

Original Research Article


# A comparative study of blood groups with relation to academic achievements among medical students in North India

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## Abstract

**Background:** The purpose of present study was to know the relation between the four blood groups (A, B, AB, and O) and high academic scores among students of Government medical colleges of North India.

**Materials and methods:** Study was conducted in Department of Physiology, Dr BSA Medical College, Delhi and UCMS, Delhi on 247 medical students both males and females of age group 18-20 years. Blood groups were collected from past medical records during the time of admission and Confirmation was done during the blood grouping practical classes. Blood group, completion test marks, internal assessment marks (theory, practical and viva-voce) in percentage were tabulated. Statistical analysis was done by SPSS 16.0 software.

**Results:** Out of 247 students 98 students were B group, 76 students were O group, 57 students were A group and 16 students were AB group. Total number of Blood group B students (N=22) who scored high marks were more than the other blood group students. While the %age of students of A blood group (29.8%) were more than other blood groups.

**Conclusion:** Though our study showed that there was a variation in the academic scores between the blood groups A, B, O and AB, there was no significant association ( $p < 0.05$ ) found between any blood group and academic scores. So, the conclusion of our study was that there was no real correlation between blood groups and academic scoring.

## Key words

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Blood groups performance, Scores, Intelligence, Academic.

## Introduction

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The evolution of human blood groups, without doubt, has a history as old as man himself. Global distribution pattern of blood groups depends on various environmental factors, such as disease, climate, altitude, humidity etc. It was not until the year 1900, when Karl Landsteiner at the University of Vienna, discovered the ABO blood group system by mixing the red cells and serum of each of his staff.

Since Landsteiner's discovery in 1901 that human blood groups existed, a vast body of serological, genetic and recently biochemical data on red cell blood group antigens has been accumulated. More than 200 red cell antigens have been described, most of which have been assigned to well define blood group systems.

The ABO blood group antigens remain of prime importance in transfusion medicine- they are the most immunogenic of all the blood group antigens.

Almost all blood group genes are expressed as co-dominant antigens, i.e., both genes are expressed in the heterozygote. The gene that determines human ABO blood type is located on chromosome 9 (9q34.1) and is called ABO glycosyltransferase, Rh system on chromosome 1 [1, 2]. The antigens of the ABO blood group system (A, B and H determinants, respectively) are complex carbohydrate molecules on the extracellular surface of red blood cell membranes.

However, along with their expression on red blood cells, ABO antigens are also highly expressed on the surface of a variety of human cells and tissues, including the epithelium, sensory neurons, platelets, and the vascular endothelium [3, 6].

Thus, the clinical significance of the ABO blood group system extends beyond transfusion medicine and several reports have suggested an important involvement in the development of cardiovascular, oncological and other diseases [4, 5]. Human behavior to a great extent is outcome of blood chemistry meaning thereby different constituents of the blood and their proportion regulates human behavior. A slight change in the blood chemistry deviates normal behavior of the man. Similarly variation in blood chemistry varies persons in blood group [10].

The association between the ABO blood group system and personality has been narrated by many authors. Hippocrates and Galen were among the first to hypothesize a biological basis for personality [7, 8]. But there are very few studies correlating blood group and academic performance [9].

Considering above mentioned facts the present study was aimed to assess the academic performance and blood group in students of Government medical colleges of North India.

Intelligence refers to mental abilities that the individual owns and used them to solve problems and to get the cognitive, motion, and emotional skills. Man has many different abilities which include measurable and non measurable ones. These abilities could be an indicator to achieve practical and academic scores. Most of the studies are associated with blood group, personality or intelligence (Atoom) [8]. Very few studies are there showing association of blood group and academic performance [9].

Blood Group A persons are collaborator person intelligent, soft spoken, and calm. They are more susceptible to diabetes, anemia, and heart diseases and most affected by stress.

Blood Group B persons are characterized by flexibility and creativity. They are more prone for recurrent UTI. This blood group is more common in majority of the peoples of China, Japan, and Southeast Asia.

Blood Group AB: persons are called *spirituals* because they gently receive all kinds of life and without any negative perception. This blood group is more prone to malaria.

Blood Group O: persons are having in their lives physical and personal strength, stamina, self-reliance, courage, pursuit of success, leadership features, power, and optimism and they least respond to stress.

## Materials and methods

### Subjects and inclusion criteria

The present study was conducted for first year medical students of age group 18-20 years.

A total of 247 Medical professional students with both females and males were taken.

### Setting

The study was conducted at Department of Physiology, DR BSA Medical College and hospital Delhi from September 2016 to May 2017.

### Study design

Cross sectional study

### Blood Group assessment

- Blood groups were collected from past medical records during the time of admission
- Confirmation was done during the blood grouping practical classes. Blood samples were taken by finger pricks by the students and the open slide method of ABO blood groups testing was followed. RBCs suspended in isotonic saline were treated with anti-A, anti-B and anti-D antisera (J. Mitra & co, New Delhi) on glass slides and mixed with separate

applicator sticks. The mixture was observed for agglutination with corresponding antisera and compared with the control for confirmation. Uncertainty was clarified with focusing the slide under microscope.

- Direct method was also used in certain cases for clarification

### Assessment of Academic record

Blood group, completion test marks, internal assessment marks (theory, practical and viva-voce) in percentage were tabulated. The students who scored 60% and above were considered as high score.

### Statistical Analysis

Statistical analysis was done by SPSS 16.0 software for calculation of mean, standard deviation, percentage and Correlation bivariate for significant P values ( $P < 0.05$ ).

## Results

Out of 247 students 98 students were B group, 76 students were O group, 57 students were A group and 16 students were AB group. **Table - 1** shows that the mean age of participants was 18.94 years (19.0 years for males and 18.8 years for females).

**Table - 2** shows the actual number of students who scored high marks in various blood groups. Total number of Blood group B students ( $N=22$ ) who scored high marks were more than the other blood group students.

While **Table - 3** shows the percentage of students who scored high in different blood groups. Here the percentage of students of A blood group (29.8%) were more than other blood groups.

**Table – 1:** Average age of students.

	Total number	Average age (years)	SD
	247	18.94	0.68
Males	172	19.0	0.679
Females	75	18.8	0.677

**Table – 2:** Blood group and high academic score of students.

	A <sup>+</sup>	A <sup>-</sup>	B <sup>+</sup>	B <sup>-</sup>	O <sup>+</sup>	O <sup>-</sup>	AB <sup>+</sup>	AB <sup>-</sup>
Blood group	54	03	95	03	71	05	14	02
High Academic score(N)	17	0	21	01	19	0	01	0
	17		22		19		01	

**Table – 3:** Blood group and Percentage of students scored high.

Blood Group	% of students having high academic score
A	29.8
B	22
AB	06
O	25

## Discussion

In the study of Bu Dinar (2011) [11] about the differences in IQ among children aged (6-14 years), according to the difference in their blood types. This study tried to answer the questions as to whether there is significant differences between children in IQ and different types of their blood groups. According to this study children of blood groups AB have better IQ than other groups.

Another study shows a correlation between height and IQ, which means that those who are shorter than average are more likely to have IQ less than the longer persons.

Nature in 1973 published a paper of Gibson, et al. [7] on relationship between blood group and intelligence. There are various statistical reports showing the association of blood groups with various diseases. In the last 20 years there has been increasing evidence that blood groups have a function and play a biological role.

Human behavior to a great extent is outcome of blood composition meaning thereby different constituents of the blood and their proportion regulates human behavior. A slight change in the blood composition deviates normal behavior of the man. Similarly variation in blood composition variates persons in blood group.

This biological role often does not relate to the red cell, but to the presence of chemical moieties on other cells that were initially identified as a red cell antigen. Antigens first identified on RBCs, are now known to be important as receptors and ligands for bacteria, parasites and immunological proteins (for example those associated with blood groups and malignancy) [6, 7]. There is an established association between blood groups and cancers, peptic ulcer disorders, stress, coagulation disorders, cardiovascular diseases, Infections, and renal diseases [8].

## Conclusion

Though our study showed that there was a variation in the academic scores between the blood groups A, B,O and AB, there was no significant association ( $p < 0.05$ ) found between any blood group and academic scores. So, the conclusion of our study was that there was no real correlation between blood groups and academic scoring.

## Summary

We conclude that blood group A students have high academic scores than other blood groups i.e. B, AB or O.

## Further study

The limitation of our study was unequal number of blood group size (very few AB blood group participants).So further study should be done with bigger sample size. This study was done only in a specific group (medical students) of subjects. In future study can be done with other students like engineering, arts and science background.

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