

Original Research

Comparison of distribution of ABO blood groups in population of migrant labourers from North and South India

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ABSTRACT:

Background: The aim of present study is to compare the distribution of ABO blood groups in population of migrant labourers from North and South India in Punjab. **Materials and method:** The total of 3500 migrant labourers from the North India and South India were randomly included in the study. Venous blood samples were collected from the subjects in the sterile vials containing an anticoagulant (EDTA) and blood groups were determined. **Results:** The blood group B is significantly more ($p < 0.05$) in North Indian subjects while the group O is significantly more ($p < 0.01$) in South Indian subjects. The other blood groups i.e. Group A, AB did not show any statistically significant result ($p > 0.05$). Distribution of ABO blood Groups in Males and Female of North and South Indians. The blood group O is significant ($p < 0.01$) in the female belonging to South India. **Conclusion:** North Indians had a greater frequency of blood group B whereas the South Indian had a greater frequency of blood group O.

Key words: ABO blood group, agglutinogens.

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INTRODUCTION

A person's blood group is one of his physical characteristics, just as dark skin, blue eyes or a hooked nose. Like other physical characteristics, blood groups can be used to divide mankind into races. The frequency of blood groups differ in different geographical areas but the geographical gradients of A and B genes give an indication that the blood groups are affected by environmental selection. Researchers have clearly demonstrated that the physiological genetics including blood groups are the product of interaction of biological and environmental factors.^[1] The blood groups are determined by the presence or absence of blood group antigens (agglutinogens) on the red blood cells and accordingly an individual's group is A, B, AB or O (O denotes the absence of A or B antigens).^[2] The

distribution of ABO and Rh (D) blood groups have been investigated in human populations all over the world during the last half century. It has become apparent that there is heterogeneity, not only between the continents and regions within them but also on a microscale among neighbouring countries and cities. The precision of such information is decisive if the causes of the heterogeneity-selective, migratory or random-are to be traced.^[3] The aim of present study is to compare the distribution of ABO blood groups in population of migrant labourers from North and South India in Punjab.

MATERIAL AND METHOD

Present study was conducted in Govt. Medical College/Rajindra Hospital, Patiala. The total of 3500

migrant labourers from the North India and South India were randomly included in the study. Venous blood samples were collected from the subjects in the sterile vials containing an anticoagulant (EDTA). These were stored at 2-8^oC upto maximum of 48 hours. Haemolyzed samples were discarded and the rest centrifuged at 1000-3000 rpm for 3 minutes. The method performed in the study was Tube Method at room temperature as had been standardized by Saran

and Makroo in 1991. It comprises of: Cell grouping or Forward grouping and Serum grouping or Reverse grouping. Antisera used are Anti-A, Anti-B, Anti-AB monoclonal antibodies manufactured by Mitra International. Materials used were-Reagent cells (A, B and O cells), Normal saline, Test Tubes 75x12 mm and Pasteur pipettes, Table top centrifuge, Microscope, Marker pen/pencil. Cell grouping was done afterwards.

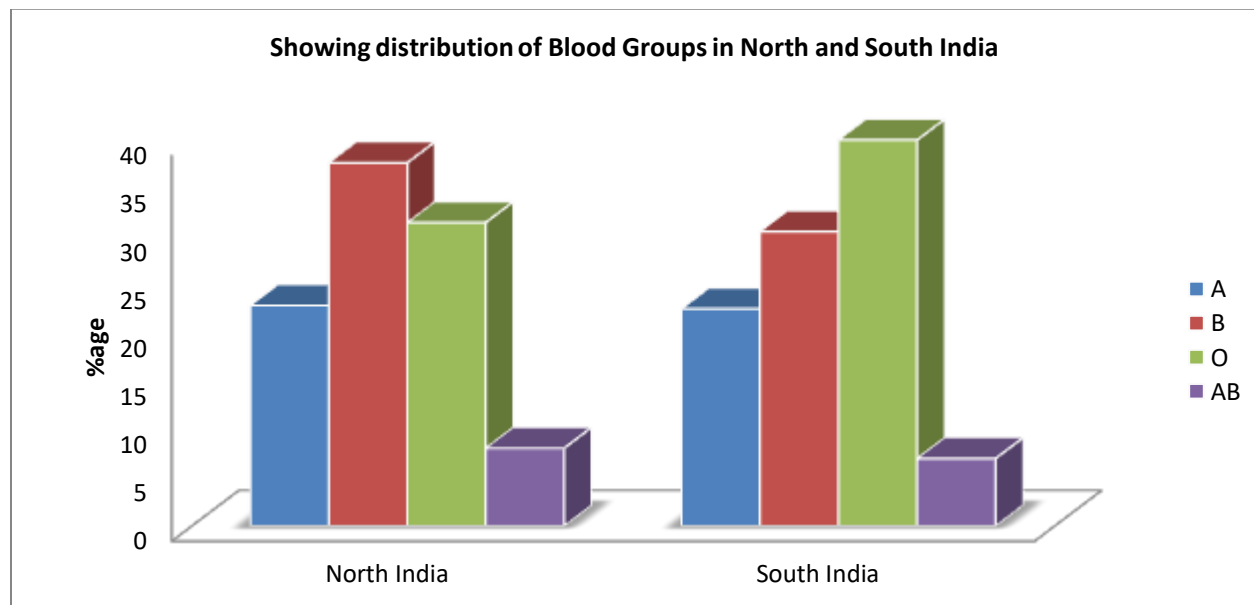
OBSERVATION AND RESULTS

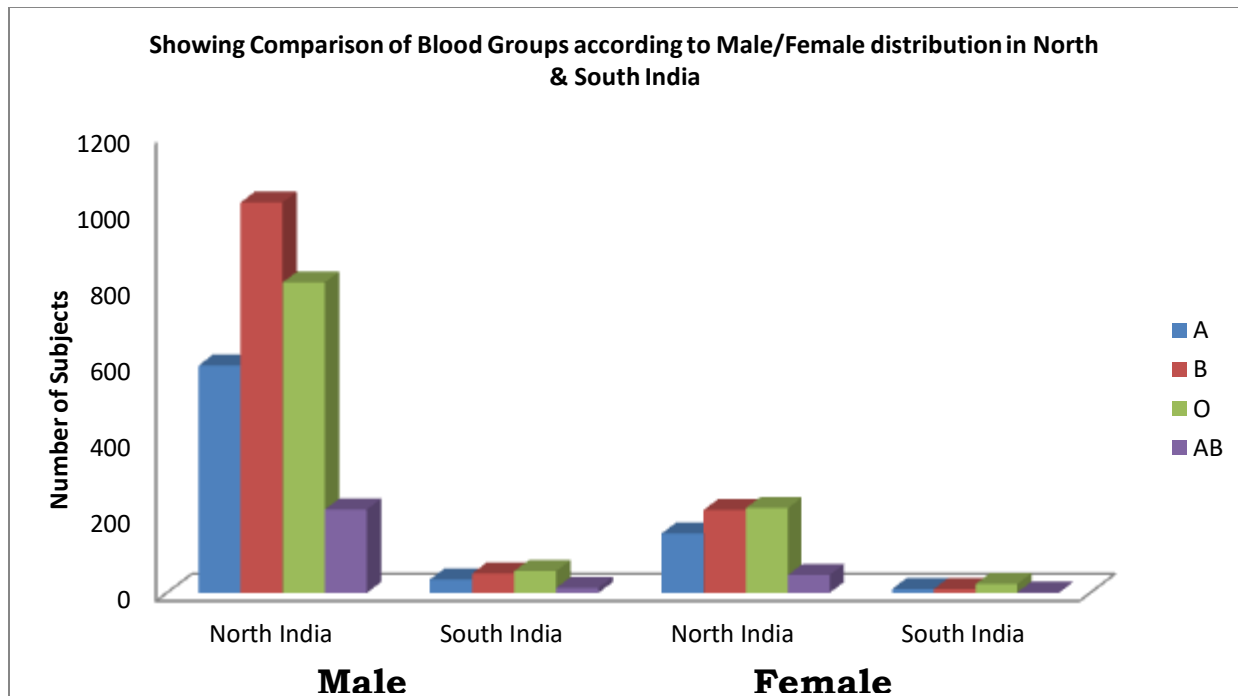
State	Blood Groups				Total Cases
	A	B	O	AB	
North India	754 (22.85%)	1242 (37.64%)	1038 (31.46%)	266 (8.06%)	3300 (94.28%)
South India	45 (22.5%)	61 (30.5%)	80 (40.0%)	14 (7.0%)	200 (5.72%)
Total	799 (22.83%)	1303 (37.23%)	1118 (31.94%)	280 (8%)	3500 (100%)

Table 1 - Distribution of blood groups in migrant labourer from North and South India

Sex	Part of Country	Blood Groups				Total Cases
		A	B	O	AB	
Male	North India	598	1024	815	219	2656
	South India	35	51	57	13	156
Female	North India	156	218	223	47	644
	South India	10	10	23	1	44

Table 2 - Comparison of blood groups according to male/female distribution in migrant labourer from North and South India





Comparison	χ^2	DF	p	Significance
A - North India vs South India	0.012	1	>0.05	NS
B - North India vs South India	4.109	1	<0.05	S
O-North India vs South India	6.334	1	<0.01	S
AB-North India vs South India	0.288	1	>0.05	NS

Table 3- Statistical Analysis of Distribution of ABO blood groups

The above table, on statistical analysis shows that the blood group B is significantly more ($p < 0.05$) in North Indian subjects while the group O is significantly more ($p < 0.01$) in South Indian subjects. The other blood groups i.e. Group A, AB did not show any statistically significant result ($p > 0.05$).

Comparison	Blood Group	χ^2	p	Significance
Male	A	0.0005	>0.05	NS
	B	2.144	>0.05	NS
	O	2.359	>0.05	NS
	AB	0.001	>0.05	NS
Female	A	0.05	>0.05	NS
	B	2.300	>0.05	NS
	O	5.582	<0.01	S
	AB	1.602	>0.05	NS

Table 4 – Statistical analysis of distribution of ABO blood Groups in Males and Female of North and South Indians
The above table on statistical analysis shows that the blood group O is significant ($p < 0.01$) in the female belonging to South India.

DISCUSSION

The human blood group system, first discovered in 1900 by Karl Landsteiner, has an immense importance in medicine, genetics, medical jurisprudence and anthropology. All human populations share the same blood systems but there exists racial and community differences in the frequencies of specific types. Out of these, 3300 subjects were from four North Indian States, population section from North India showed the dominance of blood group B.

The remaining population section ($n = 200$) was from South India comprising of 104 (2.97%) subjects dominant blood group in these was blood group O.

Authors	Regions	Year	No. of Cases	Blood Groups			
				A	B	O	AB
Pathak ^[4]	Punjab	1959	550	21.27	40.36	28.72	9.6
Mishra et al ^[5]	Western Orissa	1968	2988	20.1	38.6	40.21	1.1
Nayak et al ^[6]	Southern Orissa	1970	3529	16.74	35.05	45.37	2.88
Devi and Reddy ^[7]	A.P. (Kurnool)	1971	1586	21.55	33	42	4.7
Das and Thacker ^[8]	Orissa	1982	4129	20.6	33.2	40.7	5.5
Sunderraj et al ^[9]	Tamil Nadu (Coimbatore)	1986	30422	23.72	32.33	38.90	5.05
Roychoudhury et al ^[10]	Bihar and West Bengal	1992	219	28.77	33.33	18.72	19.18
Das et al ^[11]	South India (Tamil Nadu, Kerala, Karnataka)	2001	150536	26.10	32.53	20.88	20.49
Present study	North and South Indian migrant labourers	2003	3500	22.83	37.23	31.94	8

Table 3 - Several studies showing percentage incidence of ABO blood groups in different parts of India

Table clearly shows that the present study is comparable with other studies carried out earlier by various authors. They have also reported high prevalence of blood group B in Northern and Central Indian States and that of blood group O in Eastern and Southern States.

CONCLUSION

As is evident from the observations, the North Indians had a greater frequency of blood group B whereas the South Indian had a greater frequency of blood group O. This has also been proved by several workers in different parts of India. This finding was supported by observations made by some workers in the Hindu Kush region of Pakistan and Afghanistan and certain hilly region of U.P. Hence the similarity in the predominance of group A might be related to the similarity in the geographical condition. It is believed that the variations observed in different populations are due to both random processes and natural selection in the different environments. However since in the present study only representative populations are studied, this observation cannot be applied to the state as a whole.

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