

Evaluation of ABO blood types in various dermatoses in Kashmiri population: A case-control study

Parvaiz A Rather*, Iffat Hassan*, Saima Naaz*, Farhan Rasool*, Ruby Reshi**

* Postgraduate Department of Dermatology, STD & Leprosy, Govt. Medical College, Srinagar (University of Kashmir), J & K India

** Postgraduate Department of Pathology, Govt. Medical College, Srinagar (University of Kashmir), J & K India

Abstract *Objective* To evaluate any association between various ABO blood types and different dermatoses, viz, psoriasis, vitiligo, alopecia areata and pemphigus vulgaris.

Methods This hospital-based, case-control study involved evaluation of ABO blood typing of 140 cases of psoriasis, 76 vitiligo, 84 alopecia areata and 30 pemphigus vulgaris, and 2067 controls.

Results O blood group was found in 37.1% patients of psoriasis, followed by blood type B (30%) and blood group A (25.7%), without any significant difference between cases and controls. In vitiligo patients, B blood group was found in 47.4% patients, followed by blood group O (36.8%) and blood group A (10.5%). The results between vitiligo patients and controls regarding blood group A and B were statistically significant. In alopecia areata patients, blood group B was found in 45.2% patients, followed by blood group O (28.6%) and blood group A (19%), the difference being not statistically significant. In pemphigus vulgaris patients, O and B blood group were found in 40% patients each, followed by blood group A (20%), but this was not statistically significant.

Conclusions In psoriasis patients in our study, blood group O was the most common, but without any statistical significance than the controls. In vitiligo patients, B blood group was the most common and this was statistically significant. Difference in the blood group A, although found less frequently than B and O blood group, was also statistically significant between study group and controls. In alopecia areata, B blood group was the most common, but this finding was not statistically significant when compared to controls. In pemphigus patients, blood group O and B were equally common, but this was not statistically significant than the controls.

Key words

Alopecia areata, blood groups, pemphigus, psoriasis, vitiligo.

Introduction

Antigens of the ABO blood group family have been known for a long time. The genes that

determine the A and B phenotypes are found on chromosome 9, expressed in a Mendelian co-dominant manner.¹

Studies about the susceptibility and association of a particular blood group type with a specific disease have been conducted, for example the higher association of blood group O with peptic ulcers.^{2,3} Similarly, association between blood group A and gastric cancer was reported in 1953, and since then the relationship with blood

Address for correspondence

Dr. Parvaiz Anwar Rather
Postgraduate Department of Dermatology, STD & Leprosy, Govt. Medical College, Srinagar (University of Kashmir), J & K India.
E-mail: parvaizanwar@gmail.com

groups has been studied in many cancers and other human diseases, including many autoimmune disorders such as juvenile diabetes, multiple sclerosis, rheumatoid arthritis, and celiac disease, to mention a few.⁴⁻¹⁰

Evaluation for such type of association has not been widely studied for dermatological diseases, except for some old studies in the literature,¹¹⁻¹⁹ and only few newer ones,^{20,21} and studies are not being taken up on large scale basis.

In order to revisit this forgotten subject, we conducted the present study to look for any association between various ABO blood types and psoriasis, vitiligo, alopecia areata and pemphigus vulgaris, since the inheritance of blood groups are not confounded by environmental factors, and as such they seem to be a useful source of research for human studies. These diseases were selected because of their known hereditary tendency and HLA association.

The frequencies of ABO and Rhesus (D) blood groups vary from one population to another and the genes in charge are distributed differently among different population groups.²² This further encouraged us to evaluate association of various ABO blood types with different dermatoses in Kashmiri population.

Methods

In this hospital-based, case-control study, the study group comprised of patients of psoriasis, vitiligo, alopecia areata and pemphigus vulgaris, diagnosed clinically and histopathologically at times, taken up for the study after a written informed consent, over a period of one year. Patients above the age group of 12 years were recruited for the convenience of obtaining blood

sample. ABO blood group typing was done at the blood bank of the hospital.

The results in the study group were compared with control group which consisted of ABO blood type of prospective age- and sex-matched patients who sought consultation during the same period for other dermatoses not known to have genetic or hereditary tendencies.

The data were compiled and subjected to statistical analysis using software SPSS version 16, using chi square test (X^2) and taking p value of <0.05 as significant.

Results

The study group involved 140 patients of psoriasis, 76 vitiligo, 84 alopecia areata and 30 pemphigus vulgaris. The control group consisted of 2067 patients. The demographic variables of the study group and ABO blood typing results between cases and controls are summarized in **Tables 1** and **2**, respectively.

Among the 2067 age- and sex-matched control group, most common blood group detected was blood group O, found in 733 (35.5%) patients. Out of this 670 had O positive and 63 had O negative type. Next most common blood group was blood group B, found in 729 (35.3%) patients, with 671 having B positive and 58 having B negative. Blood group A was found in 458 (22.2%) patients, A positive in 419 and A negative in 39. AB blood group was found in 147 (7.1%) patients, AB positive in 129 and AB negative in 18.

Out of the 140 patients of psoriasis, 98 (70%) were males and 42 (30%) females, with male to female sex ratio of 2.3:1. The age of psoriasis patients ranged from 13 to 70 years, with

Table 1 Demographic variables in the study group.

		<i>Psoriasis</i> (n=140)	<i>Vitiligo</i> (n=76)	<i>Alopecia areata</i> (n=84)	<i>Pemphigus vulgaris</i> (n=30)
Sex distribution	Males	98	34	56	18
	Females	42	42	28	12
	Total	140	76	84	30
	Male: female ratio	2.3:1	1.2:1	2:1	1.5:1
Age distribution (years)	13-20	32	30	18	0
	21-40	76	44	64	9
	≥41	32	2	2	21
	Mean	32.8	23.47	25.93	49.6
Residential distribution	Rural	98	44	52	27
	Urban	42	32	32	3
Mean duration of disease		6.24 years	4.89 years	4.29 months	7.4 months

Table 2 ABO blood groups in study and control groups.

<i>Blood group</i>		<i>Psoriasis</i> (n=140)	<i>Vitiligo</i> (n=76)	<i>Alopecia areata</i> (n=84)	<i>Pemphigus vulgaris</i> (n=30)	<i>Control</i> (n=2067)	<i>p value</i>
A	Total	36	8	16	6	458	Ps:0.383
	Males	26	2	12	6		Vit:0.023 (S)
	Females	10	6	4	0		AA:0.589
	Positive	36	8	16	6	419	PV:0.951
	Negative	0	0	0	0	39	
B	Total	42	36	38	12	729	Ps:0.240
	Males	36	22	26	9		Vit:0.041 (S)
	Females	6	14	12	3		AA:0.079
	Positive	36	34	36	12	671	PV:0.746
	Negative	6	2	2	0	58	
AB	Total	10	4	6	0	147	Ps:0.876
	Males	6	4	4	0		Vit:0.696
	Females	4	0	2	0		AA:0.837
	Positive	10	4	6	0	129	PV:0.248
	Negative	0	0	0	0	18	
O	Total	52	28	24	12	733	Ps:0.756
	Males	30	6	14	3		Vit:0.901
	Females	22	22	10	9		AA:0.238
	Positive	44	26	24	12	670	PV:0.746
	Negative	8	2	0	0	63	

Ps=psoriasis, Vit=vitiligo, AA=alopecia areata, PV=pemphigus vulgaris.

mean age of 32.8 years. There were 76 (54.3%) patients in the age group 21-40 years, 32 (22.9%) in the age group 13-20, and 32 (22.9%) in the age group ≥ 41 years. There were 98 (70%) patients from rural background and 42 (30%) from urban. The duration of the disease ranged from 10 days to 30 years, with an average disease duration of 6.24 years. 94 patients presented with psoriasis vulgaris, 18 with scalp psoriasis, 16 with guttate type, 8 with erythroderma, and 4 with pustular type of psoriasis.

O blood group was found in 52 (37.1%) patients of psoriasis, 30 males and 22 females. Out of this, O positive was found in 44 and O negative blood type in 8 patients. Blood type B was found in 42 (30%) patients, 36 males and 6 females. Out of this, B positive was found in 36, and B negative in 6 patients. A blood group was found in 36 (25.7%) patients, 26 males and 10 females. All these were A positive. AB blood group, all AB positive, was found in 10 (7.1%) patients, 6 males and 4 females. The blood group results of

psoriasis patients were not statistically significant when compared to control group.

Of the 76 patients of vitiligo, 42 (55.3%) were males and 34 (44.7%) females, with male to female sex ratio of 1.2:1. The age of vitiligo patients ranged from 13 to 45 years, with average age of 23.47 years (**Table 1**). There were 44 (57.9%) patients in the age range 21-40 years, 30 (39.5%) in 13-20 years, and 2 (2.6%) in the age group of ≥ 41 years. 6 patients had positive family history of vitiligo. There were 44 (57.9%) patients from rural areas and 32 (42.1%) from urban background. The duration of disease ranged from 2 months to 15 years, with average disease duration of 4.89 years. 58 patients had diffuse involvement, 10 focal, 4 acral type, 2 each had acrofacial and generalized type of vitiligo.

B blood group was found in 36 (47.4%) patients of vitiligo, 22 males, 14 females (**Table 2**). Out of these 34 had B positive and 2 had B negative blood group. Blood group O was found in 28 (36.8%) patients, 22 females and 6 males. Out of these, 26 had O positive and 2 O negative blood group. Blood group A, all A positives, was found in 8 (10.5%) patients, 6 females and 2 males. 4 (5.3%) patients, all males had blood group AB, all AB positive. The results between vitiligo patients and controls regarding blood group A and B was statistically significant, but not significant with respect to blood groups O and AB.

84 patients of alopecia areata included in the study comprised of 56 (66.7%) males and 28 (33.3%) females, with male to female sex ratio of 2:1 (**Table 1**). The age of alopecia areata patients ranged from 13 to 50 years, with average age of 25.93 years. There were 64 (76.2%) patients in the age group 21-40 years, 18 (21.4%) in 13-20 years, and 2 (2.4%) in the

age group ≥ 41 years. 52 (61.9%) patients had rural background and 32 (38.1%) urban background. The disease duration ranged from 8 days to 4 years, with an average disease duration of 4.29 months. 80 patients presented with localized disease, and 2 each with diffuse and ophiasis types.

Blood group B was found in 38 (45.3%) patients of alopecia areata, 26 males and 12 females (**Table 2**). Out of this, 36 had B positive and 2 had B negative blood group. Blood group O, all O positives, was found in 24 (28.6%) patients, 14 males and 10 females. Blood group A, all A positives, was found in 16 (19.1%) patients, 12 males and 4 females. AB blood group, all AB positives, was found in 6 (7.1%) patients, 4 males and 2 females. The difference in blood groups between alopecia areata patients and control group was not statistically significant.

30 patients of pemphigus vulgaris studied comprised of 18 (60%) males and 12 (40%) females, with a male to female sex ratio of 1.5:1 (**Table 1**). The age of pemphigus vulgaris patients ranged from 33 to 65 years, with average age of 49.6 years. 21 (70%) patients were in the age group of ≥ 41 years and 9 (30%) in 21-40 years age group. There were 27 (90%) patients from rural areas and 3 (10%) from urban areas. 18 patients presented with cutaneous and 12 with mucocutaneous involvement. The disease duration ranged from 1 month to 15 months, with an average duration of 7.4 months.

O blood group, all O positives, was found in 12 (40%) patients of pemphigus vulgaris, 9 females and 3 males (**Table 2**). B blood group, all B positives, was found in 12 (40%) patients, 9 males and 3 females. Blood group A, all A positives, was found in 6 (20%) patients, all males. No patient of pemphigus vulgaris had AB

blood group. There was no statistically significant difference between pemphigus vulgaris patients and control group regarding the ABO blood group typing.

Discussion

O blood group was the most common blood group found in 37.1% psoriasis patients in our study, followed by 30% with blood group B, however, the results in psoriasis patients in our study showed no statistically significant correlation between preponderance of any blood group as compared to the controls, similar to an old study by Hargreaves *et al.*²³ An early study by Lal *et al.*¹⁶ found preponderance of O blood group in 73 patients of psoriasis as compared to preponderance of B group in controls.

In vitiligo patients in our study, B blood group was the most common, found in 47.4% patients, which was statistically significant, followed by blood group O found in 36.8% patients, but without statistical significance as compared to controls. Blood group A found in 10.5% patients was statistically significant as compared to controls.

Preponderance of B blood group was also found in a study by Srivastava *et al.*¹¹ on 535 vitiligo patients. Valikhani *et al.*²⁴ in their study also found that blood group B showed the most difference, although not significant.

Similar to the results in our study, Sehgal *et al.*¹⁵ also found a higher incidence of vitiligo in people with blood groups A and B and a lower susceptibility in individuals with blood group O on 173 patients of vitiligo.

Kareemullah *et al.*²⁵ in their study on 1000 vitiligo patients also found that the relative risk of O was significantly reduced in patients in

comparison with blood donors but not with local population, possibly because of preference of O group donors in the blood bank. So the reduced risk of the O blood group may not be real, and much larger samples or family studies, may be necessary to arrive at a conclusion.

A greater incidence of AB blood group was found by El Hefnawi *et al.*²⁶ in 80 vitiligo patients as compared to controls, and by Singh *et al.*¹³ in a study of 100 vitiligo patients.

No significant difference was found in a study by Kapur *et al.*¹ in 110 patients of vitiligo.

45.2% of patients with alopecia areata had blood group B, and this was not statistically significant when compared with controls. We did not come across with any previous Indian study in the literature regarding the ABO blood group association with alopecia areata.

40% each of patients of pemphigus in our study had blood group O and B, which was however not statistically significantly different from the control group.

In a study by Valikhani *et al.*,²⁷ O blood group was found most commonly in 573 patients of pemphigus, but without any statistical significance in comparison to the controls. This may exclude a probable relationship between blood grouping and pemphigus in our patients also.

Conclusion

In psoriasis patients in our study, blood group O was the most common, but without any statistical significance than the controls. In vitiligo patients, B blood group was the most common and this was statistically significant. Difference in the blood group A, although found

less frequently than B and O blood group, was also statistically significant between study group and controls. In alopecia areata, B blood group was the most common, but this finding was not statistically significant when compared to controls. In pemphigus patients, blood group O and B were equally common, but this was not statistically significant than the controls.

We conclude with the suggestion that further large scale studies be conducted in order to evaluate any association between blood groups and various dermatoses, as this subject has not been touched for quite a long time.

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