

Original article

Distribution of Blood Groups and Rhesus factor among selected sample of Iraqi Students

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ABSTRACT

Background: There exists ignorance of blood groups among many people and surprisingly even among the literates. Despite the importance of this health parameter in blood transfusion, it is also one of the requirement of obtaining driving license and national identity card.

Objectives: The objectives of this study were to determine the frequency of the blood grouping (ABO) and Rhesus (Rh) factor of the blood groups and to determine the awareness on the importance of blood grouping among the study's population

Subjects and methods: The total number of sample size of this study was 278 students were selected randomly. The study was carried out among two cohort of student's population. First cohort was 168 medical students from Faculty of Medicine, while second cohort included 110 non-medical students from Baquba Technical Institute' students. The study samples have their blood groups determined according to that documented before. While those who don't know their ABO & Rh blood grouping marked as DK.

Results: The result of this study shows that the rate of blood grouping were 25.5%, 22.3%, 32.0%, 6.1%, and 16.9 %, for blood group A, B, O, AB, and DK respectively ;while for Rhesus factor blood grouping the results revealed that the rates were 77.0%, 6.1% and 16.9%, for positive, negative and DK respectively.

Conclusion: The blood group O with Rh positive was the most common prevalent among the selected groups, Knowledge of blood group distribution is important for clinical studies, for reliable geographical information and for forensic studies in the population.

Keywords: ABO, blood groups, Rhesus (Rh) factor, students,

Introduction

The ABO & Rhesus (Rh), blood grouping is among the oldest and most important health parameter, most especially in relation to blood transfusion. It is also important in genetics and other heredity determination⁽¹⁾. Currently motor vehicle driving license and National passport are issued on the basis of one's blood group determination. It is also one of the needs

for the national identification program. Despite of all these, many people are ignorant of this important health parameter^(2,3). People have different blood types, known as blood groups. Antigens are hereditary determined and plays a vital role in transfusion safety⁽⁴⁾. The discovery of the ABO blood groups by Karl Landsteiner was an important achievement

in the history of blood transfusion followed by 1 discovery of Rh antigen ⁽⁴⁾. Since 1901, more than 20 distinct blood group systems have been characterized but the ABO and Rhesus (Rh) blood groups remain the most clinically important ⁽⁵⁾. Both these systems are useful in blood transfusion and organ transplantation. The distribution of blood groups has been studied in various populations all over the world during the last half-century ⁽⁶⁾. The frequencies of ABO and Rhesus-D showed great variation from one population to another in different geographic locations, reflecting the underlying genetic, ethnicity diversity of human populations ⁽⁷⁾. Association of blood groups and different disease states have also been investigated for example people with blood group (O), have high risk of peptic ulcer women with blood group (A) have been reported to have endometrial and ovarian cancers more frequently than women with non-A blood groups. Also people with group A have a substantially increased risk for coronary heart disease ⁽⁸⁾. The distribution of ABO blood groups have been shown to work as a strong predictor of national suicide and homicide rates and a genetic marker for obesity ^(7,8). The objective of this study was to determine the frequency of different blood groups and determination

of the predominant of ABO, Rh blood groups among the study population, and creating awareness on the importance of blood grouping.

Materials and methods

This cross sectional study was carried out among two cohorts of students population. The First one was Diyala Faculty of Medicine' students constituted from (168) medical students selected randomly from the six grades of the Faculty. While the second cohort included (110) students selected also randomly from first and second grades of Baquba Technical Institute. The age of the study samples ranging from 17-25 year. The study samples have their blood groups determined according to that documented before. While those who don't know their ABO & Rh blood grouping, they marked as DK.

Data collected from the study groups by a special questionnaire designed by the researches. This questionnaire includes information about gender, age, ABO, Rh-factor, blood grouping, and race.

Descriptive statistic was used for analysis of the data included numbers, percentages, and tables.

Results :

Table 1: Percentage distribution between races and gender of Iraqi students who are included in the study

| Race | Gender | | | |
|---------|--------|------|--------|------|
| | Male | | Female | |
| Arabic | Number | % | Number | % |
| | 82 | 93.1 | 159 | 83.6 |
| Kurdish | 6 | 6.9 | 19 | 10.0 |
| Turkmen | 0 | 0.0 | 12 | 3.4 |
| Total | 88 | 100 | 190 | 100 |

Table.2: Percentage distribution between Rh factor and races among Iraqi students included in the study.

| Rh factor | Race | | | | | | Total | |
|-------------|--------|------|---------|------|---------|------|-------|------|
| | Arabic | | Kurdish | | Turkmen | | | |
| | No. | % | No. | % | No. | % | No. | % |
| Do not know | 47 | 19.5 | 7 | 28 | 0 | 0 | 47 | 16.9 |
| Positive | 179 | 74.3 | 16 | 64 | 6 | 100 | 214 | 76.9 |
| Negative | 15 | 6.2 | 2 | 8 | 0 | 0 | 17 | 6.1 |
| Total | 241 | 100% | 25 | 100% | 6 | 100% | 278 | 100 |

Table.3: Percentage distribution between genders and Rh factor among Iraqi students included in the study.

| Gender | Rh Factor | | | | | |
|--------|-------------|-------|----------|-------|----------|-------|
| | DO not Know | | Positive | | Negative | |
| | No. | % | No. | % | No. | % |
| Male | 11 | 23.4 | 74 | 34.7 | 3 | 16.6 |
| Female | 36 | 76.6 | 139 | 65.3 | 15 | 83.4 |
| Total | 47* | 100.0 | 213** | 100.0 | 18*** | 100.0 |

*47/278 (17%), **213/278 (76.6%) ***18/278 (6.4%)

Table .4: Percentage distribution of gender among Iraqi study samples

| GROUP | Gender | | | | Total | |
|-------------|--------|-------|--------|-------|-------|-------|
| | MALE | | FEMALE | | No. | % |
| | No. | % | No. | % | | |
| Medical | 48 | 57.1 | 120 | 63.2 | 168 | 60.4 |
| Non-Medical | 40 | 42.9 | 70 | 36.8 | 110 | 39.6 |
| TOTAL | 84 | 100.0 | 190 | 100.0 | 278 | 100.0 |

Table.5: Percentage distribution of ABO blood group with gender among Iraqi students included in the study.

| BLOOD GROUP | Medical | | | | Non-Medical | | | | Total | |
|-------------|---------|-------|--------|-------|-------------|-------|--------|-------|-------|------|
| | MALE | | FEMALE | | MALE | | FEMALE | | No. | % |
| | | | | | | | | | | |
| A | 13 | 33.3 | 19 | 21.1 | 18 | 42.8 | 22 | 33.8 | 71 | 25.5 |
| B | 15 | 38.4 | 23 | 25.5 | 13 | 30.9 | 11 | 16.9 | 62 | 22.3 |
| O | 6 | 15.4 | 42 | 46.6 | 11 | 26.1 | 28 | 43.0 | 89 | 32.0 |
| AB | 5 | 12.8 | 6 | 6.6 | 0 | 0.0 | 4 | 6.1 | 17 | 6.1 |
| TOTAL | 39 | 100.0 | 90 | 100.0 | 42 | 100.0 | 65 | 100.0 | 239 | 100 |

DISCUSSION

ABO and Rh blood groups are most important blood groups in human beings⁽⁵⁾. The frequency of four main blood group systems varies in population throughout the world and even in different

parts of country^(6,7). One of the objectives of current study was to increase awareness about the ignorance of blood groups among people. Surprisingly even among the literates that ignorance is present⁽⁷⁾. It

is this ignorance that motivates the researchers for this study. Despite the importance of this health parameter in blood transfusion, it is also one of the requirement of obtaining driving license and national identity card, with the aim of creating awareness on importance of blood grouping and determination of the predominant blood group in the ABO system in the population of the study area^(7,8). The percentage of ABO blood groups were found as were 25.5%, 22.3%, 32.0%, 6.1%, and 16.9 %, for blood group A, B, O, AB, and DK respectively. While for Rhesus blood grouping the results revealed that the percentages were 76.6%, 6.4% and 17.0%, for positive, negative and DK respectively. The result revealed that highest percentage was for blood group (O), the least percentage (6.1%) for AB blood group. This is in agreement with Jay Prakash et.al study, where his results revealed that the average percentage of ABO groups were found as O (34.8%), A (34.3%), B (27.0%) and AB (3.9%). The Rh positive and negative .Distribution in the studied population was 98.6% and 1.4% respectively^(1,6). Overall for medical student's population, blood

Group (B) was most prevalent among males. While blood group (O), was most prevalent among females. On the other hand blood group (A) was most prevalent among males, while for the female the results were same as for female medical students. Regarding Rh factor distribution also varies among the study population, among over all it was 6.4%. percentage of DK was higher among female student and this can be explained by more ignorance among females than males, also males needs more official documents like driving license, military card, sport, swimming card for sport clubs in addition to the care for males more than females in regard to this issue.

The ABO and RhD pattern in both the male and female population studied correlates with previous studies carried out in other part of Nigeria population: like Ogbomosho, Oyo State; Benin.⁽⁷⁾

For second cohort the highest percentage was for blood group (O), followed by A. Blood group AB was least prevalent with 10.9% .Out of total 110 students, 7 (6.4%) students didn't know their blood grouping. O - Positive blood group is significantly high in our population. It is well established that ABO and rhesus (Rh) genes and phenotypes vary widely between ethnic groups and both within and between geographical areas. Regarding the distribution of ABO according to race, although the students 'number from races other than Arab, very small, constituted 6.8%, 4.3% of the study sample for Kurds and Turkmen respectively. So our percentages may be unreliable. The small percentages of those races due to displacement of most Kurds, and Turkmen to Kurdistan and Kirkuk due to insecurity and hard situation in Diyala ,that is why most Diyala population escape from terrorists and military processes and displaced to Northern governorate for security , with particular displacement to Kurds and Turkmen. Mohamad Jaff in his study for ABO blood groups in Kurd stated that the most prevalent blood group was O (37.16%), followed by blood groups A (32.47%) and B (23.84%), whereas the least prevalent blood group was AB (6.53%). The majority 91.73% were Rh positive, and 8.27% were Rh negative. Data showed that among the Rh-positive individuals, 34.03% were O, 29.99% were A, 21.69% were B, and 6.02% were AB. Breakup of the Rh negatives showed that 3.13% were group O, 2.48% were A, 2.15% were B, and 0.51% were AB. Every transfusion center should have a record of frequency of blood group system in their population. It helps in inventory management⁽⁸⁾.

In conclusion; Knowledge of blood group distribution is important for clinical studies, for reliable geographical information and for forensic studies in the population.

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