

Prospective Observational Study of Subconjunctival Hemorrhage: It's Prevalence and Associated Factors In Bundelkhand Region

Dr. Mohd. Arshad¹, Dr. Preeti Chaubey²

¹Assistant Professor, Department of Ophthalmology, MLB Medical College Jhansi, India

²Junior Resident, Department of Ophthalmology, MLB Medical College Jhansi, India

Abstract: ***Objective:** To study prevalence, associated conditions, age, gender distribution and location of subconjunctival hemorrhage (SCH) in Bundelkhand region. **Methodology:** This was prospective, observational and non-interventional study that was carried out in ophthalmology department MLB Medical College Jhansi. Total of 1000 patients who visited to OPD, emergency or referred from other departments with SCH were included study. Data was collected from patients which included, age, gender, history of trauma, medical history, and ocular history. For location of SCH conjunctiva was divided into 4 areas. **Results:** Out of 1000 patients with SCH 354 (35.4%) were women and 646 (64.6%) were men, with a mean age of 29.56 years. 697 (69.9%) patients had traumatic and 303 (30.1%) had spontaneous SCH. Of traumatic SCH group (67.15%) were men and (32.85%) were women. In patients with spontaneous SCH no apparent cause was seen in 140 (46.2%) patients, and most common associated factor was hypertension which was present in 108 (35.6%) patients. SCH was more common in the temporal areas than other areas (41.1%). **Conclusion:** The most of common cause of SCH which was seen in our study was traumatic subconjunctival hemorrhage. Traumatic SCH was seen more common in young age group while spontaneous SCH was more common in older age group. Most common associated condition in spontaneous SCH was hypertension while in majority of cases no apparent cause was seen.*

Keywords: Etiology, Subconjunctival hemorrhage Spontaneous

1. Introduction

Subconjunctival hemorrhage (SCH) is a common benign condition of the eye that has characteristic features, such as the painless acute appearance of a sharply circumscribed redness of bleeding underneath the conjunctiva in the absence of discharge, and inflammation in contiguous areas. Subconjunctival hemorrhage is a common eye disease that is caused by the rupture of a conjunctival vessel, resulting in a local extravasation of blood into the subconjunctival tissue and subconjunctival episcleral space¹. The condition usually becomes apparent in the externally exposed part of the bulbar conjunctiva, where the blood readily finds space in the loose subconjunctival tissue^{2,3}. A subconjunctival hemorrhage is usually flat with sharply defined edges. The initially red hemorrhage turns orange and yellow when blood degradation and absorption take place, with absorption usually being complete at four to seven days after the hemorrhage⁴. Due to the benign natural course of the disorder, therapy is normally not necessary; however, a subconjunctival hemorrhage frequently causes considerable alarm to the patient, therefore, most affected patients may have sought medical help^{5,6}. Causes of subconjunctival hemorrhage are numerous, with local trauma being one of the most common etiologies. Other cases result from spontaneous rupture of a conjunctival vessel and is called non-traumatic subconjunctival hemorrhage (NTSCH) or spontaneous subconjunctival hemorrhage and could be caused by various factors or without obvious causes^{7,8}. A small proportion of NTSCH are associated with systemic hemorrhagic diseases, including platelet and coagulation disorders⁶ anticoagulant or antiplatelet therapy⁹ systemic vascular disease such as arterial hypertension or diabetes mellitus⁸ or other relevant disorders. Reduction in visual

acuity is not expected. It can vary from dot-blot hemorrhages to extensive areas of bleeding that render the underlying sclera invisible^{10,11}. Histologically, SCH can be defined as hemorrhage between the conjunctiva and episclera, and the blood elements are found in the substantia propria of the conjunctiva when a subconjunctival vessel breaks^{12,13}. It is thought that this significant increase depends on the increase of prevalence of systemic hypertension after the age of 50 years; also, diabetes mellitus, hyperlipidemia, and the use of anticoagulation therapy becomes more frequent with aging. Generally, SCH is most often seen in the inferior and temporal areas of the conjunctiva, but trauma causes localized hemorrhage at the site of injury, especially in the temporal areas¹⁴. The fibrous connections under the conjunctiva, including elastic and connective tissues, become more fragile with age, and this can be the reason for easy spread of hemorrhage in older patients^{15,16}. Traumatic SCH is more likely to remain localized around the site of impact compared to diffuse SCH-associated systemic vascular disorders. The objective of the study was to determine associated conditions, gender distribution and the incidence of SCH at each conjunctival location.

2. Method

This was a prospective observational study.

Inclusion Criteria: Consecutive patients with SCH attending our outpatient clinic were enrolled between May 2016 to May 2017.

Exclusion Criteria: Patients with other common causes of red eye such as conjunctivitis; episcleritis and scleritis; keratitis and corneal ulcer; iritis; glaucoma and other

common conditions such as dry eye and blepharitis were excluded. Subconjunctival haemorrhages associated with globe rupture were also excluded.

Verbal informed consent was obtained from all study patients. Each patient's age, gender, medical history and ocular history were assessed at the initial visit. The diagnosis of SCH was based on inspection and slitlamp examination. The medical history included the presence of systemic diseases, such as diabetes, hypertension, cardiovascular abnormality or any bleeding disorder, medications (e.g., aspirin, coumadin), eye rubbing, sneezing, heavy lifting, trauma and Valsalva. Clinical examination has included complete ocular examination including inspection, slitlamp examination and funduscopy. Laboratory investigations including CBC, BT, CT, PT, blood sugar and total serum protein was done. Patients with SCH were classified in two groups; traumatic and spontaneous. Traumatic SCH was defined as SCH resulting from trauma. Spontaneous SCH was defined as any SCH not related to trauma.

Location of SCH: The anterior segment was examined with a slit lamp. Detailed drawings were used to record the results of slit lamp examination. The conjunctiva was divided into 4 equal areas as follows; superior(S), nasal(N), inferior(I), temporal(T). The location of the SCH was noted for each patient. If the SCH extended more than one area, each area was noted separately. **Statistical Analysis:** The unpaired Student's test was used to compare mean values. For comparisons between the two groups, we applied the Chi 2 test of independence test. A p value of ≤ 0.05 was considered significant.

3. Results

1000 patients with SCH were evaluated. They consisted 354 (35.4%) women and 646 (64.6%) men. Mean age was 33.25 ± 18.43 .

Table 1: Shows the characteristics of patients

Variables	Traumatic SCH	Spontaneous SCH	Total
No of cases	697	303	1000
Gender			
Male	468	178	646
Female	229	125	354
Eye involvement			
Right eye	345	160	533
Left eye	352	153	511
Location			
Nasal	203	82	285
Superior	82	51	133
Temporal	311	143	454
Inferior	163	68	231
Total	759	344	1103

Table 2: Age distribution of subconjunctival hemorrhage

Range(years)	Traumatic subconjunctival hemorrhage	Spontaneous subconjunctival hemorrhage	Total
0-10	15(2.1%)	11(3.6%)	26
11-20	86(12.3%)	15(5%)	101
21-30	178(25.5%)	22(7.3%)	200
31-40	183(26.3%)	50(16.5%)	233
>40	235(33.8%)	205(67.6%)	440
Mean Age	28.76 ± 7.45	56.23 ± 10.25	1000
Total	697	303	
p<0.05			

- Table no 2 shows that the mean age of patients in group 1 is 28.76 ± 7.45 years and the mean age of group 2 is 56 ± 10.25 years.
- p Value was < 0.05 which was statistically significant.

Table 3: Associated condition in spontaneous subconjunctival hemorrhage

Associated conditions in spontaneous subconjunctival hemorrhage	No of patient
Hypertension	108(35.6%)
Vomiting	3(1%)
Sneezing	5(1.7%)
Decreased platelet count	15(5%)
Patients taking aspirin	32(10.5%)
Not apparent	140(46.2%)
Total	303

Table 4: Frequency of areas of subconjunctival hemorrhage

	Frequency	Percent
Nasal	285	25.8
Superior	133	12.1
Temporal	454	41.1
Inferior	231	21.0
Total	1103	100

Table 5: Number of areas involved in all patients

Number of quadrants involved	Number of patients	Percent
1	589	58.9
2	203	20.3
3	105	10.5
4	103	10.3
Total	1000	100

4. Figures



Figure 1: Nasal subconjunctival hemorrhage



Figure 2: Temporal subconjunctival hemorrhage



Figure 3: Subconjunctival hemorrhage involving all quadrants

5. Conclusion

1000 patients with SCH were evaluated. They consisted 354(35.4%) women and 646 (64.6%) men. Mean age was 33.25 ± 18.43 . Table-1 shows the characteristics of patients. Of the 1000 patients with SCH, 697 (69.7%) had traumatic and 303(30.3%) had spontaneous SCH. The majority of the spontaneous SCH group was male (58.75%) and in traumatic group also (67.15%). Men were more likely to have traumatic SCH. Among the 303 patients with spontaneous SCH, hypertension was the common associated condition in 108(35.6%) patients (Table-3). Patients with traumatic SCH were younger than patients with spontaneous SCH. Associated ocular findings were; periorbital ecchymosis, periorbital edema, and laceration on upper eye lid or lower lid. The mean ages for traumatic and spontaneous SCH respectively were 28.76 ± 7.45 and 56.23 ± 10.25 . SCH was more common in temporal areas than other areas (41.1%). Table-4 shows the distribution of SCH. In 589 patients (58.9%) SCH was seen in only one area.. The right and left eye were involved equally. There were no statistically significant differences between spontaneous and traumatic SCH with respect to eye involvement ($p=1.00$) and location of SCH ($P=0.50$).

6. Discussion

In this study we observed the associated conditions, gender distribution of patients with SCH and most seen conjunctival areas of the disease. Unlike previous studies, in this study

the frequency of trauma in patients with SCH was higher up to 68%.^{5,9} In a study Mimura et al reported the ratio of the traumatic SCH as 8.7%.⁵ In another study Kaimbo et al found this ratio as 51.7%. We thought that high frequency of traumatic SCH is due to low socio economical level of the population. Also the region is an agricultural area. Work injuries are used to be seen in many clinics of the hospital. Spontaneous SCH was most frequently associated with hypertension. This finding was consistent with previous studies. Other associated conditions were rare and included vomiting and sneezing.. Also SCH was found more frequently in males in traumatic cases and in spontaneous cases. The higher risk in male is probably related to working in heavy work and having more aggressive nature. SCH was more often found in temporal areas. In the traumatic patients with SCH it is an expected finding. There may be two reasons. One of them is protective effect of the nose for the nasal area. The other is large temporal bulbar conjunctiva. SCH is reported to be related to some other etiologies as; febrile systemic infections dengue, malaria, carotid cavernous fistula and delivery.

References

- [1] Fukuyama J, Hayasaka S, Yamada K, Setogawa T. Causes of subconjunctival hemorrhage. *Ophthalmologica*. 1990;200:63-67.
- [2] Pitts JF, Jardine AG, Murray SB, Barker NH. Spontaneous subconjunctival haemorrhage– a sign of Hypertension? *Br J Ophthalmol*. 1992;76(5):297-299.
- [3] Wilson RJ. Subconjunctival hemorrhage: overview and management. *J Am Optom Assoc*. 1986;57(3):376-380.
- [4] Mimura T, Yamagami S, Funatsu H, Usui T, Ono K, Araie M, et al. Management of subconjunctival haematoma by tissue plasminogen activator. *Clin Experiment Ophthalmol*. 2005;33:541-542.
- [5] Mimura T, Usui T, Yamagami S, Funatsu H, Noma H, Honda N, et al. Recent causes of subconjunctival hemorrhage. *Ophthalmologica*. 2010;224:133.
- [6] Superstein R, Gomolin JE, Hammouda W, Rosenberg A, Overbury O, Arsenault C. Prevalence of ocular hemorrhage in patients receiving warfarin therapy. *Can J Ophthalmol*. 2000;35:385–389.
- [7] Bodack MI. A warfarin-induced subconjunctival hemorrhage. *Optometry*. 2007;78(3):113–118.
- [8] Groomer AE, Terry JE, Westblom TU. Subconjunctival and external hemorrhage secondary to oral anticoagulation. *J Am Optom Assoc*. 1990;61(10):770-775.
- [9] Kaimbo Wa Kaimbo D. Epidemiology of traumatic and spontaneous subconjunctival haemorrhages in Congo. *Bull. Soc. Belge Ophthalmology*. 2009;311:31-36.
- [10] Lynn WA, Lightman S. The eye in systemic infection. *Lancet*. 2004;364:1439-1450.
- [11] Kaimbo WA Kaimbo D, Spileers W, Missotten L. Ocular emergencies in Kinshasa (Democratic Republic of Congo). *Bull Soc belge Ophthalmol*. 2002;284:49-53.
- [12] Lee HM, Naor J, De Angelis D, Rootman DS. Primary localised conjunctival amyloidosis presenting with recurrence of subconjunctival hemorrhage. *Am J Ophthalmol*. 2000;129(2):245-247.
- [13] Najjar DM, Youssef OH, Flanagan JC. Palpebral subconjunctival haemorrhages in herpes Zoster

- ophthalmicus. Ophthal Plast Reconstr Surg. 2008;24(2):162-164.
- [14] Kaimbo WA, Kaimbo D, Missotten L. Severe subconjunctival haemorrhage associated with malaria. Bull Soc Belge Ophthalmol. 1999;271:51-53.
- [15] Pong JC, Lam DK, Lai JS. Spontaneous subconjunctival hemorrhage secondary to carotid-cavernous fistula. Clin Experiment Ophthalmol. 2008;36(1):90-96.
- [16] Jain IS, Singh YP, Grupta SL, Gupta A. Ocular hazards during birth. J Pediatr Ophthalmol Strabismus. 1980;17(1):14-16.
- [17] Castro XSH, Quintero OH, Ferrer LG, Gorte PR. Factores de riesgo en las afecciones oftalmologicas neonatales. Rev Cubana Med Gen Integr. 2001;17:356-359. (French) Nedime Sahinoglu-Keskek et al.