

ASSOCIATION OF ABO AND RH BLOOD GROUP WITH TYPE II DIABETES MELLITUS

Maria Abdullah,¹ Sana Haseeb Khan,² Ayesha Bajwa,¹ Kashaf Mustafa¹

Abstract

Background and Objective: Much of the research has shown the link of various blood groups with different ailments. It has also been assumed that those blood groups are genetic determinants of different diseases, like diabetes. The objective of this study was to find an association between blood group and Type II diabetes (T2DM).

Design: We conducted a cross-sectional study in which diagnosed diabetic patients having blood sugar fasting (BSF) greater than 125mg/dl were enrolled. We determined their blood groups by the tube method.

Place and duration: The study was conducted at blood bank and medical wards (indoor and outdoor) of Gulab Devi hospital Lahore for a period of six months i-e June 2021 to December 2021.

Methods: A structured questionnaire was used to collect socio-demographic and clinical data from the patients. Their blood samples were drawn and the blood grouping was determined by tube method by the researcher herself. The data was evaluated using IBM SPSS21 statistical software.

Results and conclusion: The current study found no link between T2DM and ABO blood groups but shows the highest occurrence of blood group B and the least prevalence of AB-blood group in the study population.

Key words: Type II diabetes, ABO blood group, Pakistan

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Among the 33 blood group systems, ABO is the most significant one.¹ ABO genes are present on chromosome 9 and transfer glycoproteins on type II precursor chains of red blood cells (RBCs).² If it transfers N-acetyl galactosamine, it will become an A antigen. If it transfers D-galactose, we will get B anti-gens. If both N-acetyl galactosamine and D-galactose are transferred, the type II precursor chain will become an AB antigen, and if no sugar is transferred, the antigen will be given the name O blood group. Similarly, a person having blood group positive or negative depends upon the presence or absence of D antigen.³ The blood group will be Rh

positive in the presence of D antigen and negative in the absence of D antigen.

Diabetes mellitus is a metabolic infirmity, which has been categorized by hyperglycemia⁴ caused by a variety of factors such as a defect in insulin secretion or action, resulting in a defect in carbohydrate, fat, and protein metabolism.⁵

Blood groups are considered to be inherent factors of different diseases.⁶ Since the ascertainment of blood groups in 1900, medical science has always tried to detect a link between Rh and ABO blood groups and diverse maladies.⁷ The pathophysiology behind this link between blood group and diabetes is the locus that attracts inflammatory mediators that resist the action of insulin.⁸

Several studies have been undertaken to indicate a link between Rh and ABO blood types and type II Diabetes, but the results have been inconsistent. Therefore, the goal of this study is to analyze the link of Rh and ABO blood groups with type II diabetes mellitus.

1,3-4. Gulab Devi Educational Complex, Lahore

2. Assistant Professor Pathology Gulab Devi Hospital Lahore

Correspondence:

Maria Abdullah, Gulab Devi Educational Complex, Lahore
Email: abdullahmaria38@gmail.com

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Individuals with questionable blood types should take preventive action to avoid predisposing factors that can lead to diabetes.

METHODS

This cross-sectional research was conducted for the duration of six months from (August 2021-January 2022) at the Blood Bank of Gulab Devi Teaching Hos-pital. A non-probability consecutive sampling tech-nique was used. Samples from known patients of type II diabetes mellitus (according to WHO criteria) of both genders, aged 18 to 60 years, were included in the study. We took samples from both indoor and out-door patients from medical wards. Patients with malig-nancies and pregnant women were excluded.

RESULTS

Out of 200 diabetic patients, 41.5% were men and 58.5% were women, with mean age of 46.9 years and S.D of 12.6 and BSF (> 125 mg/dl) with a mean BSF of 181.05 mg/dl and S.D of 32.83. 97.5% of the population had polydipsia, while the rest of the study population had symptoms such as weight loss in 74% of the patients, polyuria in 93% of the patients, and a family history of diabetes was present in 70.5%.

The frequency dissemination of ABO and Rh blood groups is mentioned in Table 1. The B+ blood group was the most common in our study population, while the AB-and O-blood groups were least common. The Chi square test has been applied to investigate the association between diabetes and blood grouping.

Table 1: Distribution of ABO blood groups among study population

Blood group	Frequency (n)	Percentage (%)
A+	38	19
A-	9	4.5
B+	105	52.5
B-	4	2
O+	11	5.5
O-	2	1
AB+	29	14.5
AB-	2	1
Total	200	100

P value: 0.70

The value of p is 0.70 (greater than α) which shows association between Rh and ABO blood group phenotype with T2DM.

DISCUSSION

Studies in Saudi Arabia, India, Qatar, and Malaysia have revealed homogeneous consequences. Research in Iran has exhibited a reduced hazard of the O blood group developing DM, however, the connotation was not demographically important.⁴ The motive for this defensive influence of the O blood group might be the meager level of intemperate interceders like factor VII and Von Willebrand factor (VIII-VWF) complex, inter-cellular union molecule-1 (ICAM-1), and Tumor necrosis factor (TNF). At odds to the present research result, a research in India testified that blood group O had elevated hazard of evolving Diabetes as associated with other blood groups. The motives for the pragmatic diversions in results might be the environmental and inherent alterations in which this research was triggered and performed.

As the B blood group was marginally more common in Diabetes patients in this study, no statistically significant association between T2DM and the B blood group was found. It's worth noting that diabetics had a developed ratio of blood groups B in our study, but this did not achieve statistical significance; ABO blood group distribution was insignificant in victims, and the exact was fact for gender, i.e., least numerical inference.

Results from research from Italy and Trinidad suggest that diabetics have an advanced frequency of blood type B. In contrast research in Germany and Glasgow speculates that there was no notable link between diabetes and ABO blood groups.¹⁰ Researches demonstrate that certain populations have a beneficial relationship between Diabetes and ABO blood groups, but the data is mixed. In the current study, there was no relationship between blood groups and DM type 2 (p value 0.70; $p >$), with both blood groups (B and AB) being less common in the study population (diabetic patients). However, to corroborate our judgments, studies on a large sample size in various racial groups

would be required.

CONCLUSION

We concluded from our results that there is no link between diabetes and blood groups but this may be due to one side study, short study duration, and small sample size. To corroborate our judgments, study on large number of sample size in various racial groups would be required.

Conflict of Interest

None

Funding Source

None

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