

Association Between ABO Blood Group and Non-traumatic Spontaneous Subconjunctival Haemorrhage

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ABSTRACT

Purpose: To explain the relationship between blood groups and subconjunctival haemorrhage (SCH).

Materials and Methods: Four-hundred and fifty-seven subjects were included in this prospective cohort study. The demographic characteristics, systemic diseases and blood groups of the patients with SCH who had spontaneous, non-traumatic and non-infectious causes and the patients who applied to the outpatient clinic consecutively were compared using multiple regression analysis.

Results: Eighty-two patients (17.9%) had SCH. Of these 82 SCH patients, 56 (68.3%) were female and 40 (48.8%) had blood group 0. Thirty (36.6%) patients had a history of anticoagulant medication, 50 (61%) had hypertension (HT) and 21 (25.6%) had diabetes mellitus. Multivariate analysis demonstrated that the presence of blood group 0, HT and anticoagulant were effective in the formation of SCH (OR 2.453 95% CI 1.467–4.101 p = 0.001, OR 2.653 95% CI 1.491–4.652 p = 0.001, OR 2.454 95% CI 1.309–4.598 p = 0.005, respectively)

Conclusion: SCH is observed more in patients with blood group 0.

Keywords: Subconjunctival haemorrhage, blood group, multiple regression analysis, hypertension.

INTRODUCTION

Subconjunctival haemorrhage (SCH) is a common, painless, sharply circumscribed and circular benign condition characterized by bleeding under the conjunctiva. The detection of SCH constitutes an important part of emergency service applications.¹ The aetiology of SCH has also changed over the last 30 to 40 years. Previous publications have highlighted local trauma, hypertension and acute conjunctivitis, whereas recent publications have shown that contact lens use, atherosclerosis, diabetes mellitus and systemic vascular diseases are the main causes of SCH.²⁻⁸ However, the majority of SCH patients are idiopathic and the underlying cause is unclear, suggesting that other bleeding facilitating factors may exist.

Although SCH is common, there are few studies on idiopathic group.^{1,9} Cagini et al.¹ investigated the relationship between haemostatic changes and recurrent spontaneous SCHs and found no significant relationship. The relationship between blood groups and haemorrhage

has been discussed in many studies. Some research demonstrates that post-cardiac bleeding, post-peptic ulcer bleeding, postpartum haemorrhage and transfusion need are more common in patients with blood group 0.¹⁰⁻¹³ The main reason for this condition was found to be around 25 to 30% less VWF in this blood group.¹⁴

Hence, the aim of this study was to determine the causes of bleeding in non-traumatic spontaneous SCH patients and to investigate the relationship of such bleeding with blood groups.

MATERIALS AND METHODS

This retrospective cohort study was performed between January 2019 to May 2019 at Hatay State Hospital. Exclusion criteria of the study; traumatic, infectious and glaucoma-related SCHs and lack of blood group data. Patients without SCH were consecutively included in the study as a control group. Demographic characteristics, systemic diseases, blood groups, complete ophthalmologic

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examinations and history of drug use were recorded. Patients with idiopathic SCH were referred to general physicians and advanced examinations were performed for diseases such as hypertension. The patients were divided into two groups according to blood groups as 0 (group 1) and non-0 (group 2).

A Chi-square test was used for categorical variables and continuous variables were evaluated by an independent t test. In addition, to evaluate the independent relationships between blood type and each outcome, univariate and multivariate logistic regression models were applied, including adjusting for patients' characteristics. Odds ratio (OR) and 95 % confidence intervals (CI) are reported. A p value<0.05 was considered statistically significant. Analyses were carried out using SPSS software package version 20.0 (IBM, Armonk, NY).

RESULTS

A total of 457 people were included in the study. The mean age of 143 subjects with 0 blood group was 53.69 ± 16.03

years, and the mean age of 314 persons with non-0 blood group was 53.47 ± 12.33 years—there was no significant difference between the groups in terms of age (p = 0.872) The characteristics of the groups are given in Table 1. Of the 82 (17.9%) patients with SCH, 56 (68.3%) were female and the mean age of women was 50.76 ± 15.70 years, with the mean age of men being 52.34 ± 15.57 years. Characteristic features of patients with SCH are provided in Figure 1. According to univariate analysis, the presence of blood group 0, HT and anticoagulant use are effective in the formation of SCH (OR 2.515 95% CI 1.543–4.100 p <0.001, OR 3.868 95% CI 2.350–6.349 p <0.001, OR 4.126 95% CI 2.393–7.117 p <0.001, respectively) Multivariate analysis showed that the presence of blood group 0, HT and anticoagulant use were effective in the formation of SCH (OR 2.453 95% CI 1.467–4.101 p = 0.001, OR 2.653 95% CI 1.491–4.652 p = 0.001, OR 2.454 95% CI 1.309–4.598 p = 0.005, respectively) (Table 2) After exclusion of HT and anticoagulant use, 32 (39%) patients had no clear cause of SCH formation.

Table 1: Patients characteristics.

	0 blood group (n=143)	Non-0 blood group (n=314)	p value
Age (years)	53.69±16.03	53.47±12.33	0.872
Sex (female/male)	97/46	176/138	0.018
SCH	40 (%28.8)	42 (%13.4)	<0.001
HT	58 (%40.6)	100 (%31.8)	0.072
DM	48 (%33.6)	63 (%20.1)	0.002
Anticoagulant drugs usage	27 (%18.9)	49 (%15.6)	0.417

SCH: subconjunctival hemorrhage, HT: hypertension, DM: diabetes mellitus.

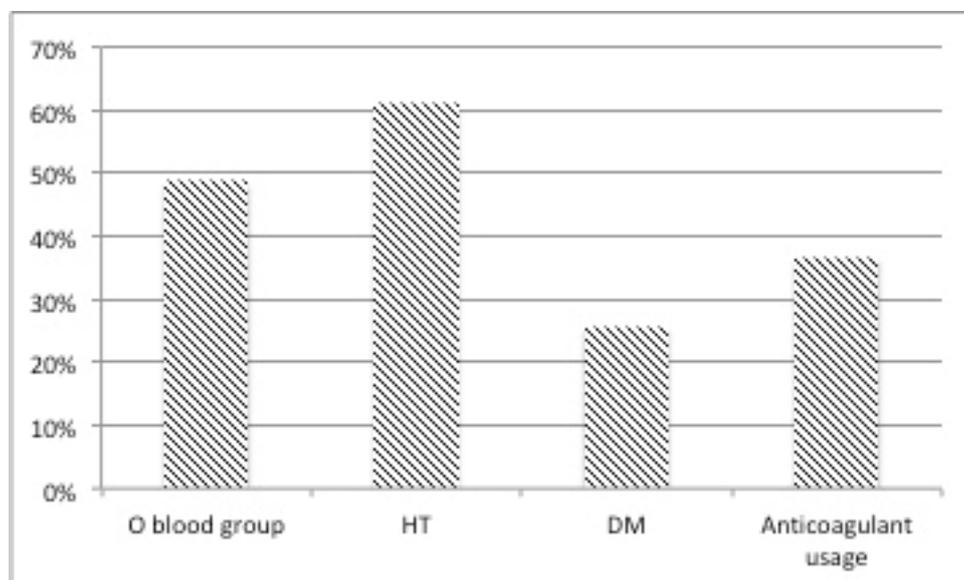


Figure 1: Characteristic features of patients with subconjunctival haemorrhage.

Table 2: Univariable and multivariable logistic regression models for subconjunctival hemorrhage.

	Univariable			Multivariable		
	OR	CI 95%	P value	OR	CI	P value
age	1.015	0.997-1.033	0.095			
Sex (female)	1.568	0.943-2.067	0.083			
Blood group (0)	2.515	1.543-4.100	<0.001	2.453	1.467-4.101	0.001
HT	3.868	2.350-6.349	<0.001	2.634	1.491-4.652	0.001
DM	1.090	0.629-1.889	0.758			
Anticoagulant usage	4.126	2.392-7.117	<0.001	2.454	1.309-4.598	0.005

HT: hypertension, DM: diabetes mellitus, OR: odds ratio, CI: confidence interval

DISCUSSION

In our study, it was observed that people with blood group 0 had more SCH than those with a non-0 blood group. The presence of HT and the use of anticoagulants are also important factors in the formation of SCH.

Studies on the aetiology of SCH demonstrate that different causes of this disease have come to the forefront from past to present. In previous works, hypertension and acute conjunctivitis are the main causes.^{2,3} More recent studies have indicated that systemic diseases are the most important causes of SCH in addition to trauma and contact lenses.^{4,8} Research has shown that trauma causes a wide range of SCH (between 8.7 to 68%).^{1,6,8} We suggest that this difference is significantly affected by the socioeconomic and cultural level of the study population. We excluded trauma-induced SCHs from the analysis because we investigated the blood group effect.

In the studies performed, the prevalence of spontaneous SCH varies by between 22 to 86.7%.^{1,6,8} In our work, this rate was 17.9%. We observed that spontaneous SCH is more common in women, in accordance with Keşkek et al.⁶ HT has been shown to be the most important factor in the aetiology of spontaneous SCH; this rate has been found to vary between 25% and 55%.¹⁻⁸ In our study, this rate was 61%. The sociocultural levels of the study groups and access to a doctor may be the reason for the difference in these rates. After excluding all known causes, the underlying cause could be detected in a significant proportion of the patients; in the Mimura et al. study, this proportion was 22.3%,⁸ whereas we determined this rate to be 39%. Cagini et al.¹ investigated the effect of haemostatic change in this case but found no significant results. Parmegiani et al.⁹ showed that factor XIII Val34Leu polymorphism was higher in patients with SCH. We propose that blood groups are effective in the idiopathic patient group. In our study,

we found that people with blood group 0 were 2.4 times more likely to develop SCH. Many analyses have found that people with this blood group are more likely to bleed. In the meta-analysis of Dentali et al.,¹⁵ haemorrhage was found 1.33 times more in people with blood group 0, a result attributed to the presence of less WVF in patients with this particular blood group.¹⁴ WVF protects factor 8 from proteolytic degradation, and the higher incidence of SCH in patients with blood group 0 may be due to poorer functioning of this mechanism. Minor traumas or minor arterial blood pressure changes, which the patient does not notice, may result in SCH in blood group 0 patients.

The most important limiting factor of our study was its retrospective design and the number of patients included in the study. Further multicentre analyses using broad participation could reveal this relationship more clearly.

In our study, the relationship between SCH and blood group 0 was investigated for the first time. Particularly in the patient group whose aetiology cannot be determined, the effect of blood group 0 on the formation of SCH should be kept in mind.

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