EPIDEMIOLOGY OF TRAUMATIC AND SPONTANEOUS SUBCONJUNCTIVAL HAEMORRHAGES IN CONGO

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ABSTRACT

Purpose: To determine frequency and associated conditions of subconjunctival haemorrhage

Methods: A descriptive and cross-sectional study of all consecutive patients with traumatic and spontaneous subconjunctival haemorrhage (SCH) examined between 1999 and 2004 in a general practice of ophthalmology.

Results: There were 58 (0.8%) patients with SCH (61 eyes) among 6843 consulting patients. They consisted of 34 (58.6%) women and 24 (41.4%) men, with a mean age (SD) of 30.7 years (16). Among the 58 patients with SCH, 30 (51.7%) had traumatic SCH and 28 (48.3%) had spontaneous SCH. In both populations of patients, females outnumbered males. The mean age was 35.5 and 26.4 years for patients with spontaneous and traumatic SCH, respectively (*P= 0.04*). Patients with spontaneous SCH presented earlier (⩽ 3 days, *P= 0,006*) and complained of a red eye at a greater extent than patients with traumatic SCH (*P=0.02)*. There were no statistically significant differences between the patients with spontaneous and traumatic SCH with respect to gender (*P = 0.75*), eye involvement (*P=0.69*), location of SCH (*P = 0.23*) and occupation of patients (*P = 0.50*). The condition was unilateral in 90% of eyes. Location of SCH was most found to be temporal (36.1%) or nasal (26.2%). In spontaneous SCH, no apparent associated condition was found in 64.3%. Hypertension (14.3%) was the most frequent associated condition. Other associated conditions were rare and included vomiting, sneezing, malaria, hypoglycaemia, sickle cell disease and delivery. In traumatic SCH, 67% injuries occurred at home.

Conclusion: SCHs were seen in 0.8% of patients and occurred more frequently in women than in men in this study.

KEY WORDS

Subconjunctival haemorrhage. Trauma. Spontaneous. Associated condition.

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Submitted : 17-10-08
Accepted: 23-03-09

INTRODUCTION

A ruptured vessel with blood accumulation in the subconjunctival space describes a subconjunctival haemorrhage (SCH). SCH is a common, usually benign disorder that is easily detectable. It can be caused by systemic diseases, local affections or trauma [1-7]. The objective of the study was to determine frequency and associated conditions of SCH.

METHODS

Patient Population

This study was a descriptive and cross-sectional study of consecutive patients with SCH examined between 1999 and 2004 at a general practice of ophthalmology. The study was approved by the University of Kinshasa's Institution Review Board and followed the tenets of the Declaration of Helsinki. Verbal informed consent was obtained from all study patients. All patients with newly diagnosed SCH who presented for evaluation during this study period were considered. We included patients with traumatic and spontaneous SCH. Were excluded other common causes of a red eye such as conjunctivitis (acute: allergic, bacterial, viral and chlamydial; chronic); episcleritis and scleritis; keratitis and corneal ulcer; iritis and intraocular inflammations (endophthalmitis), glaucoma (acute and chronic); and other common conditions such as dry eye and blepharitis. Subconjunctival haemorrhages associated with rupture of the globe were also excluded from the study. Patients with SCH were classified in two groups: patients with traumatic SCH and those with spontaneous SCH. Traumatic SCH was defined as SCH related to or resulting from trauma. Spontaneous SCH was defined as any SCH not related to trauma that happened without apparent external cause.

Evaluation Procedures

The diagnosis of SCH was based on inspection and slit lamp examination. For all patients, medical, clinical examination and ancillary studies were performed. The medical history included the presence of systemic diseases, such as hypertension, diabetes, cardiovascular abnormality, collagen vascular disease, jaundice, or any bleeding disorder; medications (e.g., aspirin, coumadin), eye rubbing, cough. We searched for the occurrence of trauma, heavy lifting or Valsava before the complaints. Clinical examination had included complete ocular examination including inspection, slit lamp examination, funduscopy, and physical examination by a physician who checked for systemic disease (by inquiring about medical history, performing physical examination, recording temperature, measuring blood pressure, taking pulse rate, respiratory rate and detecting eventual cardioarrythmia). Detailed drawings were used to record the results of slit lamp examination and external photographs were taken.
Ancillary studies included complete blood count with platelets, bleeding time, prothrombin time, and haemoglobin electrophoresis if recurrent SCH. A chest, orbit radiograph or a CT scan of the orbits and brain were performed whenever needed.

Statistical Analysis

Chi2 value or Fisher exact test, as appropriate, were calculated to test for significance of a relation between dichotomous variables. Student's *t* test was used to compare between means or ordered variables. Characteristics of patients with spontaneous SCH were compared with those of patients with traumatic SCH. A p value of $\leqslant 0.05$ was considered significant.

RESULTS

There were 58 patients with SCH (61 eyes) out of 6843 patients that were evaluated, giving a frequency of 0.8% (0.4% for traumatic SCH and 0.4% for spontaneous SCH). They consisted in 34 (58.6%) women and 24 (41.4%) men (sex ratio of 1.2:1). Age range was 0.05-63 years, with a mean age (±SD) of 30.7 years (±16). The characteristics of patients are summarized in Table 1.
Among the 58 patients with SCH, 28 (48.3%) had spontaneous SCH and 30 (51.7%) had traumatic SCH. Fifty-four (93.1%) of these SCH were as a first episode and four (6.9%) were considered as being a recurrence. In both populations of patients, females outnumbered males. Seventeen (60.7%) spontaneous SCH patients

Table 1: *Characteristics of patients with SCH*

Variables	Spontaneous SCH	Traumatic SCH	Total	P-value*
Number of cases	28	30	58	
Frequency	0.4 (28 out of 6843)	0.4 (30 out of 6843)	0.8 (58 out of 6843)	
Age group (years)				*P = 0.29*
0-10	2	5	7	
11-20	4	8	12	
21-30	6	4	10	
31-40	5	8	13	
41-50	6	3	11	
>50	5	2	7	
Total	28	30	58	
Age				*P = 0.04*
Mean	35.3	26.4	30.7	
SD	17.0	15.8	16.0	
Median	37	28		
Range	0.005-63	2-56	0.005-63	
Gender				*P = 0.75*
Female	17	17	34	
Male	11	13	24	
Occupation:				*P* = 0.50
Pupils and students	6	11	17 (29.31%)	
Housewife	8	7	15 (25.86%)	
Managerial/Professional	7	8	15 (25.86%)	
Other	7	4	11 (18.96%)	
Apparition				*P = 0.11*
First episode	25	30	54 (93%)	
Recurrence	3	0	4 (7%)	
Eye involvement				*P = 0.61*
Bilateral	2	4	6	
Right eye	14	12	26	
Left eye	13	16	29	
Time to presentation (days)				*P = 0.006*
1-2	17	8	25	
3 or more	11	22	32	
				P = 0.03
Mean	2.9	5.2		
SD	2.8	4.5		
Median	2	4		
Localisation of SCH				*P = 0.23*
Temporal	12	7	19 (31.15)	
Nasal	7	8	15 (24.59)	
Entire conjunctiva	3	9	12 (19.67)	
Temporal + Nasal	1	2	3 (4.92)	
Temporal + Inferior	0	4	4 (6.56)	
Nasal + Inferior	3	1	4 (6.56)	
Superior	2	1	3 (4.92)	
Inferior	1	0	1 (1.63)	
Total	29	32	61 (100)	
Symptoms in patients with SCH				*P = 0.02*
Red eye	26	19	45	
Decreased visual acuity	0	7	7	
Swelling	1	3	4	
Itching	1	1	2	
Total	28	30	58	

* P-value for the difference between spontaneous and traumatic SCH.

and 17 (56.7%) traumatic SCH patients were females.

Patients with spontaneous SCH were older than patients with traumatic SCH (*P = 0.04*). The mean age for patients with spontaneous SCH was 35.3 years, whereas those of the patients with traumatic SCH was 26.4 years (Table 1). Patients with spontaneous SCH presented earlier (3 days vs. 5 days, *P = 0,006*) and complained of red eye at a significant greater extent than patients with traumatic SCH. (*P = 0.02)* (Table 1).

There were no statistically significant differences between the two populations (spontaneous and traumatic SCH) with respect to gender (*P = 0.75*), eye involvement (*P = 0.69*), location of SCH (*P = 0.23*) and occupation of patients (*P = 0.50*)(Table 1). For all patients, presenting signs included red eye (76%), decreased visual acuity (12%), eyelid swelling (6%) and itching (6%). The right side was involved in 18 (29%) eyes, and the left eye side was involved in 37 (61%) eyes; both sides in 6 (10%) eyes of 3 patients. Location of SCH was most frequently found to be temporal (lateral) in 22 (36%) eyes, or nasal (medial) in 16 (26%) eyes (Table 1). Resolution of the haemorrhage ranged from 5 to 24 days (mean, 7 days) depending on the extension of haemorrhage. In one of four patients with recurrent haemorrhage, associated systemic hypertension was found. The general condition of the three other patients was normal. In bilateral cases, two patients had spontaneous SCH and one traumatic SCH. Blood exam performed had revealed sickle cell anaemia in one patient, hypoglycaemia in one patient and *Plasmodium falciparum* in another patient.

Table 2: *Associated condition in patients with spontaneous subconjunctival haemorrhage*

Associated condition in spontaneous SCH	No. of patients (%)
Not apparent	18 (64.28)
History of hypertension	4 (14.28)
Other:	6 (21.42)
History of sickle cell anaemia	1 (3.57)
Vomiting during malaria	1 (3.57)
Sneezing	1 (3.57)
History of hypoglycaemia	1 (3.57)
History of amenorrhea	1 (3.57)
Delivery	1 (3.57)
Total	28 (100)

Table 3: *Circumstances of occurrence of ocular injury in patients with traumatic SCH*

Location of ocular injury	No. of patients (%)
Home	20 (67)
Street/highway	4 (13)
Workplace	1 (3)
School/daycare	5 (17)
Total	30 (100)

Among the 30 patients with spontaneous SCH, hypertension was the most common predisposing cause (associated condition) in four (14.3%) patients (Table 2). Among the 28 patients with traumatic SCH, 66.7% injuries had occurred at home, 30% at school or outside (Table 3). Sixty percent of all ocular injuries were caused by assault and fight, and 40% were related to an accidental struck by an object.

DISCUSSION

SCHs are common conditions in ophthalmology [1,3,8]. In this study, frequency of traumatic and spontaneous SCH was 0.8%. This is lower than in a previous study by Fukuyuma et al [3], reporting a frequency of SCH of 2.9% in 8,726 patients examined in patient eye clinics [3].

The mean age of patients with traumatic SCH (26.4 years) and spontaneous SCH (35.3 years) found in our study is lower than the mean age of 53 years reported by Pitts et al in a case control study [8]. Fukiyama et al [3] reported a mean age of 46 years.

Previous studies have shown no sexual predilection [3,8]. Surprisingly, in this current study SCH was found more frequently in females than males in traumatic SCH as well as in spontaneous SCH. The higher risk in female is probably related to the more aggressive/assaultive behavior in male [4].

In SCH, the haemorrhage itself is an obvious, sharply outlined red spot on the sclera. The entire white part of the eye may be covered by blood [2, 6]. Most often, no additional symptoms are associated with this condition. Often it happens that a person may discover and first

notice SCH on awakening and when looking in a mirror. Many patients become alarmed by its appearance. As the haemorrhage resolves, some people may experience a very mild irritation of the eye. In this study, presenting signs were similar for the two groups and included red eye (76%), decreased visual acuity (12%), eyelid swelling (6%) and itching (6%).

The condition is nearly always unilateral [2] as it was the case in 90% of the eyes in our study. In our study, 43% of all patients with SCH and only 27% of 30 patients with traumatic SCH presented within 48 hours confirming the late time of presentation reported in a previous study [9]. Compared to spontaneous SCH, there appeared to be a significant delay in time to presentation in traumatic SCH as the mean time to presentation was three days in spontaneous SCH compared with five days in traumatic SCH. Patients with spontaneous SCH consulted early, because they were probably more alarmed as the cause of their condition was unknown.

Causes of SCH are well known [1,3,5,7,10]. Subconjunctival haemorrhages can occur following trauma [3]. In this study, of 58 patients with SCH, traumatic SCH occurred in 30 (52%) of patients. In most cases, it was a minor trauma and home-related injuries were the most important source, accounting for 67%. The high level of housewives in our patient population probably plays a role in this finding. In the study by Fukuyuma et al, traumatic SCH occurred in 78 (31%) of all patients with SCH; in all the cases, it was a minor trauma [3].

SCH not caused by direct ocular trauma is usually the result of a sudden increase in intrathoracic pressure (associated with Valsalva's maneuver), as in sneezing, coughing, vomiting, or straining to evacuate [stool or nose]. Under this stress, the weak-walled conjunctival vessels may burst, especially in the elderly [6,7,11-13].

The following events can also occasionally result in a SCH: eye rubbing, high blood pressure, bleeding disorder, severe eye infection (conjunctivitis) and long-term anticoagulation therapy [1, 5, 7, 14].

SCH can also be related to malaria [15], to other febrile systemic infections [5, 9, 16, 17], or to carotid-cavernous fistula [18]. A SCH is common in newborn infants. In this case, the condition commonly occurs during vaginal delivery and is thought to be caused by the pressure changes across the infant's body during childbirth. Jain et al reported a 1.7% prevalence of SCH in newborns as a result of the normal birth process [19]. Castro et al reported a high prevalence of 46.3% in neonates [20]. This complication is transient and SCH beyond the first 2 weeks of life should be considered suspicious [21]. SCH is a common finding in child abuse, occurring in 4% to 10% of patients [21-23].

In our study, hypertension was the most frequent associated condition of spontaneous SCH. This finding is consistent with a previous study by Pitts showing a relationship between spontaneous SCH and hypertension [8]. Other associated conditions found in our study were rare and included vomiting, sneezing, malaria, hypoglycaemia, sickle cell disease and delivery.

In conclusion, traumatic and spontaneous SCH in this study were seen in 0.8% of consulting patients in a general urban practice of ophthalmology, happened in younger patients and occurred more frequently in women than in men.

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We address our acknowledgements to Prof Frank Buntinx who reviewed the manuscript.

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