

Association of Acne Vulgaris and ABO Blood Groups

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Abstract

Background: Studies of associations between various skin diseases and the ABO blood groups have showed conflicting results. Acne vulgaris is a common chronic inflammatory skin disease. The pathogenesis of acne is only partially understood, but it is multifactorial and complex. So far no study has been performed to evaluate the association of acne with blood groups.

Objective: We conducted a cross-sectional study to investigate the probable association of ABO blood groups with acne vulgaris.

Materials and methods: This cross-sectional study conducted in university affiliated dermatology clinics and involved 124 patients with acne and 425 healthy controls. The diagnosis of acne and severity was based on clinical criteria and dermatologic examination. For all participants blood samples were collected and tested for ABO blood groups and Rh factor. The distribution of ABO and Rh blood type for cases was compared with that of healthy controls.

Results: The age ($p=0.101$) and gender ($p=0.339$) distribution of both groups was not statistically difference. Our finding showed that there was no statistically significant association between the acne vulgaris and ABO blood groups ($P=0.336$) or Rh factor ($p=0.738$). Also, there was not significant association between severity of acne and blood groups ($p=0.807$).

Conclusion: Our study showed lack of significant association of ABO blood groups with acne vulgaris. Further studies in larger series and in other ethnic groups are recommended.

Introduction

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit that may persist for many years. The clinical features of acne include seborrhoea, non-inflammatory lesions, inflammatory lesions, and various degrees of scarring [1]. Acne mainly effects adolescents but, it is also present in children and adults. The disease is important, with a significant psychological effect on patients' quality of life and self-esteem [2].

The pathogenesis of acne is only partially understood, but it has been accepted that it is multifactorial and complex. It consists of abnormal keratinization, abnormal activity of the sebaceous, hormonal functions, bacterial growth, and immune hypersensitivity [3].

Genetic factors are also mentioned in the pathogenesis of acne and some studies especially on twins have shown that genetic factors influence susceptibility to this disease [4, 5].

One of the most important human genetic characteristic is the blood group. Blood group antigens are present on the surface of red blood cells and various epithelial cells. There are two main antigens, A and B, in the ABO system. The presence or absence of these antigens results in the four blood groups: A, B, AB, and O [6].

Associations between ABO blood groups and incidence or prognosis of some diseases are documented in the medical literature. On the other hand some studies reported controversial or no association between ABO blood group with number of diseases [7]. The early statistical associations with diseases that are of the most interest are those with malignancies, peptic ulcer, and some infectious diseases [8].

The data on association between the ABO blood types and skin diseases is conflicting. Some studies reporting no association between ABO blood group and skin diseases [9, 10, 11]. In contrast others studies showed significant association [12, 13].

Because genetic factors are mentioned in the pathogenesis of acne, we hypothesized there may be an association between blood groups and acne. Additionally, ABO genes are distributed differently among socioeconomic groups and we know that socioeconomic status is one of the risk factors for disease. To our knowledge, no report has evaluated the relationship between the ABO blood groups and the acne vulgaris. Therefore, this study was designed to investigate this probable relationship.

Materials and Methods

Subjects: This cross-sectional study was conducted during period from January 2011 to February 2012 in the dermatology clinics of Semnan University of Medical Science, Iran. In this study, 124 patients with acne and 425 ages

and gender matched control subjects were enrolled. The diagnosis of acne was based on clinical criteria and dermatologic examination. Acne severity was rated according to the Combined Acne Severity Classification that classifies acne into mild, moderate, and severe, based on the number and type of lesions [14]. The control subjects were selected from the healthy people with no history of acne vulgaris from the same geographic area.

Data about age and gender of all participants were collected. For all subjects blood samples were obtained into tubes containing EDTA. ABO blood group was determined using tube method by corresponding antisera (Cinnaclone 2. Ciinagen, Iran).

Patients with drug-induced acneiform eruptions, patients who used topical or systemic antibiotic during previous month, those taking OCP and pregnant women were excluded. The study was approved by the Research and Ethics Committee of Semnan University of Medical sciences. Written informed consent was obtained from all participants. The distribution of ABO and Rh blood type for cases was compared with that of healthy control.

Statistical analysis: Statistical analyses were performed by *Kolmogorov-Smirnov*, *Student t* and *Chi-square* test using SPSS for Windows version 18.0. The p-value less than 0.05 were considered statistically significant.

Results

Of the 124 patients included with acne, 35 (28.2%) were men and 89 (71.8%) were women. Among controls, 102 (24%) were men and 323 (76%) were women. The gender distribution of both groups was not statistically difference ($p=0.339$). The mean age was 22.3 ± 4.8 for patients and 23.1 ± 5.7 for controls ($p=0.101$). The age distribution of patients and control are given in table 1.

The most common blood group among the patients was A (38.7%), while among controls was O (35.8%). The distribution of ABO blood

Table 1. Age Distribution of Patients and Controls

Group	Age (Year)					
	<20		20-29		30≤	
	n	%	n	%	n	%
Acne	37	29.8	75	60.5	12	9.7
Control	123	28.9	236	55.5	66	15.5

groups in the acne vulgaris group and control showed no significant difference (P=0.336) (Table 2).

When the studied patients were grouped by sex, again there was no significant relationship for women (p=0.170) and men (p=0.108).

Among subjects with acne 90.3% and among control 91.3% were Rh positive respectively. The distribution of Rh factor among cases and controls did not differ significantly (p=0.738).

The severity of acne in patients was as follow: mild 13.7%, moderate 41.9% and sever 44.4%. Also when comparing the severity of acne, there was no significant association between ABO blood group (p=0.807) or Rh factor (p=0.937) and severity of acne.

Discussion

The mean (± standard deviation) age of our patients with acne was 22.3±4.8 years that are in accordance with some other studies. In Jung and co-worker study the mean age of the subjects was 24.0 years [15]. In Adityan and Thappa study the reported mean age was 19.78 years [16]. On the other hand in Lasek and Chren study the mean age of patients was higher (31 ± 10.1 years) [17].

Prevalence data about acne show that gender distribution is different from study to study which may be related to population and time of study. In our study, acne was more common in female patients (71.8%) than males (28.2%) which are similar to some other reports [17, 18, 19].

On the other hand, some other studies reported that acne is equal in both sex or more common in male [20, 21, 22].

In our patients, we observed no significant association between acne vulgaris and ABO

blood types. Although blood group B among patients with acne vulgaris was higher and group O was lower than the corresponding controls, these differences were not statistically significant.

The reports so far published on the association of ABO blood groups with skin diseases have yielded different results. Some authors reported that some skin diseases are more common in some blood group. Whereas, some other studies report no association between ABO blood group with skin diseases.

In a study on two large independent populations, non-O blood group was associated with a decreased risk of skin cancer. The association was statistically significant for non-melanoma skin cancer [13]. In another study, the distribution of different blood groups between patients with atopic dermatitis and controls showed that blood group O was significantly less common among patients than among controls [12]. Balajee et al studied 108 patients with dermatophytosis and suggested that A blood group subjects may be prone to chronic dermatophytosis [23]. In contrast, Tursen and his colleagues reported that their finding showed no significant association of ABO blood groups with skin cancers [24]. Two studies showed that there was not any significant association of ABO blood groups with vitiligo [10, 25]. Tamega et al reported in a study on patients with discoid lupus erythematosus that ABO and Rh blood groups exhibit similar frequencies in patients as in the general population [9]. The results obtained in a study showed that, although a larger number of patients belonging to blood group A infected by Trychophyton rubrum, there was no statistical evidence that those individuals were more susceptible to dermatophytosis [11].

No relation was found in the current study between Rh factor and acne vulgaris. This

Table 2. Distribution of Blood Groups in Patients and in Controls

Blood groups	Acne (n=124)		Control (n=425)	
	n	%	n	%
A	48	38.7	151	35.5
B	32	25.8	88	20.7
O	34	27.4	152	35.8
AB	10	8.1	34	8.0

study also revealed the nonsignificant association of any blood group with the severity of acne.

There are some limitations to our study. These included the selection of cases from clinics and not from the general population and the other limitation is small sample of patients thus limiting the possibility of stronger statistical analysis.

In conclusion, our study showed lack of significant association of ABO blood groups with acne vulgaris. Further studies with larger sample and in other ethnic groups are recommended to investigate and elucidate the relationship between blood group antigens and acne.

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