

# Original Article

## Frequency Distribution of ABO and Rh Blood Groups among Students

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**Received:** 12-07-2013

**Revised:** 28-07-2013

**Accepted:** 29-07-2013

### ABSTRACT:

#### Background:

ABO and Rhesus (Rh) blood groups are helpful in inquiring about populace hereditary qualities, migration patterns, settling medico legitimate issues, especially of debated paternity, and forestalling erythroblastosis foetalis. Blood gather dissemination changes in various groups, races, populaces and furthermore every now and then in a similar district. Consequently the present examination has been directed to decide the ABO and Rh blood group distribution among students. **Materials and Methods:** A review cross sectional investigation was directed to decide the distribution of the type ABO blood gathering and Rh factor. For those people accessible to give blood amid study period, we utilized an interview based organized survey to gather sociodemographic and other clinically helpful information. Blood sample from each student was taken by Scrub the middle finger with a sterile disposable lancet. The assurance of the ABO, Rhesus (RhD) blood groups and hemoglobin electrophoresis was done. **Result:** In our examination, the most frequently occurring blood group was O group (43%) trailed by B (32), A (19%) and AB group (3%). 92% students were Rh positive while just 8% were Rh negative. Same pattern of O,B,A and AB is followed in Rh positive blood group distribution though in Rh-negative, 50% with O group and 28% to B took after by AB also, no A-blood group. **Conclusion:** This investigation affirmed that O blood group is more common than other blood groups among ABO system and AB being the minimum. ABO and Rh antigenic structures contrasted among different populaces and districts over the globe. Rhesus positive blood groups were observed to be more typical than Rhesus negative.

**Key words:** ABO, Rhesus, blood group.

This article may be cited as: Verma SL. Frequency Distribution of ABO and Rh Blood Groups among Students. J Adv Med Dent Scie Res 2013;1(1):72-75.

### INTRODUCTION:

The discovery of the ABO blood groups by Landsteiner was a critical accomplishment in the historical backdrop of blood transfusion that was trailed by the revelation of Rh (D) antigen. The Rh factor was found in 1940 by K. Landsteiner and A.S. Weiner from rabbits vaccinated with the blood of the monkey *Macaca rhesus*.<sup>1</sup> This blood aggregate antigen is likewise found on the surface of human erythrocytes. Around 85% of the populace has Rh antigen on the surface of their erythrocytes and are called Rh positive people. The human blood assemble Rh polypeptide has been utilized to delineate Rh locus, by in situ hybridization, to the locale of

p34.3 – p36.1 of chromosome 19. The blood group substances are acquired as indicated by straightforward Mendelian proportions through different alleles speaking to a solitary locus.<sup>2</sup>

To date around 700 red cell antigens have been perceived by International Society of Blood Transfusion. These antigens are sorted out into 30 human blood group systems and every individual has a remarkable range of blood groups except for indistinguishable twins or triplets whose blood groups are precisely the same.<sup>3</sup> However, the ABO and Rh blood groups are the most vital blood groups up until this point. People are separated into 4 noteworthy blood groups in particular A, B, AB and O groups relying

upon the antigen show on their RBCs. Additionally the human red platelets that convey antigen D are alluded to as Rhesus positive (Rh+) while those without it are Rhesus negative (Rh-).<sup>4</sup>

The revelation of ABO and Rh blood groups has contributed hugely to blood managing an account administrations and transfusion solution. They are valuable in hereditary investigations of populaces and furthermore settling medico-lawful issues like questioned parentage. A few investigations have additionally revealed the relationship of ABO blood group with certain neurotic conditions; for instance a higher commonness of stomach disease has been found among individuals with blood group A, people with O blood group are more powerless to intestinal sickness contamination than non O blood group people.<sup>5</sup> The ABO blood group framework is one of the most grounded indicators of national suicide rate and a hereditary marker of weight. The ABO and Rh blood groups shifts worldwide and are not found in break even with numbers even among various ethnic gatherings.<sup>6</sup>

Assurance of ABO group is essential in pre transfusion investigations of patients and contributors and in addition in instances of patients. There are distinctive systems to decide ABO group in the research center: slide, test tube and micro plate every procedure comes about are deciphered in view of the presence or absence of agglutination response. Sick cell hemoglobin (HbS) contrasts from ordinary hemoglobin (HbA) in light of the fact that it has a valine set up of a glutamic acid in position number six of the beta chain of the globin molecule. At the point when the accessibility of oxygen is lessened, the erythrocytes containing sickle cell hemoglobin change from round to sickle-shaped cells.<sup>7</sup> The sickle cell homozygote (HbSHbS) almost always dies of anaemia. The sickle cell heterozygote (HbAHbS) is just slightly anaemic and has resistance to malaria. The clinical course of sickle cell illness is to a great degree variable. A few patients have almost no indications; others are seriously crippled.<sup>8</sup>

Strangely, aside from the significance of ABO and Rh blood bunches in blood transfusion, they are valuable in populace hereditary examinations, inquiring about populace relocation design. It is, subsequently, basic to have data on the circulation of these blood groups in any populace amass that involve distinctive ethnic gatherings. This present study will be investigated to have information on the distribution of ABO and Rh blood groups among students in North India.

#### **MATERIALS AND METHODS:**

Blood samples from 120 students (75 boys and 45 girls) studying in different colleges in North India were obtained with their consent upon request. Blood tests from every student in college was taken by Scrub the center finger with a bit of cotton immersed with 70% alcohol and pierce it

with a sterile disposable lancet and was put a little drop of blood on a three clean white glass slide on which a couple of drops of antisera for blood group A and B was applied. A drop of each of the antisera, anti A, anti B and anti D was added and mixed with each blood sample, with the aid of applicator stick.

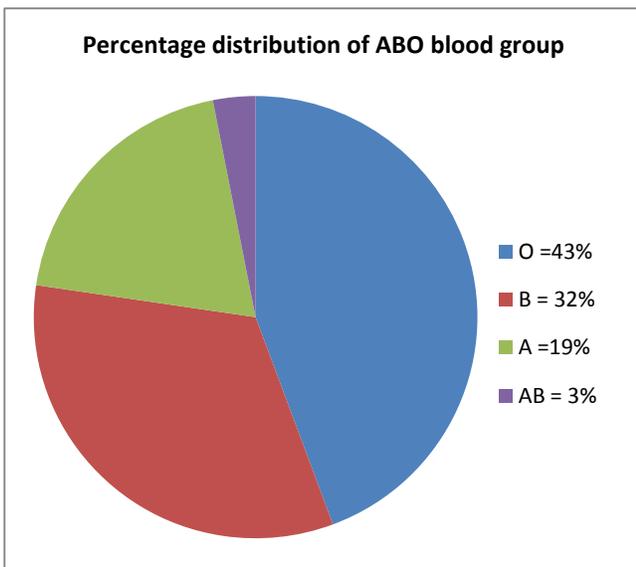
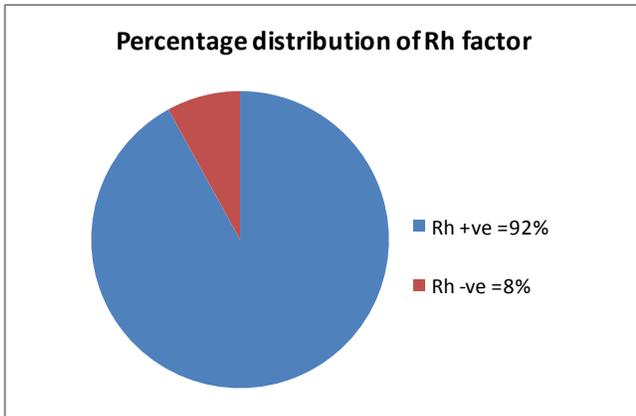
Blood was blended altogether with the antisera and shook tenderly for 60 sec to watch agglutination. The slide was then tilted to recognize for agglutination and the outcome recorded accordingly. In instance of uncertainty, the test was analyzed under a magnifying lens, or the outcomes were affirmed by switch gathering utilizing known group A and B red cells. This methodology was rehashed for every one of the subjects.

The antigen show on the surface of RBC agglutinates with the antibody exhibit in the antisera. Consequently, blood group was determined in light of agglutination with the corresponding anti sera. On the off chance that agglutination was available in the blood drop on slide denoted A, at that point it has a place with A blood group, agglutination in blood drop slide B, B group, agglutination in both A and B drops, AB group and if there was no agglutination in both A and B drops, at that point O group. Thus, agglutination in blood drop on glass slide stamped D was considered as Rh Positive and no agglutination as Rh negative. For the investigation of the blood genotype, cellulose acetic acid derivation electrophoresis strategy was utilized to decide hemoglobin genotype. A little amount of venous blood was put on a tile also, blended with three drops of water to lyse. With the guide of an implement, the haemolysate was set on the cellulose acetic acid derivation paper. Electrophoresis in Tris cradle arrangement was for 15-20 min at an e.m.f of 230V. Haemolysates from blood tests of referred to genotypes were keep running as control. Data were analyzed using the computer statistical analytical software. Frequencies and percentages were calculated.

#### **RESULT:**

One hundred and twenty students (120) were randomly selected among the students of different colleges and were tested. This consisted of 75 males and 45 females between ages of 18 and 28. In our examination, the most frequently occurring blood group was O group (43%) trailed by B (32), A (19%) and AB group (3%). 92% students were Rh positive while just 8% were Rh negative. Same pattern of O, B, A and AB is followed in Rh positive blood group distribution though in Rh-negative, 50% with O group and 28% to B took after by AB also, no A-blood group.

On gender wise examination, 69 out of 75 male students (92%) were Rh positive whereas remaining 6 male (8%) students were Rh negative. Regarding females, 41 out of 45 females (91.11%) were Rh positive and 4 were Rh negative (8.89%).



**DISCUSSION:**

The Landsteiner’s discovery opened the way to the introduction of a wide range of disclosures in the field of immuno-hematology, blood transfusion, legitimate medication, humanities and the revelation of other blood group frameworks, all are regarded as an application or because of Karl's disclosure. ABO and Rh blood group dissemination examines are vital as they assume a noteworthy part in blood transfusion, transplantation of organs, inquire about in the field of hereditary qualities, human development and scientific pathology. Some blood groups are more inclined for a few illnesses like diabetes mellitus, duodenal ulcers, UTI.<sup>9</sup>

Studies demonstrate that A group people are more inclined for cardiovascular sicknesses like coronary illness, venous thrombosis, ischemic coronary illness and atherosclerosis. These cardiovascular sicknesses are more outlandish in individuals with O blood group which expressed to have defensive impact against these. These O group people are

known to have assurance against squamous and basal cell carcinoma with hazard being lessened by 14% and 4% individually when contrasted with different groups. It is additionally known to have less danger of pancreatic tumor. The ovarian disease is more in people having B antigen. A group people have revealed more relationship with gastric malignancy though it is minimum in O group people. In this manner, it is critical to do blood grouping thinks about in every single area in order to draft proper national transfusion strategies and to supply blood amid crisis circumstances.<sup>10</sup>

From this investigation, the frequency of blood group O was the most astounding with percentage frequency of 43%, trailed by blood group B with the percentage frequency of 32%, A blood group a with the percentage of 19% and the slightest percentage frequency is that of blood group AB which is 3%. For the most part, the conveyance of ABO blood group fluctuates starting with one populace then onto the next. In numerous different examinations, blood group O has been observed to be the most widely recognized blood group. Study done in Eastern piece of India, Durgapur by Nag et al<sup>11</sup> and in Southern piece of India by Periyavan<sup>12</sup> et al at Bangalore, Das PK Nair et al<sup>13</sup> et at Vellore and at Davangere by Mallikarjuna S. et al<sup>14</sup> found that commonest blood group was O trailed by B, A and AB which is like our investigation. In any case, as opposed to our investigation, studies directed in India and Pakistan demonstrated blood group B was the most transcendent, trailed by blood group O, A and AB.<sup>15,16</sup> While another examination done in Nepal by Pramanik et al.<sup>17</sup> found the commonest blood group as group A, trailed by blood group O, B and AB. In every one of the examinations referred to and including our examination, blood group AB is the least distributed among the number of inhabitants on the planet.

As indicated by the accessible writing, more than 99% Asians have a place with Rh positive group however among our subjects 92% were Rh +ve and 8% Rh – ve. It is near the discoveries of Parmanik and Parmanik from Nepalese understudies, in Nepal restorative school, Kathmandu.<sup>17</sup> Their subjects were 96.66% Rh+ve and 3.33% Rh – ve. 27 Rh blood group is reported as 5% in Nairobi, 4.5% in Nigeria.<sup>18,19</sup> Blood group dissemination learning isn't imperative for blood donation center administration yet additionally for clinical examinations, topographical data and legal studies. This contemplate uncovers that Rhesus (D) negativity has the most reduced conveyance among the contributors which is like different investigations led on other African landmass.<sup>20,21</sup> The distinguishing proof of Rhesus blood system is imperative to avoid erythroblastosis fetalis, which ordinarily emerges when a Rhesus negative mother conveys Rhesus positive fetus. With the low frequency of Rhesus negativity in our setting the quantity of instances of haemolytic disease of the newborn (HDN) are required to be much lower.<sup>22,23</sup>

The significance of the information of the blood groups and genotypes concerning the wellness of an individual is colossal. The diverse sorts of data are helpful for medicinal conclusion and treatment, hereditary data, hereditary guiding and furthermore for the general prosperity of people. Along these lines, it is basic to do blood grouping contemplates in every area for in general, long haul human welfare and advantages of the country.

#### CONCLUSION:

The blood ABO and Rh blood group shifts among ethnic groups. The pertinence of knowing about the blood group frameworks among various ethnic gatherings in any populace is tremendous. The sorts of data got from the discoveries are valuable for hereditary data, hereditary directing, restorative determination and general and physiological prosperity of people in a populace. And also very importance during emergency and accidental healthy disorder especially, at deficient blood and again for donating.

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**Source of support:** Nil

**Conflict of interest:** None declared

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