

Correlation of academic scores with blood group among first MBBS medical students

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Abstract

Background: The theory that there is a possible correlation between blood types and personality characteristics, other diseases, neurological disorders have been floating for a long time.

Aim: The aim of our study was to explore a possible correlation between blood groups and scholastic performance in a large sample of medical students in south India.

Materials: The study was conducted at Sri Muthukumaran Medical College and Research Institute, Chikkarayapuram, Chennai, India during October 2011- October 2014

Participants: Our study included 450 first year MBBS Medical students of the age group 18 to 19 years.

Methods: Blood groups were collected and for assessment of scholastic performance we used +2 (twelfth standard) marks and overall internal assessment marks of the first MBBS students. Analysis of data was done using SPSS software (version 15).

Conclusion: Our study revealed a considerable difference in academic scores between the blood groups O and A. Conversely, when the analysis was done individually for male and female students, there was significant correlation between academic scores. This implies gender was probably a confounding factor responsible for the initial difference in academic scores. So, the conclusion of our study was that there was no definite correlation between blood groups and academic scores.

Keywords: academic scores, blood groups

1. Introduction

Since Landsteiner's discovery in 1901 that human blood groups existed, a vast body of serological, genetic and more recently biochemical data on red cell blood group antigens has been accumulated. About 200 red cell antigens have been described, most of which have been assigned to well define blood group systems. Apart from the ABO system, most of these antigens were detected by antibodies stimulated by transfusion or pregnancy.

Almost all blood group genes are expressed as co-dominant antigens, i.e., both genes are

expressed in the heterozygote. Some blood group genes have been assigned to specific chromosomes, e.g. ABO system on chromosome 9, 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].

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].

Current knowledge on the association between the ABO blood group system and personality, various diseases has been narrated by many authors. Hippocrates and Galen were among the first to hypothesize a biological basis for personality. But there are barely any studies correlating blood group and academic performance therefore we have taken up this study.

2. Materials and methods

2.1 Study Design

A cross-sectional study.

2.2 Participants

2.2.1 Inclusion criteria

First year Medical students with age between 18 and 19 years.

A total of 450 Medical professional students with 280 females and 170 males. Every year we are admitting 150 students from various places of south India like Tamilnadu, Andhra Pradesh and Kerala. 50% from govt. quota and 50% from management quota. 50% government students are from illiterate family and low socioeconomic status. We have included the students from English, Tamil and few Telugu and Malayalam medium belonging to both high and low socioeconomic statuses.

2.2 Setting

The study was conducted at Sri Muthukumaran Medical College Hospital and Research Institute, Chikkarayapuram, Chennai-69 from October 2011 to October 2014

2.3 Blood typing

Blood groups were collected from past medical records during admission and reconfirmed 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.

2.4 Academic score assessment

Blood group, twelfth standard marks, Monthly test marks, internal assessment marks (theory, practical and viva-voce) in percentage was tabulated. Since AB blood group is of least common blood group, to maintain the equality of subjects blood group we included all AB blood group students' marks (out of 450 students 27 were AB blood group) and randomly selected 27 students' marks from other blood groups.

3. Results

Out of 450 students 155 students were O group, 138 students were B group, 130 students were A group and 27 students were AB group.

Table 1 show that the mean age of participants was 19.25 yrs (18.07 yrs. for females and 19.09 yrs. for males).

Table 1: Mean age of participants

| | N | Min. age (years) | Max. age (years) | Mean age (years) | S.D. |
|--------|-----|------------------|------------------|------------------|-------|
| Total | 450 | 18 | 19 | 19.25 | 1.113 |
| Female | 280 | 18 | 19 | 18.07 | 1.065 |
| Male | 170 | 18 | 19 | 19.09 | 1.139 |

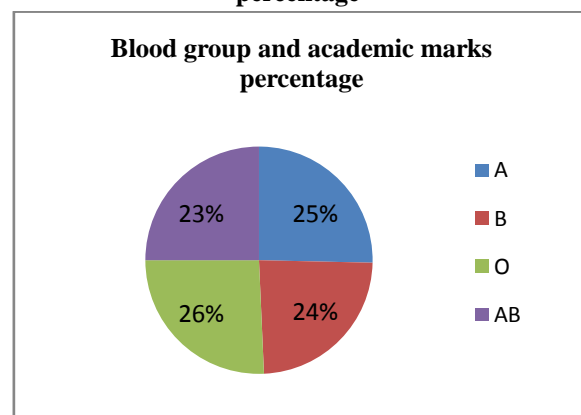
Table 2: shows the overall association between blood groups and academic scores

| Blood group | A | B | O | AB |
|--|----|----|----|----|
| Percentage of students scored high marks | 25 | 24 | 26 | 23 |

The above tabular column states O blood group students have scored high marks than the other blood group students.

Fig: 1 showing the percentage of students who have scored high marks in twelfth standard and first MBBS internal assessment exams

Figure 1: Blood group and academic marks percentage



4. Discussion

In 1973 the highly respected scientific journal "NATURE" published a paper by Gibson *et al* on a relationship between ABO groups and intelligence.[5] We have come a long way since the early reports of statistical association of ABO Blood Groups and various Diseases and the ensuing vitriolic debates. In the last 20 years there has been increasing evidence that blood groups have a function and play a biological role. 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 important proteins (e.g. those associated with movement of normal and malignant cells throughout the body)[6][7]. There is an established association between blood groups and cancers, peptic ulcer, coagulation disorders, Bleeding Disorders, Clotting Disorders, Infections, and renal diseases.[8]

The fortunate thing of our study is inclusion of a well defined aim, a large sample size, a homogenous sample population, a scientific method of determining blood groups. Though our study showed that there was a difference in the academic scores between the blood groups O and A, there was no significant association 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.

5. Conclusion

On the basics of observation we concluded that the O group blood student's academic scores are better than other blood group students.

6. Future scope of the study

This research work was done only in medical college students, further on plans to do the study in various other colleges (like IIT, Engineering, Arts & science, Govt. & Private schools) and also in rural areas. We will also try to hit upon in future, why the O group blood students are scoring good marks than others. Gender variation in higher secondary and College (first year to final year) academic scoring.

7. Limitation of the study

The limitation to the study is Unequal count among the different blood groups, with a low number of participants with blood type AB.

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