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Original Research Article

A Hospital Based Etiologic Assessment of Vitreous Hemorrhage in Cases Reported to the Outpatient Department of the Hospital

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Abstract

Aim: The aim of the present study was to determine the etiology of vitreous hemorrhage in cases reported to our tertiary care hospital.

Methods: A cross-sectional study was conducted among the patients presenting with ocular complaints presenting to Department of Ophthalmology, Anugrah Narayan Magadh Medical College and Hospital, Gaya,Bihar, India for one year. Institutional Ethical approval was obtained for the study. Hundred patients were included in the study. Written consent was taken from all the patients in the study. A thorough history was taken before a methodical eye examination was performed. The relative afferent pupillary defect, best corrected visual acuity, neovascularization of the iris, and neovascularization of the angle were recorded.

Results: One hundred patients were enrolled in the study. Out of which, 70 were males and 30 females. The mean age group of overall patients presented with vitreous hemorrhage was 48.90years± SD 18.40 years (range 2-84 years). Unilateral presentation is more than bilateral (98% vs 2%). Most common presenting complaint of VH in our study was sudden loss of vision in 48% cases, slowly progressive loss of vision in 30% and floaters in 22% cases. Most of the patients (52%) presented with VA <1/60- PL (perception of light). 10% presented with good vision 6/6-6/18. Only 1 patient (1%) presented with no perception of light (NPL). The most common systemic illness associated was found to be hypertension (40%), diabetes (22%) and hyperlipidemia (2%). 33% patients had no systemic disease. The most common etiology of VH was proliferative diabetic retinopathy in 25% of cases followed by retinal vasculitis in 20%. The third most common etiology was closed globe injuries in 12% of cases.

Conclusion: It can be concluded that the common reason for an unexpected, painless loss of vision is a vitreous hemorrhage. Bilateral involvement is less typical than unilateral involvement. In younger age groups, retinal vasculitis (Eales' disease) and ocular trauma are the most frequent causes of vitreous hemorrhage, whereas, in older populations, proliferative diabetic retinopathy, retinal vein blockage, posterior vitreous detachment, and retinal tear are the most frequent causes.

Keywords: Vitreous Hemorrhage (VH), Etiology, Proliferative diabetic retinopathy, Retinal vasculitis.

Introduction

Vitreous hemorrhage is defined as the presence of extravasated blood within the space outlined by the internal limiting membrane of the retina posteriorly and laterally, the non-pigmented epithelium of the ciliary body antero laterally, and the lens zonules and the posterior lens capsule anteriorly. [1,2] Vitreous hemorrhage is one of the most common diseases presenting to emergency with sudden loss of vision. The incidence of spontaneous vitreous hemorrhage worldwide is found to be 7 cases per 1, 00,000 population. [3]

Vitreous hemorrhage leads to a sudden appearance of floaters, visual haze, smoke signals, perception of red or more commonly, black shadows and cobwebs. In more dense vitreous hemorrhage there is a sudden loss of vision. [4] The causes of spontaneous vitreous hemorrhage can be better understood by four main patho-physiological mechanisms: retinal vascular disorders that cause retinal ischemia, retinal vascular abnormality not associated with retinal ischemia, normal retinal vessel rupture and breakthrough of sub-retinal hemorrhage dissecting through the retina without an associated retinal detachment. Blunt or penetrating ocular trauma, orbital trauma and systemic trauma may cause a variety of posterior segment abnormalities including vitreous hemorrhage. The vitreous hemorrhage has been highlighted as an important ophthalmological emergency of a serious ocular dysfunction of varying etiology that often has systemic association. [5]

Vitreous haemorrhage is a common cause of sudden painless loss of vision which usually present with sudden appearance of floaters, smoke signals, perception of red or black shadows and cobwebs. If flashes of light precede these symptoms, then posterior vitreous detachment, retinal detachment or retinal break should be considered. [6] Vision loss in cases of vitreous haemorrhage depends on the density of haemorrhage and even 10 microliters of blood can reduce vision to hand movement. [7]

Vitreous hemorrhage can be managed through pan retinal photocoagulation (PRP), cryopexy, and vitrectomy depending upon the cause, clarity of media and the latest, with intravitreal anti vascular endothelial growth factor (VEGF) such as intravitreal bevacizumab. [8] The amount of vitreous hemorrhage, patient's visual and systemic status determines the mode of treatment approach. [9]

The aim of the present study was to determine the etiology of vitreous hemorrhage in cases reported to our tertiary care hospital.

Materials and Methods

A cross-sectional study was conducted among the patients presenting with ocular complaints presenting to Department of Ophthalmology, Anugrah Narayan Magadh Medical College and Hospital, Gaya,Bihar, India for one year. Institutional Ethical approval was obtained for the study. Hundred patients were included in the study. Written consent was taken from all the patients in the study. A thorough history was taken before a methodical eye examination was performed. The relative afferent pupillary defect, best corrected visual acuity, neovascularization of the iris, and neovascularization of the angle were recorded.

To rule out secondary glaucoma, intraocular pressure was measured using a Goldman's Applanation Tonometer. Both eyes underwent thorough fundus examinations. For posterior segment examination in hazy media, a USG B scan was performed to check for retinal tumors or retinal detachments. To search for leaky vessels and underlying etiology, FFA was performed in clear media. Every patient had their blood pressure recorded with a

standard mercury sphygmomanometer. The laboratory tests performed were blood sugar, including HbAIc, lipid profile, hemoglobin, bleeding time (BT), clotting time (CT), ESR, and ECG if required.

Statistical analysis: Data collection and analysis were carried out using an MS Excel spreadsheet and SPSS version 22. (Chicago, IL, USA). While qualitative factors were expressed in proportions and percentages, quantitative data were expressed using means and standard deviations. To determine the difference between the two proportions, Fisher's exact test was performed.

Results

Table 1: Demographic distribution

Demographics	**Number N(%)**
Age(yrs) <10	4 (4)
11-20	6 (6)
21-30	12 (12)
31-40	12 (12)
41-50	15 (15)
51-60	25 (25)
61-70	20 (20)
>70	6 (6)
Sex Male	70 (70)
Female	30 (30)
Laterality Unilateral	98 (98)
Bilateral	1 (2)
Affected eye Right	47 (47)
Left	49 (49)
Both	4 (4)

One hundred patients were enrolled in the study. Out of which, 70 were males and 30 females. The mean age group of overall patients presented with vitreous hemorrhage was 48.90 years± SD 18.40 years (range 2-84 years). Unilateral presentation is more than bilateral (98% vs 2%).

Table 2: Presenting symptom of vitreous haemorrhage and Presenting Visual Acuity

Presenting symptoms	**N%**
Sudden loss	48 (48)
Progressive LOV	30 (30)
Floaters	22 (22)
Presenting VA	
6/6-6/18	10 (10)
<6/18-6/60	15 (15)
<6/60-3/60	6 (6)
<3/60-1/60	15 (15)
<1/60-PL	52 (52)
NPL(No perception of light)	1(1)
Difficult to assess	1 (1)

Most common presenting complaint of VH in our study was sudden loss of vision in 48% cases, slowly progressive loss of vision in 30% and floaters in 22% cases. Most of the patients (52%) presented with VA <1/60- PL (perception of light). 10% presented with good vision 6/6-6/18. Only 1 patient (1%) presented with no perception of light (NPL).

Table 3: Systemic association of vitreous hemorrhage

Systemic diseases	No. of patients (%)
No systemic disease	33 (33)
Hypertension	40 (40)
Diabetes mellitus	22 (22)
Heart diseases	2 (2)
Hyperlipidemia	2 (2)
Bleeding disorders	1(1)

The most common systemic illness associated was found to be hypertension (40%), diabetes (22%) and hyperlipidemia (2%).33% patients had no systemic disease.

Table 4: Etiology of vitreous hemorrhage cases in the study

Diagnosis	Frequency (N)	Percentage
Proliferative diabetic retinopathy	25	25
Retinal vasculitis **(Eales' disease)**	20	20
Branch retinal vein occlusion	10	10
Closed globe injury	12	12
Rhegmatogenous retinal detachment	7	7
Age-related macular degeneration	5	5
Open globe injury	4	4
Terson' s syndrome	2	2
Central retinal vein occlusion	4	4
Posterior uveitis	1	1
Posterior vitreous detachment	2	2
Tractional retinal detachment	1	1
Retinopathy of Prematurity	1	1
Complications of laser in diabetic retinopathy	3	3
Not known	3	3
Total	100	100%

The most common etiology of VH was proliferative diabetic retinopathy in 25% of cases followed by retinal vasculitis in 20%. The third most common etiology was closed globe injuries in 12% of cases.

Discussion

A translucent, color less gel called vitreous humor makes up around 80% (4ml) of the volume of the eye. Vitreous body is surrounded by a layer of collagen called the vitreous membrane (or hyaloid membrane or vitreous cortex) separating it from the rest of the eye. It makes up four-fifths of the volume of the eyeball. The vitreous humour is fluid-like near the centre, and gel-like near the edges. A common cause of an unexpected, painless loss of vision is a vitreous hemorrhage, which typically manifests with the abrupt appearance of floaters, smoke signals, the perception of red or black shadows, and cobwebs. When these symptoms are preceded by light flashes, posterior vitreous detachment, retinal detachment, or retinal break should be taken into account.

Even 10 microliters of blood can restrict vision to hand movement in cases of vitreous hemorrhage, depending on the density of the hemorrhage. [10] Retinal vascular problems, which result in retinal ischemia and release angiogenic substances like endothelial growth factor, which encourage the creation of new blood vessels from the disc and retina, are the primary cause of vitreous hemorrhage. [11]

In our study males (70%) outnumbered females which corresponds to the study by Lean JS et al (1980) and Rishi et al (2013) (201 males out of 264 patients). [12,13] It is probably because of a greater prevalence of trauma and Eales disease among males. In our study too, greater prevalence of vitreous hemorrhage in males similar to the study by Sharma et al (2010) is due to the fact that the males are more outgoing and susceptible to trauma and accidents. [1] Most common presenting complaint of VH in our study was sudden loss of vision in 48% cases, slowly progressive loss of vision in 30% and floaters in 22% cases. Results are similar to a study done by Sharma et al (2010) [1] which showed that the sudden decreased vision (38.2%) or slowly progressive loss of vision (23.2%), floaters (22.8%) and photopsia (4%) in their patient presenting with vitreous hemorrhage.

The most common systemic illness associated was found to be hypertension (40%), diabetes (22%) and hyperlipidemia (2%).33% patients had no systemic disease. Diabetes and hypertension are most commonly associated systemic association with vitreous haemorrhage while deranged lipid profile exaggerated retinal ischaemia in diabetic retinopathy. These factors are also risk factors for retinal vein occlusion and rupture of retinal macroaneurysm. Majority of patients presented with VA between <1/60 and PL in this study. This may be because our centre being a tertiary eye center, patients referred from other local clinics usually have severe trauma and may have poor vision at presentation as well as they are referred after prolonged duration of illness.

The most common etiology of VH was proliferative diabetic retinopathy in 25% of cases followed by retinal vasculitis in 20%. The third most common etiology was closed globe injuries in 12% of cases. while in a study by Butner and McPherson et al., [14] four most common cause of spontaneous vitreous haemorrhage were diabetic retinopathy (34.1%), retinal break without retinal detachment (22.4%), rhegmatogenous retinal detachment (14.9%) and retinal vein occlusion(13%). Dana MR et al [15] in their study found proliferative diabetic retinopathy (35.2%), ocular trauma (12%), retinal vein occlusion (7.4%) and retinal tear without a detachment(7%) as most common cause of vitreous haemorrhage. Winslow RL and Taylor BC [16] found proliferative diabetic retinopathy (54%), retinal tear (12.1%), posterior vitreous detachment (12%) and vein occlusion(10.4%) as the important cause of vitreous haemorrhage. [17]

Conclusion

It can be concluded that the common reason for an unexpected, painless loss of vision is a vitreous hemorrhage. Bilateral involvement is less typical than unilateral involvement. In younger age groups, retinal vasculitis (Eales' disease) and ocular trauma are the most frequent causes of vitreous hemorrhage, whereas, in older populations, proliferative diabetic retinopathy, retinal vein blockage, posterior vitreous detachment, and retinal tear are the most frequent causes. Males are more likely to present when they are between the ages of 20-30 years on average. The two systemic diseases that were discovered to be most frequently linked to vitreous hemorrhage were determined to be diabetes and hypertension.

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