FREQUENCY OF DIFFERENT GRADES OF PROLIFERATIVE VITREO-RETINOPATHY IN PATIENTS ADMITTED FOR RHEGMATOGENOUS RETINAL DETACHMENT

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ABSTRACT

Objective: To determine the frequency of different grades of proliferative vitreo-retinopathy (PVR) in patients admitted for rhegmatogenous retinal detachment repair.

Methodology: Study was conducted at Department of Ophthalmology, Lady Reading Hospital, Peshawar. Study design was descriptive and study was carried out in six months from June 1st 2014 to December 1st 2014. All the patients with rhegmatogenous retinal detachment (RRD) fulfilling the inclusion and exclusion criteria were enrolled. Patients having rhegmatogenous retinal detachment were collected and detailed history and complete ocular examination including visual acuity, pupillary examination, slit lamp examination and fundus examination were performed. Diagnostic criteria used was based upon the presence of rhegmatogenous retinal detachment and PVR was diagnosed on slit lamp biomicroscopy and indirect ophthalmoscopy. PVR was further categorized into different grades (A,B and C).

Results: Study was conducted on 177 patients. Mean age was 47 years with standard deviation±1.28. Eight percent patients had proliferative vitreo-retinopathy in which 7% patient had Grade A PVR, 57% patients had Grade B PVR and 36% patients had Grade C PVR.

Conclusion: Small number of patients were found to have PVR. Majority were having age more than 40 years with slight male predominance. Grade B PVR was the commonest identified in our study.

Key Words: Proliferative vitreo-retinopathy, Rhegmatogenous retinal detachment, Retinal detachment

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INTRODUCTION

Rhegmatogenous retinal detachment is one of the leading causes of blindness all over the world. RRD is strongly associated with certain vitreo-retinal degenerations, increasing age and myopia. The number of pseudophakic RRD appeared to be increased in the last decade due to new trends in cataract surgery techniques[1].

Primary RRD is found to have an incidence of 12.05 per 100,000 yearly. Incidence of RRD is more in male gender and right eyes. increasing age is also an important risk factor[2]. A major risk factor for PVR is RRD, as evident by aqueous flare, is the breakdown of the blood-ocular barrier[3].

One of the most common complication vitreo-retinal surgeons come across after retinal detachment surgery and other vitreo-retinal procedures is PVR, which is basically a maladapted repair process of the retinal wound; which results in the formation of epiretinal membranes due to immune and retinal cells proliferation and the cause of tractional retinal detachment in such cases.

Whenever there is PVR preferable treatment option is surgery. Although PVR stage B or C1 / C2 can well be managed with scleral buckling however the stage C3 onwards when present require vitrectomy[4]. Certain humoral and cellular factors are involved in the evolution of PVR. Proliferative vitreo-retinopathy remains a therapeutic challenge for the ophthalmologist[5] and unfortunately, so far there is no satisfactory anti-proliferative treatment available for PVR.

If PVR is present in patients with rhegmatogenous retinal detachment, it indicates a poor prognostic factor in terms of visual improvement as well as anatomical success[6].

PVR is an important disease because the prognosis directly related to stage of PVR and hence the visual outcome. With this in mind we carried out this study in our Department of Ophthalmology to find out frequency of PVR in patients admitted for rhegmatogenous retinal detachment to make some recommendations for their timely management and better outcome.

METHODOLOGY

Study was conducted at Department of Ophthalmology, Lady Reading Hospital, Peshawar. The patients presented to Out Patient Department Lady Reading Hospital Peshawar, who meets the inclusion and exclusion criteria were admitted. All patients diagnosed of having RRD according to diagnostic criteria, aging 10 years and above, both genders were included in the study to determine the frequency of different grades of proliferative vitreo-retinopathy. While cases with Opaque media making visibility of retina clinically difficult, traumatic retinal detachment, and patients with past retinal detachment surgery were not included in the study.

Written informed consent was obtained from all patients. Data of every patient was collected on a proforma having a detailed record of the disease including name, age, gender and address. Patients with RRD were collected, after complete history and ocular examination including visual acuity, slit lamp examination, pupil examination, intraocular pressure and fundus examination with both direct and indirect ophthalmoscopy. Consecutive cases that satisfies the inclusion and exclusion criteria were included. Diagnostic criteria was based upon the presence of rhegmatogenous retinal detachment and PVR was diagnosed on slit lamp bio-microscopy and indirect ophthalmoscopy.

SPSS version 10.0 was used for all analyses. For categorical variables like gender, and grades of PVR, frequencies and percentages were calculated. For numeric variables like age mean±standard deviation was calculated. Results were presented in the form of tables. To see the effect modification different grades of PVR were stratified among age and gender.

Rhegmatogenous retinal detachment was defined as separation of the retina from the retinal pigment epithelium due to break in neurosensory retina diagnosed on indirect ophthalmoscpic examination.

Proliferative vitreo-retinopathy (PVR) was defined as formation of a membrane on the vitreous face and surface of the retina due to abnormal proliferation of cells which causes puckering and retraction of the retina. We diagnose PVR with slit lamp examination and examination with indirect ophthalmoscope.

Grade A (minimal) PVR was seen on slit lamp as diffuse vitreous haze and tobacco dust.

Grade B (moderate) PVR was characterized by wrinkling of inner retinal surface, of the tortuosity of retinal blood vessels, decreased mobility of vitreous gel, retinal stiffness, and rolled edges of retinal breaks detected on slit lamp and indirect ophthalmoscopy.

Grade C (marked) PVR was said to be present when full-thickness folds of rigid retina with heavy vitreous condensation and strands are detected on slit lamp and indirect ophthalmoscopy. Grade C is further classified into grade Ca and grade Cp on the basis of anterior to the equator or posterior to the equator respectively and by the number of clock hours involved (1 to 12).

RESULTS

A total of 177 patients were observed. Age distribution among the patients was analyzed and is shown in Table 1. Mean age was 47±1.28 years.

Gender distribution was analyzed as 120(68%) patients were males and 57(32%) patients were females.

Frequency of proliferative vitreo-retinopathy among 177 patients was analyzed as 14(8%) patients had proliferative vitreo-retinopathy while 163(92%) patients didn't had proliferative vitreo-retinopathy.

Grades of proliferative vitreo-retinopathy among 14 patients were analyzed as 1(7%) patient had Grade A proliferative vitreo-retinopathy, 8(57%) patients had Grade B proliferative vitreo-retinopathy and 5(36%) patients had Grade C proliferative vitreo-retinopathy.

Stratification of grades of proliferative vitreo-retinopathy with age and gender distribution is given in Table 2 and 3 respectively.

DISCUSSION

A lot of current research is going on to improve the outcome of retinal reattachment surgery[7,8]. Proliferative vitreo-retinopathy (PVR) when present is a sign of bad prognosis and poor surgical outcome. The exact pathogenesis of PVR is yet not clear. Schepens et al, Schwartz et al and Weller et al in their research have compared the pathogenesis of PVR to normal tissue repair process but at an abnormal site[9-11]. Retinal pigment epithelium cells are always present in pre-retinal membranes of RRD and hence thought to be essential in the formation of PVR as shown by Kampik et al in their study[12]. That's why PVR occur with greater frequency in RRD with multiple tears, with giant retinal tears RRD of long duration. Metaplastic changes in the RPE cells results in the formation of fibroblast-like cells or macrophages or RPE cells. Migrating RPE cells and pigment clumps results in the formation of tobacco dust. Retinal glial cells which are derived from Muller cells or astrocytes form more rigid membranes than RPE cells in PVR membranes as shown by Kirchhof et al and Clarkson et al in their stud-

Table 1: Age distribution (n=177)

Age	Frequency	Percentage
21-30 years	9	5%
31-40 years	39	22%
41-50 years	71	40%
51-60 years	58	33%
Total	177	100%

Table 2: Stratification of grades of PVR with age (n=14)

Grades of PVR	21-30 years	31-40 years	41-50 years	51-60 years	Total
A	-	-	1	-	1
B	-	2	3	3	8
C	-	1	3	1	5
Total	-	3	7	4	14

Chi square test was applied for P value which was 0.003

Table 3: Stratification of grades of PVR with gender (n=14)

Grades of PVR	Male	Female	Total
A	1	-	1
B	5	3	8
C	3	2	5
Total	9	5	14

ies[13,14].

In our study, patients from almost all age groups were included (Mean = 47 years) but those with age around 60 years were predominant (Mode = 60 years), which may indicate that RRD is mainly a disease of old age. Male patients were predominant (68%), but as it is a hospital-based study with no defined drainage territory, nothing significant can be concluded from this result. Our study has shown that the incidence of proliferative vitreo-retinopathy was 8% in which 7% patient had Grade A proliferative vitreo-retinopathy, 57% patients had Grade B proliferative vitreo-retinopathy and 36% patients had Grade C proliferative vitreo-retinopathy. Some other international studies also showed similar results[15-19].

Some studies e.g. Hooymans et al & Nagasaki et all have shown aphakia & pseudophakia as risk factors of high grade PVR[20,21].

Dispersion of RPE cells in the vitreous due to breakdown of blood retinal barrier play main role in the pathogenesis of PVR. Cardillo et al shown in their study that peripheral retinal degenerations and closed-globe injury were not major risks for PVR Grade C and above[22,23]. The reason might be that these patients present very early because they are much concerned regarding their vision.

To prevent postoperative PVR & ultimate surgical failure we recommend that RRD with high risk features demands special attention for proper and timely management. This is the reason that primary vitrectomy even in cases with Grade B PVR, in some cases may be justified.

It is of utmost importance that for better prediction of the results of surgical techniques and better planning, vitreo-retinal surgeons identify such risk factors and their prognostic values. It will also help the surgeons to decrease patient's stress of surgery.

CONCLUSION

Small number of patients were found to have PVR. Majority were having age more than 40 years with slight male predominance. Grade B PVR was the commonest identified in our study.

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CONTRIBUTORS

JH conceived the idea, planned the study, and drafted the manuscript. MR and AT helped acquisition of data and did statistical analysis. All authors contributed significantly to the submitted manuscript.