatable Vitreo-retinal Disease was found to be ARMD.
3. Thesecond most common Treatable Vitreo-retinal disease was glaucoma.
4. The third most common Treatable Vitreo-retinal disease was Hypertensive Retinopathy.
5. Smoking, Hypertension, and Diabetes were the modifiable risk factors were found to be associated with increased prevalence of Vitreo-retinal diseases

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