

# ABO blood group antigens in patients with psoriasis and pemphigus vulgaris

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**Background:** The ABO blood group antigens play a role in the pathophysiology of some diseases and several researches have investigated this relationship in the field of dermatology. In the present study, an attempt was made to find the distribution of blood types in patients with pemphigus vulgaris and chronic plaque type psoriasis.

**Method:** Fifty patients with chronic plaque type psoriasis, 50 patients with pemphigus vulgaris and 100 healthy persons as control group, were selected as the study population. ABO blood grouping was determined by the cell type tube test method, using standard commercial anti/A, anti/B and 5% suspension of red blood cells. Chi square test was used to compare the frequency of ABO blood groups in patients and control groups.

**Result:** Among the 50 patients with psoriasis, 21 (42%) had blood group O, 15 (30%) blood group A, 10 (20%) blood group B and 8 (4%) had blood group AB. Among the 50 patients in the pemphigus group, 22 (44%) had blood group O, 19 (38%) blood group A, 8 (16%) blood group B and 1 (2%) had blood group AB. The distribution of blood groups in patients with these two diseases was not significantly different from the control group.

**Conclusion:** Despite some researches, which found associations between blood group antigens and psoriasis or pemphigus, this study did not find any such relationship.

**Keywords:** ABO blood group, psoriasis, pemphigus vulgaris, skin disease

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## INTRODUCTION

The notion that a relationship exists between the ABO blood group antigens and various disorders is not new. Some years ago, attempts were made to find the relationship between blood group antigens and different diseases. The oldest researches are on the association of ABO blood groups and malignancy<sup>1</sup>, blood group O in duodenal ulcer<sup>2</sup>, blood group A with gastric cancer<sup>3</sup>, blood group O with peptic ulcer<sup>4</sup>, toxemia of pregnancy and blood group O<sup>5</sup> and carcinoma of the cervix with blood group AB<sup>6</sup>.

In the field of dermatology, possible relationships have been sought in disorders such as lichen

planus, oral cancer, vitiligo, pemphigus, psoriasis, etc. Two of the most common diseases studied in dermatology were selected, psoriasis and pemphigus vulgaris, to determine whether any relationship exists between these two diseases and the ABO blood groups.

## PATIENTS AND METHODS

Fifty patients with chronic plaque type psoriasis, 50 patients with pemphigus vulgaris and 100 healthy persons (as a control group), were selected as the study population. Control subjects were selected from patients who came to the dermatology clinic for reasons other than inflammatory diseases e.g.

cosmetic procedure. Patients were visited in the Department of Dermatology, at Tajrish Hospital. Patients with chronic plaque type psoriasis lasting more than 6 months were included in the study. Diagnosis of pemphigus was based on clinical, histopathology, and direct immunofluorescence studies. The ABO blood grouping was determined by cell type tube test method, using anti A, anti B and 5% suspension of red blood cells. According to the agglutination pattern, the specimens were classified as A, B, AB, and O blood groups<sup>7</sup>. Chi-square test was used to compare the frequency of ABO blood groups in patients with pemphigus vulgaris and psoriasis, with the control group.

## RESULTS

The study population consists of 50 patients in each group (psoriasis and pemphigus) and 100 healthy controls. The demographic information of patients

and the control group are shown in Tables 1 and 2. In the psoriasis group, all patients had chronic plaque type psoriasis and in the pemphigus group, 8 (16%) had cutaneous, 17 (34%) mucosal and 25 (50%) had mucocutaneous phenotype. Figures 1 and 2 show the distribution of the ABO blood group among cases and control. Among the 50 patients with psoriasis, 21 (42%) had blood group O, 15 (30%) blood group A, 10 (20%) blood group B and 8 (4%) had blood group AB. Among the 50 patients in the pemphigus group, 22 (44%) had blood group O, 19 (38%) blood group A, 8 (16%) blood group B and 1 (2%) had blood group AB. The frequencies of blood type A, B, AB and O among control groups were 34, 19, 4 and 43%, respectively. When the case and control groups were compared, no statistically significant difference was detected between the psoriasis and control groups ( $P=0.654$ ), also there was no statistically significant difference between the pemphigus and control groups ( $P=0.763$ ).

**Table 1.** Baseline demographics and clinical characteristics of patients with pemphigus and healthy controls

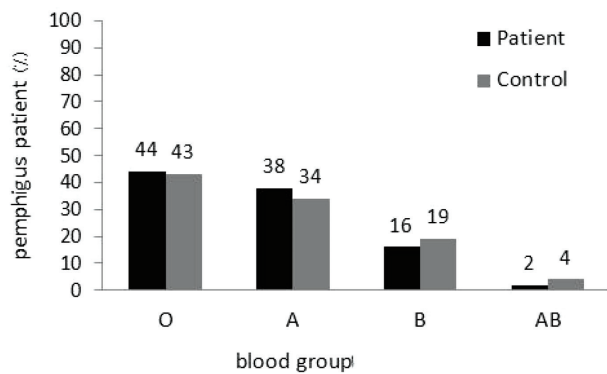
Characteristic	Patients with pemphigus (n=50)	Healthy controls (n=100)	P-value
Gender			
Female	30 (60%)	57 (57%)	0.72
Male	20 (40%)	43 (43%)	
Age, years			
Mean $\pm$ SD	43.16 $\pm$ 10.58	43.25 $\pm$ 11.26	0.96
Median (range)	42 (24-64)	43 (23-68)	
Age at onset of disease, year		-	
Median (range)	39 (10-63)		
Duration of disease, year		-	
Median (range)	1 (0.02-20)		
Types of pemphigus involvement		-	
Cutaneous	1 (2%)		
Mucosal	26 (52%)		
Mucocutaneous	23 (46%)		

Values are no. (%) unless otherwise stated.

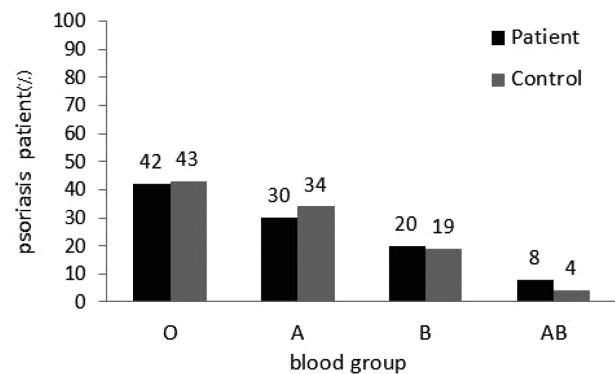
**Table 2.** Baseline demographics and clinical characteristics of patients with psoriasis and healthy controls

Characteristic	Patients with psoriasis (n=50)	Healthy controls (n=100)	P-value
Gender			
Female	29 (58%)	57 (57%)	0.91
Male	21 (42%)	43 (43%)	
Age, years			
Mean $\pm$ SD	43.12 $\pm$ 10.89	43.25 $\pm$ 11.26	0.94
Median (range)	42.5 (23-63)	43 (23-68)	
Age at onset of disease, year		-	
Mean $\pm$ SD	37.93 $\pm$ 12.00		
Duration of disease, year		-	
Median (range)	3 (0.5-20)		

Values are no. (%) unless otherwise stated.



**Figure 1.** Distribution of ABO blood group in pemphigus vulgaris and control group



**Figure 2.** Distribution of ABO blood group in psoriasis and control group

## DISCUSSION

Genetic factors like blood group antigens may have influence on the severity and development of some diseases, and many researches have shown elevated risk for some diseases but there is no uniform result<sup>7</sup>. In the literature, a limited number of studies found a relationship between pemphigus and psoriasis with the ABO blood groups. Therefore, this study was conducted to evaluate any relationship between the ABO blood types and these two diseases.

The well-known and medically important blood types are in the ABO blood group system. Karl Landsteiner discovered them in 1900 and 1901 at the University of Vienna, in the process of trying to learn why blood transfusions sometimes cause death and at other times save a patient. In 1910, he won a Nobel Prize for this discovery<sup>8</sup>. However, despite their obvious clinical importance, the physiological functions of the ABO blood group antigens remain a mystery. The genes that determine the A and B phenotypes are found on chromosome 9p and are expressed in a Mendelian dominant manner and they do not change as a result of environmental influences during life. Numerous associations have been made between the ABO phenotypes and an increased susceptibility to disease<sup>9</sup>.

There are several researches about the association of the ABO blood group with infectious and non-infectious diseases. In the field of dermatology, there are several studies about the relationship of the ABO blood group to dermatophytosis, oral cancer, vitiligo, psoriasis, etc. Young and Roth suggested that people with blood group A are more prone to dermatophytosis and there is cross reactivity

between glycoprotein isolated from trichophyton mentogrophytes and human isoantigens A1 and A2. Arun and Thangam also reported the same result. They found that people with blood group A have susceptibility for dermatophytosis and chronicity of the disease<sup>10</sup>. Deresinski et al reported the prevalence of coccidioidomycosis in blood group B subjects<sup>11</sup>. Tuberculoid leprosy is associated with group O, lepromatous leprosy with A and B, gonorrhoea with B, and smallpox with A and AB<sup>12</sup>.

Macswen et al studied the ABO blood groups and skin disorders; they selected 1994 patients with a variety of skin disorders such as acne, rosacea, alopecia, wart, etc. They found that seborrheic diathesis is commoner in persons with blood group B while lichen planus is commoner in blood group A subjects<sup>13</sup>.

Moshaverinia et al did not find any relationship between blood group antigens and the lichen planus. Tarun Kumer et al found that patients with blood group A were 1.28 times more likely to develop oral lichen planus<sup>13,14</sup>.

Several researches have shown that subjects with blood group A are more prone to oral cancer. In a large cohort study in the US, the ABO blood type and incidence of skin cancer including SCC, BCC and melanoma were studied. They found that non O blood group was associated with decreased risk of skin cancer, and this association was significant for non-melanoma skin cancer<sup>15</sup>.

The association between blood type and vitiligo is also controversial, as there are studies which reported that the frequency of AB blood groups is higher than other blood types in vitiligo cases<sup>16</sup>, while some other studies reported that there is no relationship between the ABO blood group

and vitiligo<sup>17,18</sup>.

There are several reports with different results about the relationship between blood type and psoriasis, some investigators suggested that blood type O is more frequent in psoriasis while other studies show no relationship between psoriasis and blood groups<sup>19,20</sup>. Altobella found that 60% of pemphigus vulgaris patients had blood group O<sup>21</sup>. Grob and Inderbitzin reported the same result, but Valikhani et al showed that the frequency of blood group in pemphigus patients is the same as in a normal population<sup>22</sup>, and Shahkar et al came to the same conclusion<sup>23</sup>.

There are several other studies about blood type and other dermatologic diseases and the role of these antigens in etiology and pathophysiology of some diseases is significant. Blood group antigens are expressed on the surface of many epithelial cells including skin cells. These antigens are fucosylated oligosaccharides that participate in several biological processes, such as tissue differentiation, cell movement, inflammation and bacterial adhesion<sup>24</sup>, but the exact mechanism of these antigens in the pathophysiology of some disease is unclear.

In this study, no significant association was found between the ABO blood groups and pemphigus vulgaris or psoriasis. The distribution of the ABO blood group varies in different geographic and ethnic groups; therefore, selecting a proper control group is difficult. This may explain why there is disagreement in the results obtained on the relationship between blood types and disorders. This study aimed at having a brief review about the importance of blood group antigens in some common skin disorders.

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