



# Distribution of Blood Group among Children in a Tribal Colony near Bengaluru, Karnataka, India- A Cross-sectional Study

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## ABSTRACT

### Background

ABO and Rhesus (Rh) blood groups are utilitarian tool in resolving medico legal issues, identifying, and preventing erythroblastosis fetalis and researching population genetics. Blood groups varies among various group of population with different ethnicity and geographic locations throughout the world. The Hakki-Pikki tribal population is one of the diminishing tribes in Karnataka who have now moved out of the forest and made city as their homes. This study assessed the distribution of blood groups among school children of Hakki-Pikki tribal colony, Gowripura, Bengaluru, Karnataka, India.

### Materials and Methods

Samples of 76 children (32 boys and 44 girls) of age 6 to 14 years of Hakki-Pikki tribal Colony, Gowripura, Bengaluru Karnataka, India were tested for blood group and Rh typing by Matrix Octoplus Forward and Reverse Grouping Card with Sub Grouping.

### Results

Blood group O positive 40(52.63%) was more frequent and followed by B positive 33(43.42%), A positive 2(2.63%). Rh positive participants (98.68%) were more than Rh negative (1.32%). In this study, Blood group among boys were O (53.12%), B (40.62%), A (6.25%), and in girls were B (46.51%) and O (53.48%). There is a significant difference only in A (0.0455) Blood group with respect to gender.

**Conclusions:** Blood group distribution among Hakki-Pikki tribal children is O positive > B positive > A positive > B negative and Rh positive more than Rh negative. No AB blood group was found.

**Keywords:** Blood group, Hakki-Pikki, Karnataka, Tribal

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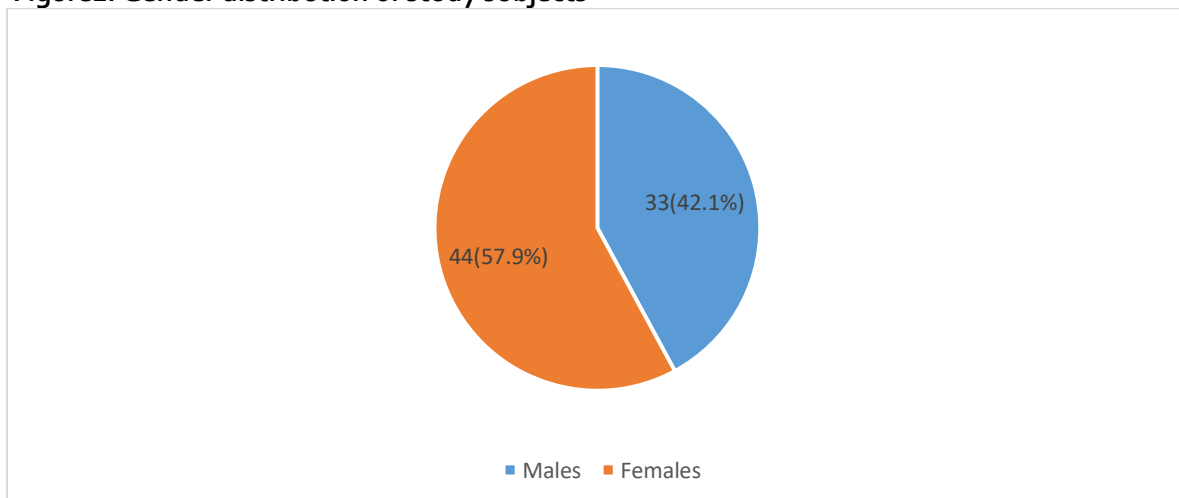
## INTRODUCTION

In India 8.6% of the total population and 6.95 % of Karnataka's population represents tribal communities<sup>1,2</sup>. The Hakki-Pikki tribes earlier living in forests, hunting animals and birds for their livelihood are one of the diminishing tribes in Karnataka<sup>3</sup>. Human ABO blood group plays an important role in cell's physiology and pathology<sup>4</sup>. Studies found that an association of cancers, cardiovascular, rheumatological and infectious diseases and ABO blood group<sup>5</sup>. Certain disorders are more frequently associated with certain blood groups as compared to the others as O blood group is associated with a higher prevalence of hypertension and melanoma whereas non O blood groups are associated with higher incidence of arterial and venous thromboembolism<sup>6,7</sup>. Recently Rana R *et al*, found that A, B and Rh positive blood groups are more susceptible to COVID 19 infection<sup>5</sup>. With the above background, this study was carried out to assess the distribution of ABO and Rh(D) blood group of Hakki-Pikki tribal colony, Gowripura, Bengaluru, Karnataka, India.

## MATERIALS AND METHODS

Community based cross-sectional study was carried out for a period of six months at RajaRajeswari Medical College, Bengaluru, approved by the Institutional Ethics Committee (RRMCH-IEC/58//2022). Written informed consent from the school authority and parents were taken. The school was visited on pre-assigned day of each week to collect the required data and blood samples were collected from study subjects.

**Figure1: Gender distribution of study subjects**



## Study population

Total population of the Hakki-Pikki colony was 420, among them 97 were school (Government Higher Primary school, Gowripura) going children. Study included 76 (32 boys and 44 were girls) and excluded 21 students as their parents were not willing to give consent.

## Sample collection

Venous blood was collected in the potassium EDTA (Ethylene diamine tetra acetic acid) vacutainers using aseptic precautions by trained phlebotomists. After ensuring proper sample, labeled samples were transported to the laboratory maintaining strict cold temperature for blood grouping. Blood group and Rh typing was done by Matrix Octoplus Forward and Reverse Grouping Card with Sub Grouping.

## Statistical Analysis

Data was collected and compiled in MS Excel and analysed using IBM SPSS Statistics (Version 23). Data were summarised using descriptive statistics such as frequency and percentages and inferential statistics is used to find the significant difference between Boys and Girls with respect to Blood group by using Z test for Proportions.

## RESULTS

The demographic profile of 76 study subjects, majority of them 44 (57.90 %) were females and 32 (42.10 %) males. (Figure:1)

The age group of the children ranged from 6 to 14 years, the mean age of study subjects was 11.3 years  $S.D \pm 2.6$  yrs. Overall distribution of Blood Group among study subjects were as follows O positive blood group 40(52.63%) > B

positive 33(43.42%) > A positive 2(2.63%) > B negative 1(1.32%) in the Hakki-Pikki tribal children. Rh positive participants (98.68%) were more than Rh negative (1.31%). No AB blood group was found (Table 1).

**Table-1: ABO and Rh Blood group Distribution among Children.**

Blood group	Rh positive	Rh negative	Total	
			n	%
A	02(02.63%)	00(00%)	2	02.63
B	33 (43.42%)	01(1.32%).	34	44.74
O	40 (52.63%)	00(00%)	40	52.63
AB	00 (00%)	00(00%)	00	00
<b>Total</b>	75(98.68%)	01(1.32%).	76	100

It was observed that blood group of Rh positive A(6.25%), B(40.62%) and O(53.12%) were seen among male study subjects and B (46.51%) and

O(53.48%) were predominantly seen among female study subjects. (Table -2).

**Table 2: Gender wise Distribution of Blood group System**

Blood group	Boys (n-32)	Girls (n-44)	Total	Z-Test	P-value	
A	02 (6.25%)	00	02	02.63(%)	2	0.0455
B	13 (40.62%)	20 (46.511%)	34	44.74(%)	-1.94	0.0523
O	17 (53.12%)	23 (53.48%)	40	52.63(%)	-1.34	0.1802
AB	00	00	00	00		
<b>Total</b>	32 (42.10%)	43 (56.58%)	76	100(%)		

There is a significant difference only in A Blood group and there is no significant difference in

other Blood groups like B and O with respect to gender.

## DISCUSSION

Tribal communities are geographically distinct; with each tribe having its own unique customs, traditions, beliefs and practices. Karnataka has a sizeable population of tribal people. The Hakki Pikki tribes, belongs to semi-nomadic group<sup>2</sup>. Tribal populations are isolated from the general population by their own socio-economic and physical environment<sup>8</sup>. Awareness of blood group is important for blood transfusion, organ

transplantation, inventory management and blood group related disorders<sup>9</sup>.The ABO and Rh blood group system first discovered by Karl Landsteiner in 1900<sup>10</sup>.Geographical conditions, race, allelic drift, ethnicity, migration of population may influence the distribution of blood group among population. The knowledge of blood group distribution has great importance for safe blood transfusion and

disorders associated with the blood group in specific area with specific tribes<sup>9</sup>. The international society of Blood Transfusion recognized the 43 blood group systems with 345 antigens for human RBCs<sup>11</sup>. In this study, we observed that blood group distribution among Hakki-Pikki tribal children was O positive blood group 40(52.63%) > B positive 33(43.42%) > A positive 2(2.63%) > B negative 1(1.32%). Rh positive participants (98.68%) were more than Rh negative (1.32%). No AB blood group was found. Our study results are similar to the Periyavan S et al, Sigamani K et al, Suresh B et al and Das PK et al studies done in south India<sup>12-15</sup>. Periyavan S et al, demonstrated that the blood group distribution in Bangalore follows the Asiatic trend of O (39.81%) > B (29.95%) > A (23.85%) > AB (6.37%) (12). Sigamani K et al, Suresh B et al and Das PK et al showed that in south India the distribution of blood group follows O>B>A>AB<sup>13-15</sup>. The data of our study are in agreement with the rest of India, where the blood group O is the commonest and AB is the least as shown by Agrawal A et al<sup>16</sup>. Patidar GK et al, in 2021 depicted that the overall frequency of blood groups distribution in five regions (Northern, Eastern, Southern, Western and Central) of India was O (34.5%) > B (34.10%) > A (23.16) > AB. In Australia, Britain, USA and in Saudi Arabia also O blood group was the commonest<sup>9</sup>. In contrast to our study results, Balgir RS et al, and Subhashini AB et al Studies

of blood group distribution among tribal population of Andhra Pradesh and Pondicherry respectively observed that the highest frequency of B followed by O then A and AB allele<sup>17,18</sup>. Begaum D et al, found in 57 tribal communities that A and O blood group more frequent and AB blood group was least frequent<sup>19</sup>. This study showed that blood groups among the tribal settled in Hakki-Pikki colony are similar to blood group distribution among Urban Bangalore and South India. No rare variety of blood was found among the study subjects.

### CONCLUSION

Blood group distribution among Hakki Pikki tribal children was O positive > B positive > A positive > B negative and Rh positive are more than Rh negative. The results are similar to other parts of India. No special type of blood group was found among the school going tribal children. We recommend that similar studies can be taken up among adult population to assess blood group

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