

Research article

# Distribution of ABO and Rh blood groups in Nepalese medical students

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## ABSTRACT

**Background and Objectives:** The distribution of ABO and Rh blood groups vary from population to population. With an interest of finding out rare blood group in Nepalese population, we studied the blood group distribution was studied in five different medical colleges in Nepal.

**Material and Methods:** Capillary Blood sample were taken to determine blood group of of 2208 twenty two hundred and eight Nepalese students from five different medical colleges, viz. Manipal College of medical sciences, Pokhara; Nepalgunj Medical College, Chisapani, Banke ; College of Medical sciences, Bharatpur, Chitwan; Kist Medical College, Lalitpur and Janaki Medical College, Janakpur were recorded. Slide test method was used to determine the blood group of the subjects.

**Results:** In our study subjects, 28.17% were blood group A, 30.17% were blood group B, 34.87% were blood group O and 6.79% were blood group AB. Similarly, 95.38% were Rh +ve and 4.62% were Rh -ve. The blood group distribution patterns in male and female were different.

**Conclusion:** This result demonstrates that AB blood group is the most rare blood group among the studied Nepalese population, followed by group A, B and O.

**Keywords:** Blood group, ABO, Rh, Nepalese students

## INTRODUCTION

“Donate blood save life”. This is a very popular slogan. Blood donation is becoming popular day by day as a social activity. Modern medicine uses blood and its products by transfusion. The ABO and Rh are the major (clinically significant) blood group antigens though almost 400 of them have been recognized. All of them if mismatched can cause hemolytic transfusion reaction. So, to

avoid the danger of mismatched blood transfusion, the determination of blood groups of those involved in transfusion (donor and recipient) is the most. Among different blood grouping system, ABO and Rhesus system (Rh) is the most important one in blood transfusion. It is very interesting fact that there is an association between certain disorder like peptic ulcers, gastric cancer, thromboembolic diseases, cholera etc and particular blood group [1, 2]. This adds

up the importance of knowing ones blood group in medicine.

It is also an established fact that distribution of blood groups varies from races to races. The frequency of blood groups A, B, O and AB in USA is 41%, 10%, 45% and 4% respectively [3]. About 85% of all white people are Rh +ve and 15% are Rh -ve. In American blacks, the percentage of Rh +ve is about 95% [4] and in Asians 99% are Rh +ve [3]. Nepalese are racially different from other population. So, we were interested in finding out the rare blood group and the distribution of ABO and Rh groups among the Nepalese students in this medical college.

**MATERIALS AND METHODS**

Blood groups (ABO and Rh) of 2208 twenty two hundred and eight Nepalese students from five different medical colleges, viz. Manipal College of medical sciences, Pokhara; Nepalgunj Medical College, Chisapani, Banke ; College of Medical sciences, Bharatpur, Chitwan; Kist Medical College, Lalitpur and Janaki Medical College, Janakpur were recorded. Students themselves in guidance of faculty determine their blood group in physiology practical classes. They use slide test method to determine their blood group. For the determination of blood group of a subject, a drop of each anti sera, anti A, anti B, and anti D is placed on three glass slides and slides were marked as anti A, anti B, anti D and placed above moist filter paper. Healthy prick was made on the ring finger of the subject and few drop of blood was mixed with saline and then placed in each marked slide with anti-sera. The blood/diluted blood drops was mixed with its respective anti sera using separate glass rods. The slide was observed for agglutination. The agglutination was

confirmed by seeing under microscope (low power). ABO blood groups were determined on the basis of agglutination as shown in table 1. For Rh system: If agglutination occurred with anti D, then the subject was Rh +ve, if not, s/he was Rh -ve.

**Table 1: Guideline for determination of ABO blood group**

Agglutination with anti-A	Agglutination with anti-B	Blood group
+	-	A
-	+	B
-	-	O
+	+	AB

+, agglutination present; -, agglutination absent

**RESULTS**

The distribution of blood groups A, B, O and AB and also Rh groups are shown in Table 2. The rare blood group among our study subjects was AB (6.79% only). The commonest blood group was found to be O, followed by B then A.

**Table 2: The distribution of ABO and Rh blood groups in whole study subjects**

Blood groups	Number of students (percentage)		
	Rh +ve	Rh -ve	Total
A	598 (27.08%)	24 (1.09%)	622 (28.17%)
B	638 (28.90%)	28 (1.27%)	666 (30.17%)
O	724 (32.79%)	46 (2.08%)	770 (34.87%)
AB	146 (6.61%)	4 (0.18%)	150 (6.79%)
<b>Total</b>	<b>2106 (95.38%)</b>	<b>102 (4.62%)</b>	<b>2208 (100%)</b>

The percentage of Rh +ve and Rh -ve subjects were 95.38% and 4.62% respectively. There were differences in distribution of blood groupings between male and female which are shown in table 3 and 4.

**Table 3: The distribution of ABO and Rh blood groups in male subjects**

Number of students (percentage)			
Blood group	Rh +ve	Rh -ve	Total
A	364 (24.17%)	14 (0.93%)	378 (25.10%)
B	462 (30.68%)	8 (0.53%)	470 (31.21%)
O	514 (34.13%)	40 (2.66%)	554 (36.79%)
AB	104 (6.90%)	0 (0.00%)	104 (6.90%)
<b>Total</b>	<b>1444</b> <b>(95.88%)</b>	<b>62</b> <b>(4.12%)</b>	<b>1506</b> <b>(100%)</b>

**Table 4: The distribution of ABO and Rh blood groups in female subjects**

Number of students (percentage)			
Blood group	Rh +ve	Rh -ve	Total
A	234 (33.33%)	10 (1.43%)	244 (34.76%)
B	176 (25.07%)	20 (2.85%)	196 (27.92%)
O	210 (29.92%)	6 (0.85%)	216 (30.77%)
AB	42 (5.98%)	4 (0.57%)	46 (6.55%)
<b>Total</b>	<b>662</b> <b>(94.30%)</b>	<b>40</b> <b>(5.70%)</b>	<b>702</b> <b>(100.00%)</b>

## DISCUSSION

The distribution of ABO and Rh blood groups vary from population to population. Available literature indicates that over 99% Asian are Rh +ve [3] but among our subjects 95.38% were Rh +ve and 4.62% Rh -ve. It is close to the findings of Parmanik and Parmanik from Nepalese students in Nepal medical college, Kathmandu. Their subjects were 96.66% Rh +ve and 3.33% Rh -ve [5]. Rh<sup>-</sup> blood group is documented as 5% in Nairobi [6], 4.5% in Nigeria [7] and 7.7% in Rawalpindi studies [8].

The distribution of A, B, O and AB blood groups among European has been reported to be 42%, 9%, 46% and 3% respectively. But in our study subjects, 28.17% were blood group A, 30.17% were blood group B, 34.87% were blood group O and 6.79% were blood group AB. AB blood group is rare in our subject which is also true in students from Nepal medical college, Kathmandu. In them, blood group A was the commonest followed by O then B and AB. But among our subjects, the commonest one is blood group O followed by B then A and AB.

Such inconsistency of data suggests that further study or survey of blood groups in Nepalese population is essential to know the exact picture. Such types of survey or study will also be helpful in creating a blood-group directory, which can be used in calling the donor at the time of need. Such survey can also help to make the illiterate public aware of the essential of knowing blood groupings and blood donation.

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