

Factors Predisposing to Rhegmatogenous Retinal Detachment in a Tertiary Care Hospital of Pakistan

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ABSTRACT

Purpose: To find out the factors predisposing to rhegmatogenous retinal detachment.

Study Design: Descriptive cross sectional study.

Place and Duration of Study: Liaquat National Hospital, Karachi, from October 2017 to April 2018.

Methods: After approval from ethical review committee 117 patients presenting with Rhegmatogenous retinal detachment (RRD) were included in the study. A detailed history was taken including previous surgery and trauma. Complete ocular examination was performed including dilated fundus examination. Data was analyzed using SPSS version 21. Mean and standard deviation were computed for quantitative variable i.e. age and frequency. Percentages were calculated for qualitative variables i.e. gender, eye involved, lattice degeneration, trauma and intraocular surgery. Stratification was done with regards to age, gender, eye involved to see the effect of these modifiers on individual factor (lattice degeneration, trauma, intraocular surgery) by using chi square test and considering p value ≤ 0.05 as significant.

Results: There were 117 patients including 91 males and 26 females. Sixty four were right eyes and fifty three were left eyes. Mean age was 37.30 ± 8.97 years. Lattice Degeneration was observed in 29.1% patents, Trauma was 37.6% and intraocular surgery was observed in 33.3% patients. There was a significant association of age with trauma ($p = 0.045$) and intraocular surgery ($p = 0.001$), which had statistically significant association with RRD.

Conclusion: Intraocular surgery, trauma were significantly associated with age and RRD. However, although lattice degeneration is an established risk factors for Rhegmatogenous retinal detachment it was not associated with increased age.

Key Words: Rhegmatogenous Retinal Detachment, Lattice Degeneration, Trauma, Intraocular Surgery.

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INTRODUCTION

In RRD longer duration of detached retina involving

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the macula and foveal center causes profound vision loss in the affected eye leading to complete blindness if not treated in time.^{1,2} According to some reports, the annual incidence of RD is between 6 to 12 per 100,000 population per year.³ RD is classified into three types on the basis of clinical appearance. Rhegmatogenous retinal detachment (RRD), Tractional retinal detachment (TRD) and Exudative/serous retinal detachment.⁴

Rhegmatogenous retinal detachment is an ophthalmic surgical emergenc,⁵ and also the most

commonly seen type.^{6,7} It is caused by liquefied vitreous which leads to traction forces producing a retinal break. Fluid gains access into the sub-retinal space and leads to RRD.⁸ It is a common sight-threatening condition.⁹ A study from Singapore reported an annual incidence of RRD as 10.5 per 100 000.¹⁰ TRD and Exudative/serous retinal detachment are less common.

Common factors contributing to development of RRD are lattice degeneration, trauma and intraocular surgery.^{11,12}

The aim of our study was to evaluate the frequency of common factors in our population as local data is scarce. It can be helpful in reducing the incidence and potential complications caused by RRD. In high risk cases, regular follow up will help in early detection to prevent delay in treatment and better surgical outcome can be achieved.

METHODS

The study was conducted in Department of Ophthalmology, Liaquat National Hospital, Karachi, from 31st October 2017 to 30th April 2018, after approval from hospital ethical review committee. Sample size was calculated by WHO software for sample size. By taking Prevalence of lattice degeneration = 18.1%, $d = 7\%$, and 95% confidence level, the calculated sample size was 117 eyes. Non-probability consecutive sampling technique was used.

Inclusion Criteria was patients presenting with RRD, diagnosed by consultant ophthalmologist, age 20 years and above and either gender. Patients with Tractional and exudative/serous detachments and RRD with vitreous hemorrhage were excluded. Verbal informed consent was obtained for all patients before data collection. All demographic information like name, age, gender were recorded. A detailed history was sought. History of cataract surgery was confirmed on examination. Slit lamp and dilated fundus examination was done pre-operatively to identify type of retinal detachment and associated factors as mentioned above. All information were collected on especially designed Performa.

Data was analyzed by using SPSS version 21. Mean and standard deviation were computed for quantitative variable i.e. age. Frequency and percentage were calculated for qualitative variables i.e. gender, eye involved, lattice degeneration, trauma,

intraocular surgery. Stratification was done with regards to age, gender, eye involved to see the effect of these modifiers on individual factors (lattice degeneration, trauma, intraocular surgery) by using chi square test and considering p value ≤ 0.05 as significant.

RESULTS

Total 117 patients of either gender with age more than 20 years were included. Out of total study subjects, 91 (77.8%) were males and 26 (22.2%) were females. There were 64 (54.7%) right and 53 (45.3%) left eyes (table-1). Mean age of the subjects was 37.30 ± 8.97 years. Age was stratified into two groups. Age was further evaluated according to stratified groups. It was observed that mean age of patients with age ≤ 35 years was 28.12 ± 4.52 years and it was 44.15 ± 3.87 years among patients with age > 35 years. The detailed descriptive statistics of age are presented in Table-1.

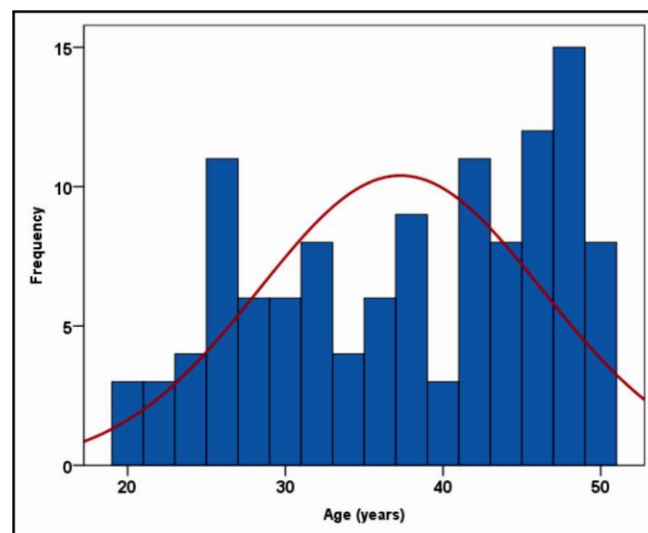


Fig. 1: Histogram Presenting Distribution of Age (n = 117).

Table 1: Descriptive statistics of patients under study.

Variable	Frequency (%)
Age (Mean \pm SD)	37.30 \pm 8.97
Age	
≤ 35 years	50 (42.7%)
> 35 years	67 (57.2%)
Gender	
Male	91 (77.8)
Female	26 (22.2)
Eye involved	
Right	64 (54.7)
Left	53 (45.3)

Lattice Degeneration		
Yes	34 (29.1)	
No	83 (70.9)	
Trauma		
Yes	44 (37.6)	
No	73 (62.4)	
Intraocular surgery		
Yes	39 (33.3)	
No	78 (66.7)	

It was observed that Lattice Degeneration was observed in 29.1%, history of trauma was present in

37.6% and history of intraocular surgery was present in 33.3%. The detailed descriptive statistics are presented in Table-2.

Stratification with respect to gender, age, and eye involved was done to observe the effect of these modifiers on individual factors using chi square test. P-value ≤ 0.05 was considered significant. The results showed that there was significant association of age with trauma ($p = 0.045$) and intraocular surgery ($p = 0.001$). The detailed results are presented in Table-2.

Table 2: Association of demographic findings with lattice degeneration, trauma and intraocular surgery.

	Lattice Degeneration		P-value	Trauma		P-value	Intraocular surgery		P-value
	Yes	No		Yes	No		Yes	No	
Age									
≤ 35 years	18 (36)	32 (64)	0.153**	24 (48)	26 (52)	0.045*	8 (16)	42 (84)	0.001*
> 35 years	16 (23.9)	51 (76.1)		20 (29.9)	47 (70)		31 (46.3)	36 (53.7)	
Gender									
Male	26 (28.6)	65 (71.4)	0.828**	35 (38.5)	56 (61.5)	0.721**	30 (33)	61 (66.7)	0.828**
Female	8 (30.8)	18 (69.2)		9 (34.6)	17 (65.4)		9 (34.6)	17 (65.4)	
Eye involved									
Right	21 (33.3)	42 (66.7)	0.226**	20 (31.7)	43 (68.3)	0.226**	22 (34.9)	41 (65.1)	0.638**
Left	12 (23.1)	40 (76.9)		24 (46.2)	28 (53.8)		16 (30.8)	36 (69.2)	

Chi-square test is applied.

*Significant at p-value < 0.05

**Insignificant at p-value > 0.05

DISCUSSION

Our study findings showed more male patients than females with mean age 37.30 ± 8.97 years with range of 20 to 50 years. There were more right eyes which had RRD. Other studies have shown that 3.1% cases RRD had history of trauma. In Ethiopia, cases of RRD had history of trauma. This percentage was 30% in South Africa and 8% in Kenya.⁴ Risk of RRD with cataract surgery was 19% from Minnesota studies, 30.8% in Swedish and 10% in Chinese reports. This association is also reported in UK and South American studies.¹⁰ A higher proportion of lattice degeneration was found in Japanese studies (60 – 65%).¹⁰

Laser photocoagulation and Cryotherapy are effective in preventing RRD if holes are detected earlier. Due to the patient's unawareness and on-going pre/intra/sub-retinal fibrosis there is development of proliferative vitreoretinopathy (PVR), making the surgical correction a difficult procedure and worsening the visual outcomes.

Our study showed that majority of the detachments were found around 50 years of age. It was also seen as males were more commonly affected with

RRD than females. The reason could be outdoor activities make the males more prone to trauma.

In third world countries there seemed to be a trend towards delayed presentation of retinal detachments to retina specialists.¹² Lack of education and limited clinical resources are the likely contributory factors. Average presentation time in these patients was 97.24 ± 16.95 days. This much time considerably compromises visual and anatomical surgical success rates.¹³ The major risk factors associated with increased incidence of RRD were intraocular surgery,¹⁴ trauma and peripheral lattice degeneration in decreasing order of frequency.¹⁵

In another study, among 107 operated eyes, there were 44.8% myopic eyes and lattice degeneration was present in 39.5% of the myopic eyes. However, we did not study this factor in our study. A UK based study reported an overall, mean prevalence of lattice degeneration to be $45.7 \pm 20.3\%$ and of myopia to be $47.28 \pm 12.59\%$.¹⁰ In a study majority of the myopic detachments (45 of 48) were present in phakic eyes depicting their early age wise occurrence before patients usually undergo senile cataract surgery.¹¹

Burton reported that patients between 40 and 60 years of age with premature posterior vitreous separation and tractional tears are found among those with lattice degeneration and low to moderate degrees of myopia leads to detachments.¹⁶ Similar presentation of 37% of total RRD in phakic and aphakic eyes in a total of 114 eyes has been reported in India by Rajendran.¹⁷

Studies from Pakistan reported 95% macula-off detachments in a series of 45 cases¹⁸ and 80% in another series of 175 cases of RRD.¹⁹ Inferior as compared to superior half and temporal as compared to nasal half were observed to be more frequently affected.¹¹

Sometimes no break is identified in RRD. Factors contributing to inability to find out primary breaks in aphakic/pseudophakic eyes include small size of break, peripherally located breaks, poor visualization on indirect ophthalmoscopy due to distortions by intraocular lens and obscuration by peripheral capsular opacification.²⁰ In 38.3% eyes only one break could be identified and in 29.9% eyes two or more breaks were present. Majority of the primary breaks were horse-shoe tears.²¹

The main limitation of our study was the small sample size. It was a single-center experience and descriptive cross sectional study design. Only few factors were studied. Further studies addressing other factors need to be done from other centers.

CONCLUSION

Trauma with 37.6% was the commonest factor followed by intraocular surgery with 33.3% and lattice degeneration with 29.1%. Age was found as a significant factor for trauma and intraocular surgery.

Ethical Approval

The study was approved by the Institutional review board/ Ethical review board. (0350-2017-LNH-ERC).

Conflict of Interest

Authors declared no conflict of interest.

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Authors' Designation and Contribution

Sahira Wasim; Resident: *Concepts, Design, Literature search, Data acquisition, Manuscript preparation, Manuscript editing, Manuscript review.*

Imran Ghayoor; Professor: *Concepts, Design, Manuscript preparation, Manuscript editing, Manuscript review.*

Munira Shakir; Associate Professor: *Manuscript preparation, Manuscript editing, Manuscript review.*

Ronak Afza; Resident: *Literature search, Data acquisition, Data analysis, Statistical analysis.*

Waqas Ali; Resident: *Literature search, Data analysis, Statistical analysis, Manuscript review.*

