

# Frequency of ABO Blood Groups among medical students of the Lahore Medical and Dental College

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## ABSTRACT

**Aim:** To find out the frequency of ABO blood groups among medical students in Lahore Medical and Dental College. This study was conducted in the department of Pathology at LMDC.

**Aim:** To determine the frequency and distribution of "A, B, AB, O and Rh" blood groups among medical students and aware them to importance of blood groups and blood bank.

**Methodology:** It is Cross sectional study conducted at the department of Pathology, Lahore Medical and Dental College, Lahore from March 2019 – May 2019. Medical students of all five years of MBBS were enrolled in the study. ABO and Rh blood groups were determined by antigen antibody agglutination slide test method.

**Results:** According to our study, out of 785 students, 335 were males and 450 were females. The frequency of blood group B (36.1%) was found to be highest followed by blood group O (9.5%), A (24.9%) and AB (29.5%). The results also indicated that 89.6 % were Rh positive and 10.6% were Rh negative. Rh group (antigen) was positive in 42% males and 57% females. In this study we concluded that group 'B' is the commonest blood groups among both male (46.8%) and female (53.1%) medical students.

**Conclusion:** The pattern of ABO and Rhesus blood group distribution will help us to arrange donors in times of emergency keeping in view the hazardous situations where blood transfusions can be life saving.

**Keywords:** ABO Blood group, Gender, Rh, Antigen, Medical students.

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## INTRODUCTION

Altogether 36 human blood group systems and 346 antigens are recognized by the International society of blood transfusion. ABO and Rh blood group system are considered most significant<sup>1</sup>. There is a great variation of blood groups amongst the different parts of the world. In few areas of Africa and predominantly in central Asia, type B allele has the highest frequency as compared to America and Australia, where it is lowest. Blood group O and B are of equal dominance in Indo-Pak subcontinent<sup>2</sup>. Studies conducted at different setups including Rawalpindi medical college and Public Medical School Lahore showed prevalence of the B+ blood group and the least prevalent was AB blood group. Similarly a study at Akhtar Saeed Medical College showed that blood group B was the most common blood group in the students whereas most frequent blood group O was reported in a study carried out at the Liaquat National Medical College. The blood group distribution pattern among limited adult human population of district Gilgit, Gilgit-Baltistan has showed high prevalence of the A+ blood group while blood groups; B-ve and AB-were less prevalent. It is of prime importance to know the blood groups of population so that we can arrange blood in times of natural calamities or war situation. This would help us minimize the consequences as a result of such hazardous circumstances. Antigens present on the

surface of red blood cells serve as a basis for the determination of the blood group. These antigens consist of glycoproteins and glycolipids and thus are capable of initiating an immune response which results in the production of specific antibodies<sup>3</sup>. A, B and O antigens are also expressed on the surface of epithelial cells of GIT, urogenital, bronchopulmonary tract and endothelial cells and therefore are culprits in initiation of various infections and malignancies<sup>4</sup>. Blood group plays a vital role in the field of transfusion medicine, organ transplantation, and blood banking services. They are useful in genetic studies of population and also resolving medico legal issues, particularly of disputed paternity cases<sup>5</sup>. Recent studies have shown that ABO blood group affects the levels of von Willebrand factor (VWF) and factor VIII thus contributing to cardiovascular abnormalities<sup>6</sup>. Blood group plays an important role in the generation of various chemical mediators and producing a systemic inflammatory response<sup>7</sup>. There is evidence that ABO antigens also mediate microbial infections such as H.pylori and Norwalk virus [8]. Rh antigens of medical interest are D, C, E, c and e<sup>9</sup>. Rhesus antigen determination is important in areas of antenatal serology, paternity testing and selecting compatible blood<sup>10</sup>.

## METHODOLOGY

**Subject:** The study was conducted in the department of Pathology, Lahore Medical and Dental College, Lahore. Blood sample from 785 students were taken with informed consent.

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**Material:** Blood from each student was withdrawn by using finger prick method. For this purpose, lancets, cotton and 70 % ethyl alcohol swabs were used. For blood samples, clean glass slides were used. Anti-sera A and Anti-sera B were used as agglutinating agents.

**Procedure:** Each student was clearly informed about the procedure to be performed and was made sure that there information will be kept confidential. To keep aseptic measures, an alcohol swab (70% ethyl alcohol) was used to clean the area to be pricked. A fresh lancet was used to prick the cleaned finger. One or two drops of blood were put on a clean glass slide. Each sample was mixed with Anti-sera A and Anti-sera B to find the particular blood group by agglutination of RBCs with respective anti-sera. After withdrawal of blood, a clean piece of cotton was used to stop bleeding from pricked site. Each student was thanked at end of procedure.

**RESULT**

Results for our research are shown in table 1, table 2 and table 3. According to our research, majority of students

(both male and female) had B+ blood group followed by O+ and A+.

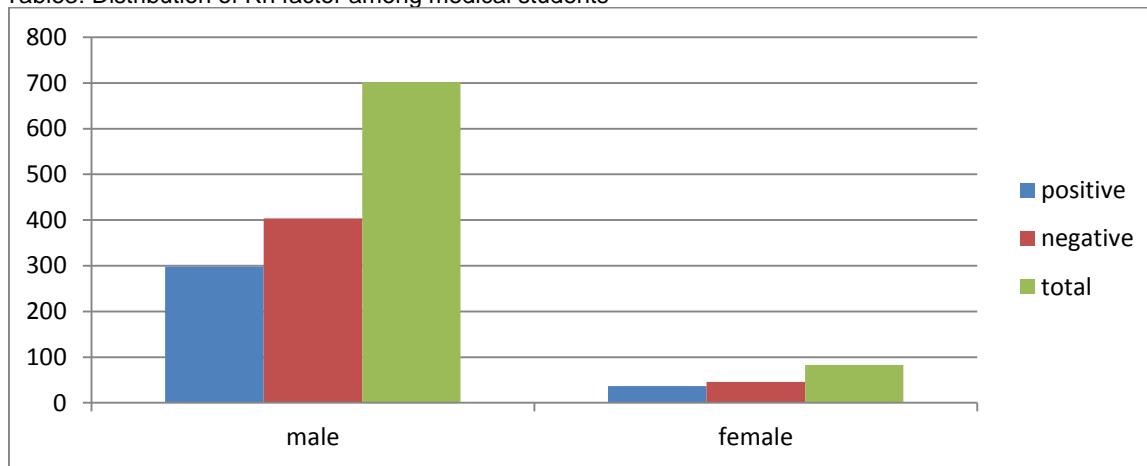
Table 1: Frequency of different blood groups among medical students

Blood group	Total n(785)	Male n(335)	Female n(450)
A	194(24.9%)	71(36.5%)	123(63.5%)
B	284(36.2%)	133(46.8%)	151(53.1%)
O	75(9.5%)	30(40%)	45(60%)
AB	232(29.5%)	101(43.5%)	131(56.5%)

Table 2: Distribution of Rh factor among medical students

Blood group	Total n(785)	Male n(335)	Female n(450)
A+	171(21.7%)	64(37.4%)	107(62.5%)
A-	23(2.9%)	7(30.4%)	16(60.6%)
B+	261(33.2%)	122(46.7%)	139(53.2%)
B-	23(2.9%)	11(47.8%)	12(52.2%)
O+	69(8.7%)	28(40.5%)	41(60.5%)
O-	6(0.7%)	2(33.3%)	4(66.6%)
AB+	201(25.6%)	84(41.7%)	117(58.2%)
AB-	31(3.9%)	17(54.8%)	14(45.2%)

Table3: Distribution of Rh factor among medical students



**DISCUSSION**

The knowledge of frequency of ABO blood groups provides an opportunity for the direct recruitment of voluntary donors as required or each zone across the country. Thus, it is important for the students as well as the college administration to keep a record of blood groups so as to be a source of donation to people in hours of emergency and to make themselves better aware of the various types of diseases which are associated with their blood groups. Similarly blood groups and Rhesus factors are important in evolution, relating to the environment, organ transplantation, forensic pathology, anthropology and tracing ancestral relation of humans<sup>11</sup> and preventing complications due to Rhesus incompatibility<sup>12</sup>. A study conducted at Nishtar medical college in 2009 showed that blood group B was predominant among the students in order of B>O>A>AB, exactly in correspondence with our study conducted at Lahore Medical and Dental College. Comparative study on data among the different studies in Indo-Pak subcontinent revealed that there was an equal

dominance of group B and O<sup>13</sup>. Similarly, studies done in Pakistan have shown that blood group B predominated in many regions of Punjab and Multan, Swat, Gilgit and Rawalpindi/Islamabad, while in Sindh and Balochistan, group O was predominant<sup>14</sup>. Data from the neighbouring country Nepal, revealed higher frequency of blood group A amongst the students<sup>15</sup>. Whereas a study conducted at the Benue State University Makurdi, Nigeria showed the predominance of blood group O followed by blood groups B,A,AB<sup>16</sup>. In Australia<sup>17</sup>, Britain [18] and USA<sup>19</sup>, group O and A were the commonest followed by B and AB. In African subcontinent phenotypic frequency order is as follows; O>A>B>AB. There is known genetic association of specific blood groups to certain diseases. Several studies have shown that the frequency of blood group A was significantly higher among people suffering from pancreatic cancer [20] whereas another study shows blood type A was associated with a lower risk of thyroid cancer, glioma and biliary cancer<sup>21</sup>. Early independent studies showed association of rectal, cervical, leukemia, pancreatic, breast,

ovarian, gastric cancer among individuals with blood group A,AB,B than the individuals with blood group O<sup>22</sup>. Previous studies have shown that people who had blood type O had a lower tendency for the growth and metastasis of tumor<sup>23</sup>. Their exists an association between ALL (Acute lymphoblastic leukemia) and ABO blood group, which shows that people having blood group AB have an increased risk of ALL<sup>24</sup>. Studies concerned about possible association between ABO blood group and CVS diseases have confirmed that people of blood group A are affected more frequently with coronary heart disease, ischemic heart disease, venous thrombosis, atherosclerosis as compared to people having O blood group [25]. O blood group individuals are known to have a 14% reduced risk of squamous cell carcinoma when compared to Non O blood group.

Individuals whereas non O blood group have a lower risk of non melanoma skin cancer [26]. There are findings which are suggestive of a higher risk of nasopharyngeal carcinoma in individuals with blood type A or AB [27]. ABO blood is established as a predictor of survival in patients with laryngeal cancer [28]. In a study, high rate of parasitemia was seen in blood group O [29]. The 'B' antigen links with increased risk of ovarian cancer. Gastric cancer has reported to be more common in blood group A and least common in blood group O<sup>30,31</sup>.

## CONCLUSION

It is advisable to do blood grouping in every institute so that we can supply blood to needy patients during emergency. In short, the generation of a simple database of blood groups not only provides data about the availability of blood in regional calamities but also enables insight into possibilities of the future burden of disease.

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