

Distribution of ABO and Rhesus blood groups among Tribal Students of Arunachal Pradesh, India

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KEYWORDS

ABO, blood groups, rhesus, Apatani, Galo, Monpa, Nyishi, Tagin

ABSTRACT

All human populations share the same known blood systems. The best-known blood type classification is the ABO system, which is often coupled with another system, the Rhesus blood type (expressed as Rh+ve or Rh-ve). Overall, in human, the O blood type (usually resulting from the absence of both A and B alleles) is very common around the world while the majority of the human in the world have the Rh+ve blood type. The goal of the present study was to find out the distribution and prevalence of ABO and Rh Phenotype blood groups in the students' population belonging to different tribes. A total of 664 blood samples were collected over a period of one year from the students of BSc and BCom belonging to 21 different tribes of the state. However, due to insignificant number of some tribes, only students from five tribes were considered for the data interpretation namely Nyishi(378)>Galo(81)>Apatani(51)>Tagin(51)>Monpa(41). Accordingly, determination of various blood groups namely (ABO and Rh) blood groups were performed. Results: Out of the total sample the most common blood was O blood group comprising 263 (39.6%) followed by A group 181 (27.3%), B 161 (24.24%) and AB 59 (8.9%). 656 (98.8%) of the total samples were Rh positive while 8 (1.2%) were Rh negative. The distribution of blood group O was highest among the students closely followed by A, B and AB. The frequencies of Rh positive and Rh-negative students are 98.8% and 1.2% respectively.

Introduction

Over the years several extensive studies have been conducted to understand the distribution of ABO blood group frequency at global level by researchers around the world. Indian anthropologists too have generated huge amounts of anthropometric data across the length and breadth of the county. In similar line, several studies have also been undertaken in Arunachal Pradesh on the biological aspect of the *Arunachalee* tribes at different times by different scholars. Some of the significant works on serology and biochemical traits includes Bhattacharjee (1954) on the blood group of the *Abor* (now *Adis*); Kumar (1955; 1975) on blood group and secretor frequency among the *Gallong* (now *Galo*); Bhattacharjee (1957) on the ABO, MN, and ABH secretion among the *Noctes*; Kar (1975) on the Rh blood group among the *Adis* of Pasighat; Duarah (1979) on the distribution of ABO, MN and Rh blood groups among the *Mishmis*; Duarah (1980) on the ABO blood groups of the *Sulung* (now *Puroik*) of *Subansiri* District; Kotal et al. (2003) on the frequency and distribution of ABO and Rh (D) blood group among *Digaru Mishmis*. However, the most extensive anthropological research on the different tribes of Arunachal Pradesh covering the various physical, biological, and genetic aspects - Anthropometry, Blood groups, PTC taste sensitivity, and Dermatoglyphics was done by M. C. Goswami and P. B. Das in 1990 in their work *The People of Arunachal Pradesh: A Physical Survey*.

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All these works are valuable piece of sources to be consulted for any analysis of blood frequency and distribution among the different tribes of Arunachal Pradesh.

Undoubtedly, the most extensive and more importantly, comparative work has been the work of Goswami and Das (1990). The study reveals that A blood group occurs in the highest frequency among the *Howa*, *Sherdukpen*, *Kalaktang Monpa* and *Miji* followed by O, B and AB blood groups. Among the *Nyishi* and *Dirang Monpa* O and A occur almost in equal frequencies followed by B but among the *Tawang Monpa* O, A and B occur almost in equal frequencies. The *Aka* show highest frequency of O blood group, followed by A, B and AB. In *Hill Miri* blood group O (44.08%) occurs in the highest frequency, followed by A (33.06%) B (16.33%) and AB (6.53%). In *Tagin* A (36.88%) is closely followed by B (33.44%). In *Apatani* frequency of A (41.56%) is much higher than that O (27.40%). In *Galo*, O blood group occurs in the highest frequency (40.19%). O blood group is followed by A (31.52%), B (20.86%) and then AB (7.03%) in *Galo*. Among *Digaru Mishmi*, *Miju Mishmi*, *Idu Mishmi* and *Khampti*, O blood groups occur in the highest frequency. The percentage of O blood group in *Digaru Mishmi* and *Miju Mishmi* is as high as 64.20 and 53.96 respectively. In *Idu Mishmi* and *Khampti*, it is almost equal being 45.34 and 44.71 respectively. A blood group is more frequent than B blood group in *Digaru Mishmi*, *Miju Mishmi* and *Idu Mishmi*, but reverse is the case in *Khampti*. Among the *Nocte*, *Singpho*, *Tangsa* and *Wancho* populations' O blood group occurs in the highest frequency. The frequency of A is higher than B among the *Nocte*, *Wancho* and the *Singpho* but among the *Tangsa* the reverse is true.

No doubt several studies have been undertaken to examine the distribution of blood groups among different tribes over the years. Still our knowledge of the prevalence and distribution of ABO and Rh blood group in the state is insufficient to draw a clear picture. Hence, in this paper, an attempt is made to understand the status of the students of five tribes (*Nyishi*, *Galo*, *Apatani*, *Monpa*, and *Tagin*) of *Dera Natung* Government College with respect to the selected serological markers.

Arunachal (the Land of Dawn) is located in the extreme north-eastern corner of India. It is bordered by Bhutan on the west, China (Tibet) on the north and north-east, Myanmar on the east and south-east and the States of Assam and Nagaland to its south. The State has a territory of 83,743 square kilometer. It is the homeland for a large number of tribes that exhibit cultural heterogeneity in spite of having some common cultural and linguistic elements (Chaudhuri & Tayeng, 2015). Of the many communities, the more prominent ones (due to their numerical strength) are the *Nyishi*, *Adi*, *Galo*, *Apatani*, *Mishmi*, *Tagin*, *Khampti*, *Khamiyang*, *Singpho*, *Tangsa*, *Nocte*, *Wancho*, *Monpa*, *Sherdukpen*, *Aka*, *Bugun*, *Bangro*, *Yobin*, *Memba*, *Nah*, *Puroik*, *Meyor*, *Sartang* and *Miji*.

The ABO blood groups are fairly widely known. All human populations share the same known blood systems (Mourant 1962: 291). Overall, we know of more than 15 different blood type systems whose alleles appear in variable frequencies across the human species (Agustín, 2012: 312). The first deliberate observations on the incidence of the blood groups in different populations were carried out by Hirsfeld & Hirsfeld in 1919 at Salonica at the end of the First World War (Mourant, 1959: 140). Today, ABO blood group and Rhesus factor are the most investigated blood group system in man, and because of the ease of identifying their phenotypes, they have been used as genetic markers of populations (Reid *et al.*, 2001).

Overall, in human, the O blood type (usually resulting from the absence of both A and B alleles) is very common around the world. About 63% of human share it. The A blood allele is somewhat

more common around the world than B. About 21% of all people share the A allele. B is the rarest ABO blood allele. Only 16% of humanity have it (Molnar, 2002). Nation wise, blood groups O is the prevalent group among the British, American, Malaysians, Saudi Arabian (Giri *et al.*, 2011). Similarly, a study of Nigerian by Eru, Adeniyi and Jogo (2014) showed prevalence of O blood group in Nigeria. However, according to Raja et al (2016) there is a prevalence of B blood group in India. So far Rhesus factor distribution is concerned, the percentage frequency of Rhesus negative is higher in several countries (Giri *et al.*, 2011). Ganong (2003) noted Rhesus negative is most common in Caucasians, less common in Blacks and rare in Asians.

The knowledge of the distribution of ABO and Rh blood groups are useful in population genetics, researching population migration patterns, interaction patterns, as well as resolving certain medico-legal issues, particularly of disputed paternity and more importantly in compatibility test in blood transfusion practice. Hence, the knowledge of blood group distribution among different students belonging to five different tribes is of important dependable information and it will aid a lot in furthering population genetic studies.

The study depicts the distribution of ABO and Rh blood groups among the student community of *Dera Natung* Government College, Arunachal Pradesh. Though done on a small-scale, hopefully this study will throw light on the distribution of ABO and Rh blood frequency among five different tribes.

Materials and Methods

This cross sectional observational study conducted over BSc and BCom students of *Dera Natung* Government College, Itanagar for a period of one year (from 2019-2020). Stream of all Bsc and Bcom i.e. IInd, IVth and VIth semester of the session 2019-2020 were taken as sample. The students list of the Bsc and Bcom stream as well as the blood group status and tribal status of every student were collected from the recorded data in the student profile from the *Dera Natung* Government College website. After this student were sorted according to their domicile and schedule tribe status and accordingly non Arunachal Pradesh Schedule Tribe (APST) and the students outside the domicile of the state were excluded in the study.

After the sortation of 644 students thoroughly, it was found that the students belonged to 21 different tribes –*Nyishi*, *Galo*, *Apatani*, *Tagin*, *Monpa*, *Adi*, *Nocte*, *Tangsa*, *Wancho*, *Memba*, *Aka*, *Khamti*, *Mikir*, *Sartang*, *Miji*, *Mishmi*, *Singhpoh*, *Miri*, *Puroik*, *Sherdukpen* and *Tutsa* as shown in Table I. However, due to the geographical location of the college, the students belonging to *Nyishi* tribes were extensively higher in number as compared to the rest. *Adi* students were 19 in number and while students of the remaining of the 16 tribes population were found to be insignificant. Hence, only students from five tribes (*Nyishi*, *Galo*, *Apatani*, *Tagin* and *Monpa*) were considered for the data interpretation though students from other tribes were also studied. As such among the selected sample were *Nyishi* (378)>*Galo* (81)>*Apatani* (51)>*Tagin* (51)>*Monpa* (41). Therefore, the total number of selected samples for analysis were (378+81+51+51+41)=602.

After the sortation of the students according to their blood status, schedule tribe status and domicile status, statistical analysis was then performed. The frequency of each O, A, B and AB and Rh+ve and RH-ve blood group was calculated by direct count. The collected data were then entered into Microsoft excel sheet and then were presented in text, tables and histograms.

Results

The study depicts the distribution of ABO blood groups and Rh blood group among the students of *Dera Natung* Government College belonging to five different tribes. Out of the total sample the most prevalent blood group was O blood group comprising (39.6%) followed by A group (27.3%), B (24.24%) and AB (8.9%) as shown in Table II. So far, Rh blood group is concerned, the overall students have Rh positive (98.8%) and Rh negative (1.2%) as shown in Fig I.

Nyishi: As shown in the Fig II, among the 378 students 157 had O blood group (41.5%). Of this 154 (98.08) had Rh+ve and 3 (1.9%) had Rh-ve. 116 had A blood group (30.7%). 114 had Rh+ve and 2 had Rh-ve. 76 had B blood group (20.1%). 75 had Rh+ve and 1 had Rh-ve. 29 had AB blood group (7.7%). All were Rh+ve. I.e. O>A>B>AB.

Galo: As shown in Fig III, among the 81 students 35 had O blood group (43.2%). All had Rh+ve. 16 had A blood group (19.8%). All were Rh+ve. 23 had blood group (28.4%). All were Rh+ve. 7 had AB blood group (8.6%). All were Rh+ve. I.e. O>B>A>AB.

Apatani: As shown in Fig IV, among 51 students 15 had O blood group (28.3%). All were Rh+ve. 16 had A blood group (30.2%). All were Rh+ve. 15 had B blood group (28.8%). All were Rh+ve. 7 had AB blood group (13.2%). All were Rh+ve. I.e. A>O>B>AB.

Tagin: As shown in Fig V, among 51 students 17 had O blood group (33.3%). All were Rh+ve. 15 had A blood group (29.4%). All were Rh+ve. 13 had B blood group (25.5%). All were Rh+ve. 6 had AB blood group (11.8%). Of this 5 (83.33%) were Rh+ve and 1 (16.66%) was Rh-ve. I.e. O>A>B>AB.

Monpa: As shown in Fig VI, among 41 students 15 had O blood group (37.5%) and all were Rh+ve. 2 had A blood group (5%). All were Rh+ve. 17 had B blood group (42.5%). All were Rh+ve. 6 had AB blood group (15%). All were Rh+ve. I.e. B>O>AB>A.

The overall student students have shown O blood group of 263 (39.6%), A blood group of 181 (27.3%), B blood group of 161 (24.24%) and AB blood group of 59 (8.9%). The overall students have shown Rh positive blood group of 656 (98.8%) and Rh negative blood group of 8 (1.2%).

Discussion

This study revealed that the overall blood group distribution of the tribal student followed the general pattern of blood group frequency found around the world, O>A>B>AB (39.6%) blood group have the highest frequency followed by A (27.3%), B (24.24%) and lastly AB (8.9%) had the lowest frequency.

The study also revealed that the blood group distribution of *Nyishi* and *Tagin* students were in accordance with the overall blood group frequency distribution, O>A>B>AB. However O blood group frequency (41.5%) of *Nyishi* was more similar with the overall O blood group frequency (39.6%) than *Tagin* (33.3%).

It was also observed that the rest of the students belonging to the three tribes-*Apatani*, *Galo* and *Monpa* showed deviation from the overall blood group distribution. *Galo* had O blood group as the leading blood group frequency but B blood group (28.4%) followed O instead of A (19.8%).

In *Apatani* A blood group had the highest (30.2%) frequency. *Monpa* showed the largest deviation in blood group distribution from the overall norm. B blood group was found to have the highest frequency (42.5%), followed by O (37.5%) blood group and then AB (15%) blood group. A blood group had the least frequency (5%).

In comparing the present study with the earlier study conducted by Tage Dumi (2019), it was found that both the study showed similar pattern of overall blood group distribution i.e. O (39.1%)>A(30.65%)>B(22.24%)>AB(7.28%). *Nyishi* and *Tagin* showed similar pattern, O(42.56%)>A(30.06%)>B(20.94%)>AB(6.41%) and O(33.3%)>A(30.03%)>B(21.21%)>AB (15.15%) respectively. *Apatani* also showed the same sequence, A(34.78%)>O(32.06%)>B(23.91%)>AB(8.69%). Only *Galo* tribe showed deviation, earlier study showed O(39.28%)>A(30.35%)>B(23.21%)>AB(8.69%) but present study showed O>B>A>AB.

After comparing the present scenario of blood group distribution of the five tribes, it was compared with the earlier work done in 1990 by M.C. Goswami and P.B. Das (the only extensive work done on the tribal population of Arunachal Pradesh). During comparison it was found that the *Nyishi* tribe followed the same sequence, O (33.58%)>A (32.23%)>B (25.25%)>AB (8.68%). *Galo* tribe showed difference, previous study followed general norm O>A>B>AB but the present study showed O>B>A>AB. *Apatani* showed similar pattern, A (44.13%)>O (27.83%)>B (19.78%)>AB (8.24%). Previous study of *Tagin* tribe followed A>O>B>AB in contrast to present observation. And lastly *Monpa* showed B>A>O>AB in earlier study and B>O>AB>A. Here also *Monpa* showed largest deviation in each study.

According to the National Center for Biotechnology Information, the norm followed in eastern India and overall India were O (34.8%)>B (33.6%)>A (23.9%)>AB (7.7%) and O (37.12%)>B (32.3%)>A (22.9%)>AB (7.74%) respectively. According to Raja et al (2016), B blood group (34%) was found more prevalent than O (32%) in India. This data showed dissimilarity from our finding of O>A>B>AB.

In Rhesus system our study showed that Rh positive blood group was more prevalent, in fact it consisted of 98.8% of total sample population in contrast to meager 1.2% of Rh negative population. Overall distribution of Rh frequencies in India shows 94.61% Rh+ve and 4.39% Rh-ve (Giri et al, 2011).

During the project another set of fact came into the view. After the Data analysis and formulation of result it was discovered that the frequency distribution of A, B, Antigen in these five tribes was found to be relatively higher than the normal/general standard. The general percentage for A, B antigen frequency distribution for a population is 55%, but the observation that we derived from our survey was *Nyishi* (58.5%), *Galo* (56.8%), *Apatani* (71.7%), *Tagin* (66.7%) and *Monpa* (62.5%).

The inference that we can draw from this table is the sequence of A, B antigen frequency distribution among the tribe: *Apatani*> *Tagin*> *Monpa*> *Nyishi*> *Galo*.

Apatani had the highest percentage of antigen distribution i.e. almost 72% of the total *Apatani* students had antigens present in their RBC. This high percentage can be attributed to the presence of high frequency of A and B blood group among the population. The high AB blood group (13.2%) frequency in the population can also be accredited to this. It is followed by *Tagin* tribe with a

frequency of 67%. The high % of AB blood group (11.8%) must be due to the presence of high antigen frequency and low O group %. *Monpa* tribe follows *Tagin* tribe and have high % of A, B antigen (63%). The antigen frequency of *Galo* (56.8%) and *Nyishi* (58.5%) tribe are closer to each other and to the standard value of 55%. The inference that we can arrive is that this five major tribe have high frequency of A, B antigen present on the RBC in a population.

Conclusion

It is quite clear from the study that distribution pattern is complex. The extent to which these tribal groups resemble or differ from each other suggests complicated evolutionary history and migration. We observed from our study that the most common blood group among the tribal students is O blood group (39.6%) and the least prevailing is AB blood group (9.1%). Rhesus positive (98.8%) is much more common than Rhesus negative (1.2%) among tribal population in respect to Indian population. The tribal population of Arunachal Pradesh shows high percentage of presence of A, B antigen in the Erythrocytes/RBC.

The present study concludes that the distribution of Blood group O is highest among the students comprising (39.6%) closely followed by A group (27.3%), B (24.24%) and AB (8.9%). Majority of the samples showed positivity for Rh (98.8%). The study also reveals that O blood group occurs in the highest frequency among the students of *Nyishi*, *Galo*, and *Tagin*. While among the *Apatani* students show highest frequencies of A. Whereas among *Monpa* students B has the highest frequencies. In *Nyishi*, O blood group is followed by A, B and AB. In *Galo*, O blood is followed by B, A and AB. In *Tagin*, O blood group is followed by A, B and AB. Among *Apatani*, A is followed by O, B and AB while among *Monpa*, B is followed by O, AB and A. The percentage of Rh+ve is high among all students belonging to five different tribes. The distribution of AB is very low among all the students, however further study is required on a larger scale as this study was done in a college set up that too in a very short period of time.

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Informed Consent *Informed consent was obtained from all individual participants included in the study.*

Conflict of Interest *The Authors declares that there is no conflict of interest.*

References

- Bhattacharjee, P.N. (1954). Blood group investigations in the Abor (Adi) tribe. *Bulletin of the Anthropological Survey of India*, Govt. of India, 3(1): 51-54.
- Bhattacharjee, P.N. (1957). A study on ABO, MN blood groups, and the ABH secretion in the Nocte in the NEFA. *Bulletin of the Anthropological Survey of India*, Govt. of India, 6(1): 77-80.
- Chaudhuri, S. K., & Tayeng, Ratna. (2015). Growth of Anthropological Research in Arunachal Pradesh: Limits and Possibilities. *The Indian Journal of Anthropology*: 3 (2): 01-48
- Duarah, D.K. (1979). Distribution of ABO, MN, Rh blood groups among the Mishmis (Taraons) of Lohit, Arunachal Pradesh. *Resarun*, 5(2): 22-28.
- Duarah, D.K. (1980). A study on ABO blood groups and some genetic traits of the Sulung of Subansiri district, Arunachal Pradesh. *Resarun*, 6(2): 19-29.
- Dumi, Tage, (2019). *Awareness of Blood Group among students of Arunachal Pradesh*, Unpublished BA Dissertation submitted to Department of Zoology, Dera Natung Government College, Itanagar, Arunachal Pradesh.
- Eru, E.U., Adeniyi O.S., Jogo A.A. (2014). ABO and Rhesus blood group distribution among students of Benue State University Makurdi, Nigeria. *African Journal of Biomedical Research*. 17: 49-52.
- Fuentes, Agustín. (2012). *Biological anthropology: concepts and connections*. New York: McGraw-Hill.
- Giri, P. A., Yadav, S., Parhar, G.S., Phalke, D.B. (2011). Frequency of ABO and Rhesus Blood Groups: A Study from a Rural Tertiary Care Teaching Hospital in India. *International Journal of Biological Medical Research*, 2(4): 988-990.
- Goswami, M.C. and Das, P. B. (1990). *The People of Arunachal Pradesh: A Physical Survey*. Itanagar. Directorate of Research, Govt. of Arunachal Pradesh.
- Kar, R.K. (1975). The Rh blood group among the Adi of Pasighat, Arunachal Pradesh. *Eastern Anthropologist*, 28(2): 165-168.
- Kotal, M., Barus, P., & Sengupta, S. (2003). Genetic study among the Digaru Mishmis of Arunachal Pradesh. *Anthropologist*, 5(3): 193-195.
- Kumar, N. (1975). Blood group and secretor frequency among the Gallong. *Bulletin of the Department of Anthropology*, Dibrugarh University, 4: 5-70.
- Molnar, Stephen. (2002). *Human variation: Races, types and ethnic groups*. Upper Saddle River, NJ: Prentice-Hall.
- Mourant, A. E. (1959). Blood groups and anthropology. *British Medical Bulletin*, Volume 15, Issue 2: 140-144.
- Mourant, A. E. (1962) The Use in Anthropology of Blood Groups and other Genetical Characters. *The Journal of African History*, 3: 291-294.
- Raja K. A., Dobariya, G.H., Unagar, C.A., Pandya A.N., Patel, J.N., Wadhvani, S. J. (2016). Frequency and distribution of ABO and Rh blood groups among blood donors in tertiary care hospital of South Gujarat, India, *International Journal of Research in Medical Science*, 4: 5377-81.
- Reid, M.E., Lomas-Frances C, Martin Olsson. (1997). *The Blood Group Antigen Facts Book*. SanDiego, USA: Academic Press.

Tables

Table 1. Representation of ABO blood groups among students belonging to different tribes

Tribe	Blood Groups								Rh		Total
	O+ve	O-ve	A+ve	A-ve	B+ve	B-ve	AB+ve	AB-ve	Rh+ve	RH-ve	
Nyishi	154	3	114	2	75	1	29		372	6	378
Galo	35		16		23		7		81	0	81
Apatani	15		16		15		7		53	0	53
Tagin	17		15		13		5	1	50	1	55
Monpa	15		2		17		6		40	0	40
Adi	7		6		4	1	1		18	1	19
Nocte	4		3		1				8	0	8
Tangsa	3		2		1		1		7	0	7
Wangcho	3		1		2				6	0	6
Memba	1		1		2				4	0	4
Aka	3						1		4	0	4
Khamti					3				3	0	3
Mikir	1				1				2	0	2
Sartang							1		1	0	1
Miji					1				1	0	1
Mishmi	1								1	0	1
Singpho					1				1	0	1
Mising/Miri			1						1	0	1
Puroik			1						1	0	1
Sherdukhpen			1						1	0	1
Tutsa	1								1	0	1
Total	260	3	179	2	159	2	58	1	656	8	664

Table 2. Tabular demonstration of ABO blood group among students of five different tribes

Sl.No	Tribe	Total	O	O%	A	A%	B	B%	AB	AB%
	Nyishi	378	157	41.5%	116	30.7%	76	20.1%	29	8.6%
	Galo	81	35	43.2%	16	19.8%	23	28.4%	7	8.6%
	Apatani	53	15	28.3%	16	30.2%	15	28.3%	7	13.2%
	Tagin	51	17	33.3%	15	29.4%	13	25.5%	5	11.8%
	Monpa	40	15	37.5%	2	5%	17	42.5%	6	15%

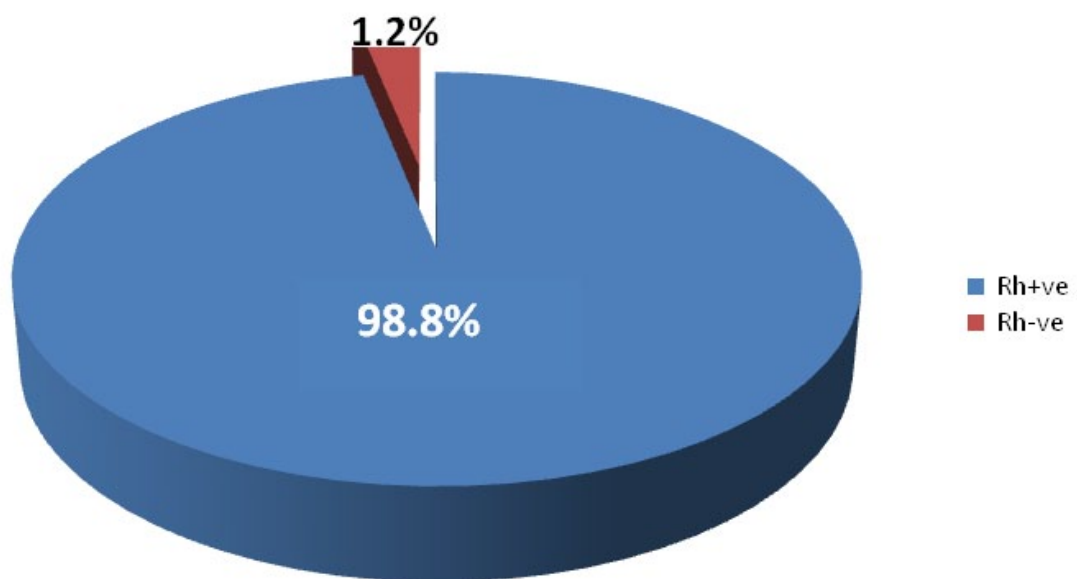
Table 3. Tabulation of antigen frequency distribution

Tribe	0%	A, B Antigen
<i>Nyishi</i>	41.5	58.5
<i>Galo</i>	43.2	56.8
<i>Apatani</i>	28.3	71.7
<i>Tagin</i>	33.3	66.7
<i>Monpa</i>	37.5	62.5

Figures

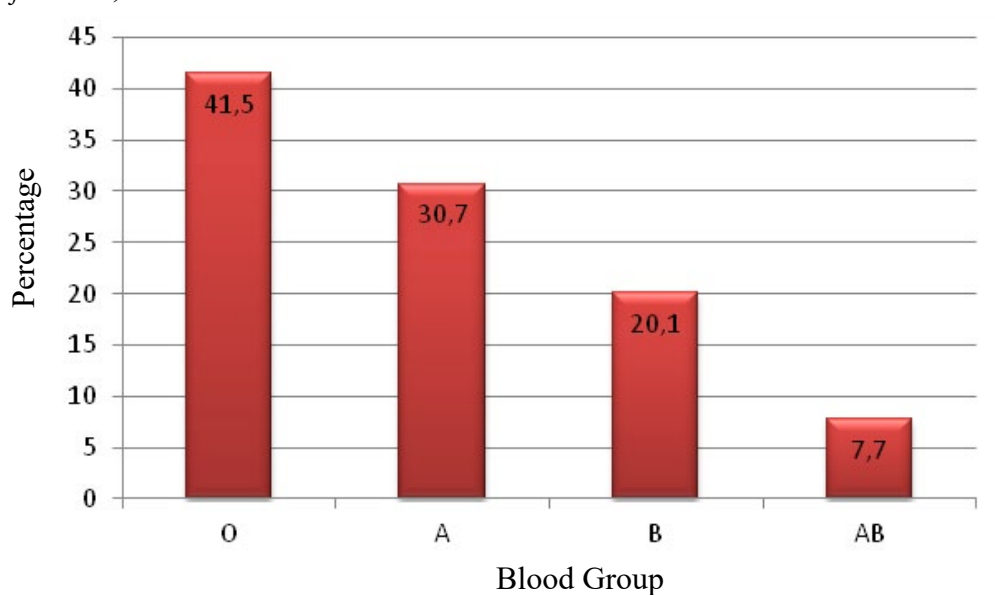
Fig 1: Pie Chart depicting the overall percentage of Rhesus factor distribution among students

Fig 2: Histogram depicting overall percentage of blood distribution among *Nyishi* students (in the table, we put full-stop instead



of a comma).

Fig 3: Histogram depicting overall percentage of blood distribution among *Galo* students (in the table, we put full-stop instead of a comma).



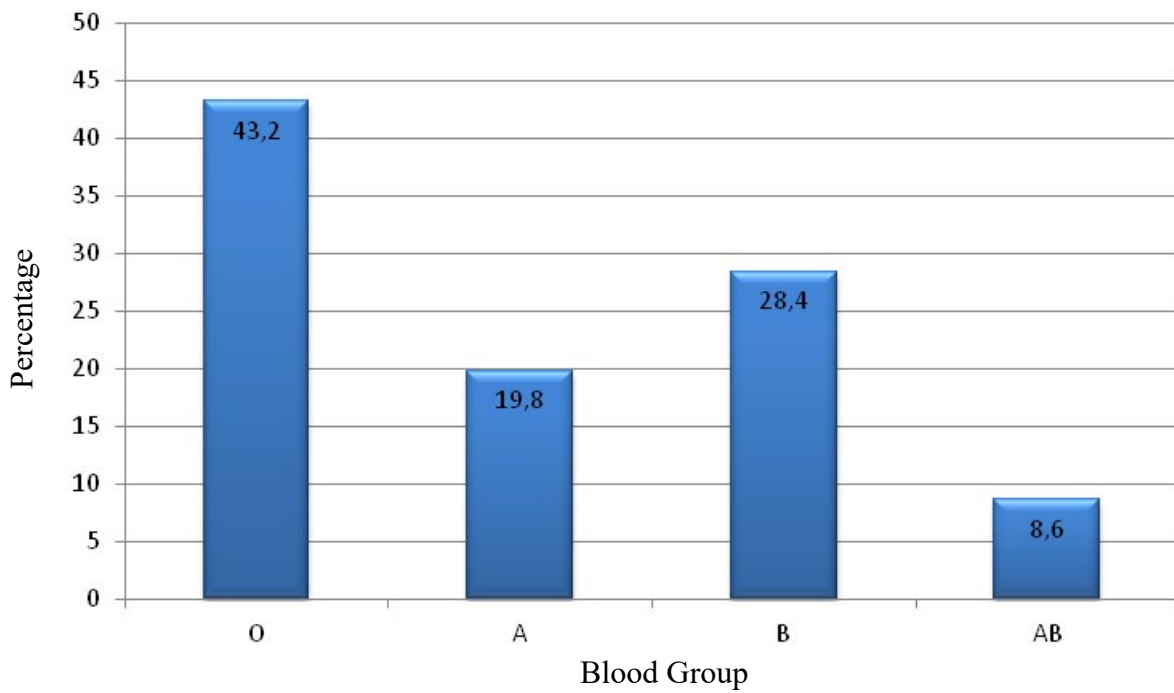


Fig 4: Histogram depicting overall percentage of blood distribution among Apatani students (in the table, we put full-stop instead of a comma).

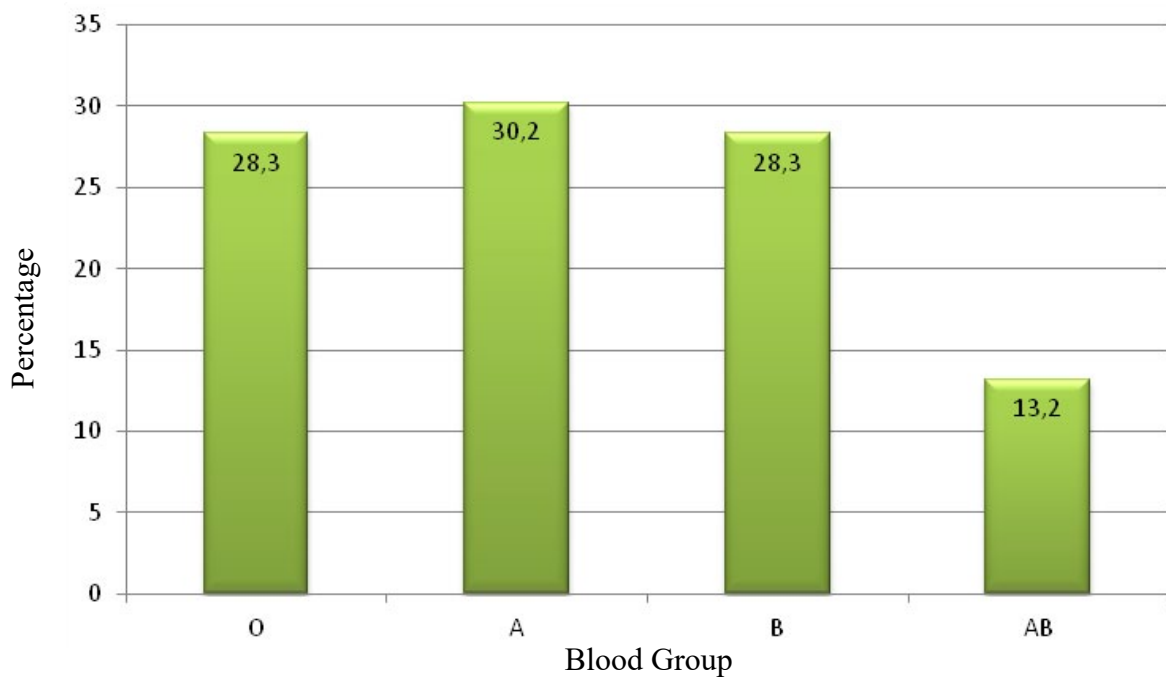


Fig 5: Histogram depicting overall percentage of blood distribution among Tagin students (in the table, we put full-stop instead of a comma).

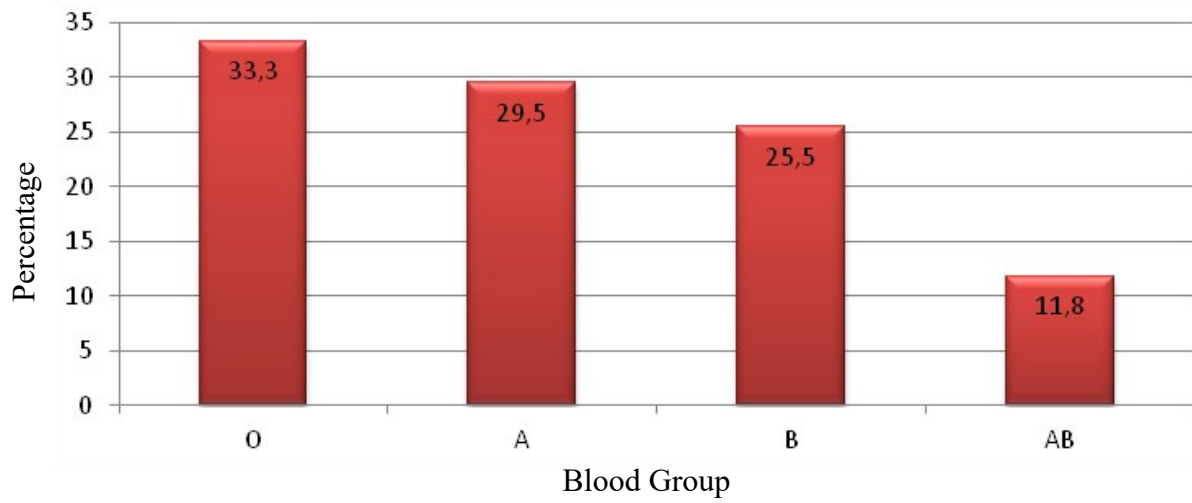


Fig 6: Histogram depicting overall percentage of blood distribution among Monpa students (in the table, we put full-stop instead of a comma).

