

Association between ABO Blood Group and Epistaxis among Syrian Population

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Abstract

Background: Epistaxis is one of the most common otorhinolaryngologic emergencies in ear, nose, and throat clinics. Blood grouping is routinely done in patients with epistaxis.

Objectives: To determine the association between ABO blood type and epistaxis.

Methods: This retrospective study involved 260 patients with idiopathic epistaxis. Patients with risk factors for bleeding, including anticoagulant use, thrombocytopenia, hypertension, liver diseases, elevated bleeding time, low coagulation factor levels, or any benign/malignant tumor, were excluded from the study. Thus, only patients with idiopathic epistaxis were included in this study.

Results: The distributions of blood groups in patients with idiopathic epistaxis were

($AB < B < A < O$), with highly trending with male gender. Also, more frequent in age category 6 – 12 y, 13 – 20 y, 1 – 5 y, 46 – 70 y, 21 – 45 y respectively, with no previous history of nasal trauma (71.92%). Most of patients were no correlation with nasal disorders or deformity (73.84 %), also vast majority of them need no intervention for epistaxis i.e., conservative treatment (81.15 %).

Conclusions: Our study indicates that in the Syrian population, the O blood type is over-represented in patients with idiopathic epistaxis versus the general population. We conclude that blood type O is a risk factor for idiopathic epistaxis in the Syrian population.

Key words: Epistaxis, blood group, von Willebrand factor, otorhinolaryngology emergencies, Syria

Introduction

Epistaxis is a frequent presentation in ear, nose,

and throat clinics. Approximately 60% of adults experience at least one episode of epistaxis in their lifetimes^{1,2,3}. In rare cases, this condition may cause massive bleeding and even death. Although epistaxis can originate in the anterior or posterior nasal cavity⁴, it usually originates in the anterior nasal cavity. History taking, physical examination,

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and laboratory tests are generally sufficient to determine the cause of bleeding. Although local and systemic processes can play a role in epistaxis, the condition can also be idiopathic.

ABO blood typing is an easily available laboratory test that is particularly important for blood transfusion and organ transplantation. ABO antigens are expressed not only on red blood-cell membranes, where they determine transfusion compatibility, but also on the surfaces of other human cells, including epithelial cells, platelets, and vascular endothelial cells, motivating

investigations of the involvement of ABO types in cardiovascular disease and postoperative

outcomes⁵. Type-O blood is associated with diminished circulating levels of factor VIII (FVIII) and von Willebrand factor (vWF), which are constituents of the intrinsic clotting pathway^{6,7,8} (Figure 1). Decreased levels of these factors are associated with a relatively high risk of bleeding.

Numerous studies have investigated the relationship between ABO blood types and hemorrhage and have established that some patients with certain blood groups are at risk for bleeding from various body sites^{9,10}. Therefore, in the present study, we aimed to determine whether there was an association between blood type and the incidence of idiopathic epistaxis in the Syrian population.

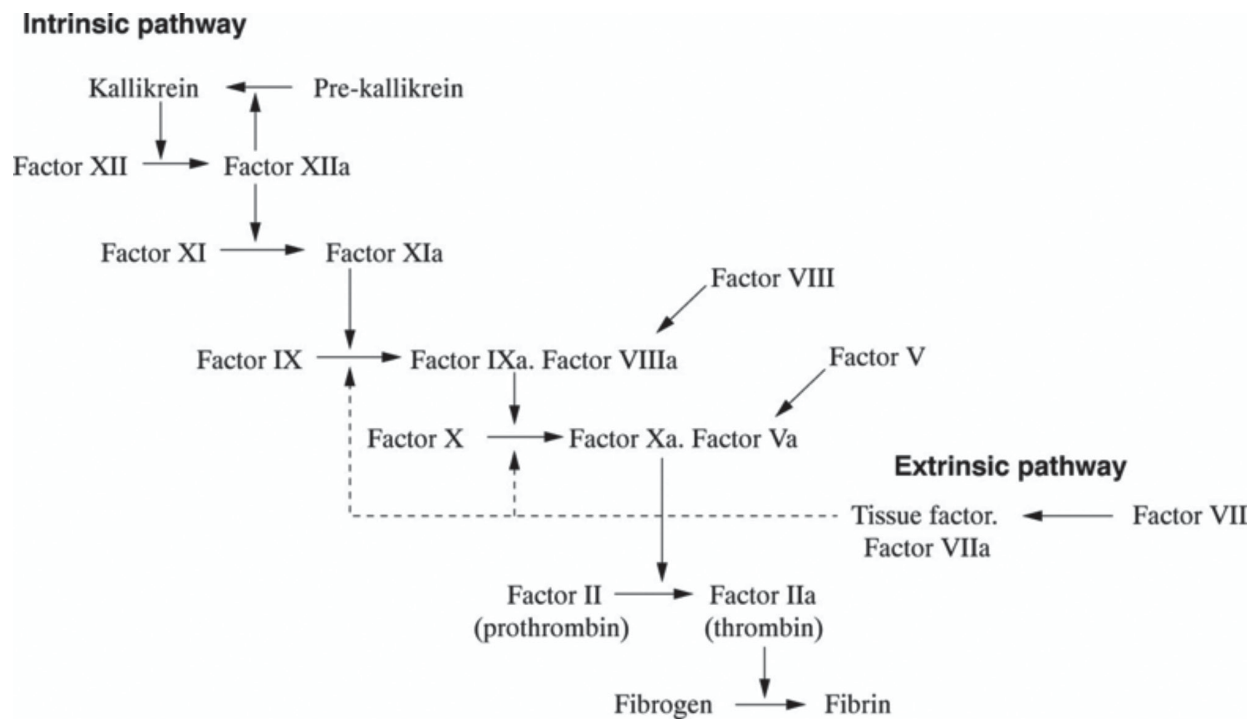


Figure 1: Components of the coagulation pathway

Materials and Methods

This retrospective study involved 260 patients who were admitted to the Ear, Nose, and Throat

departments of Jiser al shogour National Hospital, Edlib Governorate, Syria, with complaints of epistaxis between January 2013 and January

2015. Patients with risk factors for bleeding, including anticoagulant use, thrombocytopenia, hypertension, elevated bleeding time, low coagulation factor levels, or any benign/ malignant tumor, were excluded from the study. In this way, we only included patients with idiopathic epistaxis in order to eliminate the effects of known risk factors for epistaxis. Informed consent was taken for the study and local ethical committee had no objection to do this study. Statistical analysis was done by simple manual analysis and chi square test. In this study we divided patients according of sex and categorized under 5 categories. Also, we study the relation between the epistaxis and common nasal disorder and past history of nasal trauma and

main routs of treatment.

Results

The distribution of blood types:

Distribution of the sample by blood group shows a relatively normal pattern dominated by type O and type A blood group. These two types comprised the vast majority of the sample. In this respect this could be interpreted to indicate the research sample of the Syrian population under consideration. Research indicates that while type O blood group is associated with lower risks at heart diseases it does have characteristics associated with higher risk of bleeding

(Table 1): O <A<B and AB

Blood Group	A	B	AB	O
No of Pt	89	41	27	103
Percentage	34.23 %	15.7 %	10.38 %	39.61 %

Gender Distribution:

Males represented by 77.69% of the idiopathic epistaxis sample whereas females represented by 22.30%. when the Syrian population is analyzed by age, males outnumber females in the 1-20years old age group. The average age research sample (as discussed below) is leaning towards younger participants in the same age group.

(Tab-2)

Gender	Male	Female
Number (260)	202	58
Percentage	77.69 %	22.30 %

Age Distribution was as below:

The greatest representation in the sample is in the 6-12 years old age group. However, a full 76.91 of the sample is in the 0-20 years old group. As mentioned previously the age group of Syrian

patients that the study is based on contains more males than females. The high representation of young patients in the sample may indicate reduced likelihood of Idiopathic epistaxis episodes with age. It does not indicate causation for this trend.

(Tab-3)

Age	1 – 5 y	6 – 12 y	13 – 20 y	21 – 45 y	46 – 70 y
No of Pts	52	80	68	17	43
Percentage	20 %	30.76 %	26.15 %	6.53 %	16.53 %

Distribution of most associated nasal disorders:

Almost 74% of the sample reported on history of nasal disorders while the remain 26.14% reported one of three different nasal disorders. That is Deviated Nasal Septum, Sinusitis and Allergic Rhinitis.

(Tab-4)

Associated nasal disorder	Deviated Nasal Septum	Sinusitis	Allergic Rhinitis	Non
No of Pt	36	24	8	192
Percentage %	13.84 %	9.23 %	3.07 %	73.84 %

Distribution according of past history of nasal trauma:

Almost 72% of the sample reported no previous nasal trauma indicating previous injury is not a contributing factor of the epistaxis episodes.

The high percentage of the sample with no evidence of nasal disorder and without pervious trauma of external causation may indicate a possible internal predisposition of these bleeding episodes.

(Tab-5)

History of nasal Trauma	-ve	+ve
No of Pts	187	73
Percentage %	71.92%	28.07%

Distribution according to main rout of therapy:

Over 81% of the sample reported that their bleeding episodes required minimal medical

intervention or treatment. The remaining patients reported more drastic treatment was required such as nasal packing and cautery

(Tab-6)

Type of Therapy	Conservative	Ant Nasal Packing	Nasal Cautery
No of Pt	211	13	36
Percentage %	81.15 %	5 %	13.84 %

Discussion

The ABO gene encodes several glycosyltransferases that attach sugar residues to the H (O) antigen to form the A and B antigens. These antigens exist on Blood type of epistaxis the surface of vWF, a transporter protein for FVIII^{11,12}. High levels of vWF and FVIII are known to increase the risk of thrombosis¹². Wiggins *et al*¹³ hypothesized that compared with the O allele, the A1 and B alleles are associated with an increased risk of arterial and venous thrombosis. The authors also reported a relationship between ABO alleles and hemorrhagic stroke¹³.

Moeller *et al*¹⁴ compared vWF and FVIII levels in individuals with different ABO phenotypes and found that vWF levels increased in the order O < A < B < AB and FVIII levels increased in the order O<A<AB<B. The O blood type is associated with both increased bleeding and activated partial thromboplastin time, which indicate the involvement of the entire coagulation pathway and the extrinsic coagulation pathway, respectively¹⁵.

These associations are the result of a decrease in the circulating levels of FVIII and vWF, which are constituents of the intrinsic coagulation pathway. Variability in the circulating levels of these factors is directly linked to the ABO genotype. Compared with A/A homozygotes, O/O homozygotes exhibit 34% lower vWF levels and 20% lower FVIII levels. In addition, compared with A/O and B/O heterozygotes, O/O homozygotes harbor 4% and 13% lower vWF levels, respectively, and 1% and 5% lower FVIII levels, respectively⁶.

Numerous studies have investigated the relationship between ABO blood type and bleeding at various body sites. Leonard *et al.*⁹ investigated the relationship between ABO blood type and secondary post-tonsillectomy hemorrhage; they found that type-O blood may be over-represented in patients presenting with secondary bleeds. Therefore, they suggested that patients with type-O blood were more likely to suffer from secondary bleeds after tonsillectomy.⁹ Bayan *et al.*¹⁰ researched the relationship between ABO

blood type and upper gastrointestinal bleeding and reported that the O blood type plays a significant role in upper gastrointestinal bleeding. However, Halonen et al.¹⁶ investigated the relationship of blood type and certain coagulation parameters with bleeding tendencies in 354 patients undergoing abdominal and urological surgery and found that the O blood type did not significantly impact intraoperative bleeding tendency.

Although Reddy *et al.*¹⁷ reported that the O blood type is a risk factor for epistaxis in Caucasian patients, no exclusion criteria were reported in their study. To conclusively determine that a parameter is a risk factor, other risk factors must be excluded. In the present study, we excluded other risk factors for epistaxis and included only patients with idiopathic epistaxis. Furthermore, the distribution of blood types differs between races. The most common blood type in Caucasians is O, whereas in the Syrian population, the most common blood type is A¹⁸. To the best of our knowledge, the current study is the first to evaluate the relationship between blood type and epistaxis in the Syrian population. Our finding that the O blood type is a risk factor for epistaxis is consistent with the findings of Reddy *et al.*,¹⁷ which was conducted in Caucasian patients.

Also, According to MILLER et al study, Blood group O is associated with a lower expression of von Willebrand compared with non O blood groups. Individuals with blood group O are more likely to be diagnosed as having a mild form of von Willebrand disease⁸. This recent study also showed that blood group O is predominantly significant in patients with epistaxis compared with non O blood group.

Conclusion

In summary, the O blood type has been associated with decreased circulating levels of FVIII and vWF, which have been reported to disrupt the functioning of the intrinsic coagulation pathway and increase the risk of bleeding. Our study is the first to evaluate the relationship between blood type and idiopathic epistaxis in the Syrian population. Our findings demonstrate that compared to the general population, the O blood type is over-represented in Syrian patients with idiopathic epistaxis. Further studies including different races are required to confirm this relationship and to determine the association(s) between severe and persistent epistaxis and ABO blood type. Also, we found its more common in male gender and in age category 6 – 12 years with no correlation with most nasal diseases or past history of nasal trauma and most way of treatment was conservative therapy

Ethical Clearance -Taken from Research Department in (territory of health in Edlib Governate)- branch of M.P.H

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