



A STUDY OF PREVALENCE OF BLOOD GROUP TYPES IN CHRONIC SKIN DISORDERS

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ABSTRACT

A hospital based observational case control study was conducted to evaluate the association of various chronic skin diseases with ABO blood group types on 1500 patients during one year time period. 468 patients of dermatophytosis, 338 patients of acne, 190 patients of psoriasis, 126 patients of chronic urticaria, 118 patients of androgenetic alopecia, 98 patients of alopecia areata, 98 patients of atopic dermatitis and 64 patients of vitiligo were included in the study. Control group comprised ABO blood group data of 10837 healthy donors collected from the database of blood bank. The data were compiled and subjected to statistical analysis using software SPSS, using chi-square test (χ^2) and taking p-value of <0.05 as significant. Blood group A was found to be statistically significant as compared to controls with chronic dermatoses like acne, chronic urticaria and psoriasis; blood group B was found to be statistically significant with androgenetic alopecia, atopic dermatitis, dermatophytosis and vitiligo; blood group O was found to be statistically significant with androgenetic alopecia, chronic urticaria and dermatophytosis. No association was found between the alopecia areata and ABO blood groups as compared to controls.

KEYWORDS: Blood groups, dermatophytoses, acne, alopecia, urticaria, psoriasis.

INTRODUCTION

ABO blood group antigens are regarded as RBC antigens which are actually expressed on a wide variety of human tissues and are present on most of the epithelial and endothelial cells. The ABO blood group antigens appear to have been important because the frequencies of different ABO blood types vary among different populations, suggesting that a particular blood group type conferred a selective advantage.^[1] During the past eight decades, a large number of studies have examined the possible relationship between blood group type and diseases e.g. in many cancers. Numerous associations have been made between particular ABO phenotypes and increased susceptibility to disease. For example, the ABO phenotype has been linked with stomach ulcers (more common in group O individuals) and gastric cancer (more common in group A individuals). Some publications evaluated the relationship between blood groups and skin diseases such as vitiligo, pemphigus vulgaris, discoid lupus erythematosus, oral lichen planus and skin tumors.^[2-13] However, only a few studies have examined the possible relationship between blood group types and chronic skin diseases so we felt that it might be

useful to see whether any such association could be found.

MATERIALS AND METHODS

A hospital based observational case control study was conducted at Department of Dermatology, Mahatma Gandhi Medical College & Hospital, Jaipur (Rajasthan). A study of 1 year duration was conducted from December 2015 to December 2016 on 1500 cases of chronic skin dermatoses presented in the out patient department. Diagnosis of skin dermatoses was made on the basis of history, dermatologic examination and clinical criteria. Demographic data of all the subjects were collected. Control group comprised of ABO blood group data of 10837 healthy donors collected from the database of blood bank of the same hospital.

Written informed consent was taken from all the subjects. Blood grouping was performed by slide agglutination method by putting corresponding antisera. Statistical analysis- The data were compiled and subjected to statistical analysis using software SPSS,

using chi-square test (χ^2) and taking p-value of <0.05 as significant.

RESULTS AND DISCUSSION

This study comprised of 8 chronic dermatoses in which number of patients enrolled was as follows- 468 patients of dermatophytosis, 338 patients of acne, 190 patients of psoriasis, 126 patients of chronic urticaria, 118 patients of androgenetic alopecia, 98 patients of alopecia areata, 98 patients of atopic dermatitis and 64 patients of vitiligo as shown in Table 1.

Out of these, 1060 (76.67%) were males and 440 (29.33%) patients were females.

Age wise distribution of the study group yielded a maximum number of patients in the age group of 20-29 yrs (668, 44.53%) followed by 10-19 yrs (306, 20.4%) age group with the least number in 0-9 yrs age group (12, 0.8%).

Majority (701, 46.7%) of the patients belonged to graduate group, followed by senior secondary group (275, 18.3%). The least number of patients were in illiterate group (104, 6.9%).

The largest group of patients were students (588, 39.2%), followed by semiskilled (244, 16.27%), unemployed (242, 16.13%), service (152, 10.13%), business (104, 6.93%), skilled (98, 6.54%) patients and farmers (72, 4.8%).

Majority of the patients in the study were Hindu (1372, 91.47%) followed by Muslim patients (112, 7.47 %) and patients from other religion (16, 1.06%).

Urban patients (1082, 72.1%) enrolled outnumbered rural patients (418, 27.9%).

Table 1: Blood Group Wise Distribution of Patients of Various Chronic Dermatoses Under Study.

| Sr. No. | Disease | Blood Groups | | | | Grand Total |
|---------|-----------------------|--------------|------------|------------|------------|-------------|
| | | A | AB | B | O | |
| 1 | Dermatophytosis | 108 | 24 | 222 | 114 | 468 |
| 2 | Acne | 110 | 36 | 102 | 90 | 338 |
| 3 | Psoriasis | 72 | 12 | 64 | 42 | 190 |
| 4 | Chronic Urticaria | 14 | 10 | 52 | 50 | 126 |
| 5 | Androgenetic Alopecia | 24 | 6 | 24 | 64 | 118 |
| 6 | Alopecia Areata | 20 | 10 | 32 | 36 | 98 |
| 7 | Atopic Dermatitis | 20 | 6 | 58 | 14 | 98 |
| 8 | Vitiligo | 10 | 4 | 34 | 16 | 64 |
| | Grand Total | 352 | 102 | 556 | 402 | 1500 |

Following inferences were drawn regarding specific dermatoses:

1. Dermatophytosis

In our study, most of the patients were males 376 (80.34%) probably due to damp and unhygienic working conditions, wearing tight fitting clothes and due to poor washing of private parts. Maximum number of patients was in the age group of 20-29 years (214) in our study. Most of the patients were students 152 (32.47 %).

The urban patients 317 (67.73 %) outnumbered rural patients in our study. It is nowadays rising in urban population also due to mixing of clothes during washing and because of wearing tight fitting clothes.

B blood group 222 (47.43 %) was the most common, which was statistically significant (p-value 0.0000) followed by blood group O 114 (24.35 %) which was also statistically significant (p-value 0.0018) in our study. Neering *et al*^[14] in 1973 couldn't demonstrate any relationship between blood groups and dermatophyte infection. Gamborg-Nielsen^[15] in 1994 verified higher frequency of *T. mentagrophytes* in patients from blood group A. Balajee *et al*^[16] in 1996 conducted a study in 108 culture proven dermatophytosis patients to observe relationship between dermatophytosis and ABO blood

groups. O blood group was found to be most common in 54 (50%) patients followed by blood group A in 49 (45.37%) which was not similar to our result. Fatima Regina Vilani-Moreno *et al*^[17] in 1999 conducted a study to found out the association between dermatophytosis and ABO blood groups. 47.5% of the patients belonged to group A followed by 40% in group O. Blood group B was found to be less common which was contradictory to present study. No consensus could be formed among various studies done on the subject, this is probably because of regional variations and distribution of various dermatophytosis and their predispositions.

2. Acne

In our study, most of the patients were males 228 (67.45%) may be ascertained to the cultural practice of applying copious amount of oil over scalp and face. In a study conducted by Nassaji.M *et al*^[18], 35 (28.2%) patients were men and 89 (71.8%) were women. In a study conducted by Terzi, Tursen *et al*^[19] in 498 patients in 2015 in Turkey, 341 (68.5%) were women and 157 (31.5%) were men.

Maximum number of patients were in the age group of 20-29 years (178) in our study as it is the common age of presentation due to factors like stress, hormonal change.

In a study conducted by Nassaji.M et al^[18], maximum number of patients 75 (60.5 %) were in the age group of 20-29 years. The mean age was 22.3±4.8 for patients. In a study conducted by Terzi, Tursen et al^[19], the mean age of the patients' group was 21.79 ± 6.21.

In this study, Most of the patients were students 246 (72.78 %) out of which 184 (54.43 %) were in college. This can be assigned to the fact that the hospital in which the study was conducted is located in an institutional area.

The urban patients 308 (91.12 %) outnumbered rural patients in our study may be due to likelihood of urban population being more concerned about their appearance.

Blood group A was most common with 110 (32.54 %), which was statistically significant (p-value 0.0007) followed by blood group B 102 (30.17 %) which was not statistically significant. In a study conducted by Nassaji.M et al^[18], the most common blood group among the patients was A (38.7%) followed by blood group O (27.4%) which was consistent with our study. In a study conducted by Terzi, Tursen et al^[19], blood group A (38%) was most common followed by blood group O (32%) and the ratio of blood group O of the patient group was significantly lower than in the control group ($P < 0.01$). As both the studies and our study were found in agreement, this needs further evaluation to study the severity and prognosis of the acne in relation to ABO blood groups especially blood group A.

3. Psoriasis

In present study, most of the patients were males 126 (66.31%). In a study conducted by Sardari et al^[20], most of the patients were males 57 (78.08%). In a case control study conducted by Parvaiz A Rather, Iffat Hassan et al^[21], most of the patients were males 98 (70%).

Maximum number of patients 48 (25.26%) were in the age group of 40-49 years in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan et al^[21], maximum number of patients 76 (54.3%) were in 21-40 years age group.

Most of the patients were semiskilled workers 54 (28.42 %) in our study. Most of the patients were less educated in our study.

The urban patients were equal to rural patients 95 each (50%) in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan et al^[21], 98 (70%) belonged to rural background.

Blood group A was most common with 72 (37.89%), which was statistically significant (p-value 0.0000) followed by blood group B 64 (33.68%) which was not statistically significant in our study. Belma Tursen et al^[22] conducted a retrospective study in 129 patients of psoriasis in which blood group A 55 (42.6%) was found

to be most common which was consistent with our study followed by blood group O 47 (36.4%).

Hargreaves et al^[23] in 1958 conducted a study on 200 patients of psoriasis in which blood group O was found to be most common 98 (49%) followed by blood group A 81 (40.5%) which didn't correspond with our study. In a study conducted by Sardari et al^[20], most common was blood group O 29 (39.7%) followed by blood group B 22 (30.1%). Blood group A was found to be less common which was not consistent with our study. MacSween and Syme^[24] in 1965 and Wendt^[25] in 1966 conducted their studies and could not demonstrate any relationship between psoriasis and ABO blood groups. Awachat and Sharma^[26] in 1963 concluded predominance of blood group B (44.6%) followed by blood group O (29.7%) in psoriasis patients. Gupta and Gupta^[27] in 1963 reported significant predominance of blood group O. In a study conducted by Mohammad Shahidi Dadras et al^[28] on 50 patients of psoriasis, blood group O was found to be most common in 21 (42%) followed by blood group A 15 (30%) which was not alike our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan et al^[21], blood group O 52 (37.1%) was found to be most prevalent followed by blood group B 42 (30%) which was not consistent with our study.

4. Chronic Urticaria

In present study, most of the patients were males 74 (58.73%). In a study conducted by Abdulsalam Tanriverdi, Ümit Tursen et al^[29], most of patients were females 56 (56%).

Maximum number of patients 54 (42.85%) were in the age group of 20-29 years in our study. The urban patients 94 (74.6 %) outnumbered rural patients in our study.

B blood group 52 (41.26%) was most common, which was not statistically significant followed by blood group O 50 (39.68%) which was statistically significant (p-value 0.0402) in our study. Blood group A was found to be less common as compared to other blood groups while it was found to be statistically significant (p-value 0.0005) as compared to controls. In a study conducted by Abdulsalam Tanriverdi, Ümit Tursen et al^[29], most common blood group detected was blood group O, found in 35 patients (35%) followed by blood group A in 32 (32%) patients but they didn't report any blood group to be significantly associated with urticaria. This was not consistent with our study but needs further investigation.

5. Androgenetic Alopecia

In our study, most of the patients were males 108 (91.52%) as it is more common in males.

Maximum number of patients 90, was in the age group of 20-29 years as it is the common age of presentation and people are more concerned about their looks in marriageable age.

Most of the patients were students 52 (44.89 %). Most of the patients were highly educated. The urban patients 102 (86.44 %) outnumbered rural patients as urban people are more attentive towards their appearance.

O blood group 64 (54.23%) was most common, which was statistically significant (p-value 0.0000) followed by blood group A and B both including 24 subjects (20.33 %), but only the association with blood group B was found to be statistically significant (p-value 0.0008). No comparable study regarding this topic was found which shows a need for further investigation.

6. Alopecia Areata

In our study, most of the patients were males 72 (73.46%). In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], most of the patients were males 56 (57.14%).

Maximum number of patients 34 was in the age group of 20-29 years in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], maximum number of patients 64 were in the age group of 21-40 years.

The urban patients 72 (73.46 %) outnumbered rural patients in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], the rural patients 52 (53.06 %) outnumbered urban patients.

O blood group 36 (36.73%) was most common followed by blood group B 32 (32.65 %) but no blood group was found to be statistically significant in comparison to controls in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], blood group B was found in 38 (45.3%) followed by blood group O in 24 (28.6%) patients. No association with any blood group was found to be significant, which was consistent with our study.

7. Atopic Dermatitis

In our study, most of the patients were females 54 (55.10%). In a study conducted by Dwijendra Nath Gangopadhyay, Biswanath Naskar *et al*^[30], most of the patients were males 18 (60%) which was not consistent with our study.

Maximum number of patients 28 was in the age group of 20-29 years followed by 20 patients in 50-59 years in our study. In a study conducted by Dwijendra Nath Gangopadhyay, Biswanath Naskar *et al*^[30], the highest number (7) of patients were in the age group of 11-20 years followed by 6 patients each in 3-10 and 21-30 years age group which was not consistent with our study. The difference in the common presenting age group in our study is largely due to lack of consent given by parents to determine the blood group of the younger patient. According to our exclusion criteria, we did not include patients who did not give informed consent.

Most of the patients were unemployed 38 (38.77 %) and maximum number of patients was in group having primary education in our study which shows patient educational status was low. In a study conducted by Dwijendra Nath Gangopadhyay, Biswanath Naskar *et al*^[30], most of the patient's educational status were low.

The urban patients 51 (52.04%) were more than rural patients with only mild difference present. In a study conducted by Dwijendra Nath Gangopadhyay, Biswanath Naskar *et al*^[30], most of the patients belonged to rural areas.

B blood group 58 (59.18%) was most common, which was statistically significant (p-value 0.0000) followed by blood group A 20 (20.4 %) which was not statistically significant in our study. Blood group O was also found to be statistically significant (p-value 0.0003) in our study. In a study conducted by Dwijendra Nath Gangopadhyay, Biswanath Naskar *et al*^[30], B blood group 14 (46.7%) was most common followed by blood group A with 10 (33.3 %) which corresponds to our study.

66 patients (67.34%) have personal history of atopy and 71 patients (72.44 %) have family history in our study. In a study conducted by Dwijendra Nath Gangopadhyay, Biswanath Naskar *et al*^[30], 19 patients (63.3%) have personal history of atopy and 21 patients (70 %) have family history of which was similar to our study.

8. Vitiligo

In present study, males and females subjects were in equal number 32 each (50%). In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], 42 (55.3%) were males.

Maximum number of patients 32 (50%) were in the age group of 20-29 years in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], most number of patients 44 (57.9%) were in age group of 21-40 years.

Most of the subjects were students 22 (34.37 %). Most of the patients were poorly educated in our study.

The urban patients 43 (67.18 %) outnumbered rural patients in our study. In a case control study conducted by Parvaiz A Rather, Iffat Hassan *et al*^[21], more patients 44 (57.9%) were from rural backgrounds.

B blood group 34 (53.12%) was most common, which was statistically significant (p-value 0.0028) followed by blood group O 16 (25%) which was not statistically significant in our study. In a study performed in 80 cases of vitiligo. In a case control study carried out in 2014 in Srinagar by Parvaiz A Rather, Iffat Hassan *et al*^[21] in 76 patients of vitiligo, B blood group was the most common in 36 (47.4%) patients, blood group O was found in 28 (36.8%) patients which was consistent with our study and blood group A was found to be less common. These

results are exactly in congruence with the findings of this study. Srivastava and Shukla^[31], in 1965, studied 535 vitiligo patients which reported a higher incidence of blood group B which was consistent with our study. In a study conducted by V.N.Sehgal *et al*^[32] in 1968 on 173 patients with vitiligo, blood groups B and A were found to be statistically significantly associated with vitiligo. Blood group B was found to be most common but not significant in a study conducted by Valikhani *et al*^[33] which was in agreement but not consistent with our study.

On the other hand, El-Hefnawi *et al*^[34] in 1963 found a greater incidence of AB groups than in their controls. Singh and Shanker^[35], in a similar study on 100 cases, found a statistically significant association of vitiligo and AB blood group. Kareemullah *et al*^[36] in their study on 1000 vitiligo patients in 1977 also found that the relative risk of O was significantly reduced in patients in comparison with blood donors but not with local population. Wasfi, Saha, *et al*^[4] conducted a study in 1980 and no significant association with ABO blood groups was observed in vitiligo. In a study conducted by Olasode OA *et al*^[2] in 2002 on 60 patients, no direct relationship between their vitiligo and ABO blood groupings was established.

CONCLUSION

1. In dermatophytosis, blood group B and O was found to be statistically significant as compared to controls.
2. This study reported a significant association between acne and blood group A as compared to controls.
3. Blood group A was found to be statistically significant as compared to controls in psoriasis although multiple and extensive research had been done on the subject.
4. Blood groups A and O were found to be statistically significant as compared to controls in chronic urticaria.
5. Association with B and O blood groups was found to be statistically significant as compared to controls in androgenetic alopecia.
6. In atopic dermatitis, blood group B was found to be statistically significant as compared to controls.
7. Blood group B was found to be statistically significant as compared to controls in vitiligo.
8. No association was found between the alopecia areata and ABO blood groups as compared to controls.

As a limitation of the cross sectional nature of this study, we couldn't co-relate the prognosis of various dermatoses (under consideration) with ABO blood groups.

To conclude ABO blood groups plays a key role in chronic dermatoses such as acne, androgenetic alopecia, alopecia areata, atopic dermatitis, chronic urticaria, dermatophytosis, psoriasis and vitiligo, and this needs

further evaluation and research for their role as prognostic factors of these dermatoses.

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