

ASSESSMENT OF BLOOD GROUPS IN NEPALESE POPULATION

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Discovery of Blood Groups:—

Landois in 1875 discovered that red cells of an animal when mixed with the serum of another animal, clumping of red cells usually occurred. It was in 1900 that Landsteiner observed the agglutination of the human red cells by serum belonging to the same species, when he found that the sera of some of his colleagues agglutinated the red cells of others. Thus the ABO group was discovered which then explained clearly the serious reactions or death of the recipient when blood transfusion from one man to another was tried. In 1911 the sub-group of A was discovered by Van Dungern and Hirsxfeld. Landsteiner & Levin went on experimenting on the effect of injecting human red cells into animals and they were successful in discovering the MN system and the P system in 1927. These MN and P system do not influence blood transfusion but they are of genetic and anthropological interest. The methods involved in blood group detection were as follows:—

- i) Using the antibodies of human beings.
- ii) Using animal sera prepared by immunizing the animals with human red cells.
- iii) Injecting animal red cells into animals and then testing the antiserum against human red cells.

Landsteiner and Levin in 1940 discovered the RH blood group by injecting the red cells of the Rhesus Monkey into Rabbit and then tested the resulting serum against human red cells.

Levisohn introduced sodium citrate as an anticoagulant and then blood transfusion became more widely practised. Severe haemolytic reactions were reported inspite of using blood of same ABO group. Weiner & Peters in 1940 described 24 cases of haemolytic transfusion reactions not due to ABO incompatibility, and in investigation it was found that the RH blood group of the patient and the donor was different.

Levine & Stetson in 1939 had found an antibody in the serum of recently delivered woman whose foetus was dead in utero. It was then suggested that the stimulus was the

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foetus whose red cells immunised the mother, the foetus itself inherited the antigen from its father, which was foreign to the mother. Levin, Burnhan, Katzin and Vogel (1941) further developed the theory of isoimmunization in pregnancy as the cause of Haemolytic disease of the new born.

BLOOD GROUP	YEAR OF DISCOVERY
i) ABO	1900
A1, A2 Blood Group Subdivision	1911
ii) MN Blood Group	1927
MN Sa Subdivision	1947
iii) P Blood Group	"
iv) RH Blood Group	1940
v) Luntheran Blood Group	"
vi) Kell Blood Group	1946
vii) Lewis Blood Group	"
" Saliva Group	1954
viii) Sickliug (Negroes)	1957
ix) Duffy Blood Group	1950
x) Kid Blood Group	1961
xi) Diego Blood Group (Mongolians and American Indians)	1955
xii) Sutter Blood Groups (Negroes only)	1958
xiii) Auberger Blood Group	1951
xiv) Xg Blood Group	1962

Between 1963 and 1966 ABO and Rh blood group determination were done in 5000 Nepalese adult population age ranging 18—55 years, in Kathmandu valley by-using Human anti A, anti B and anti D antisera which were obtained from The-Lister Institute, London. Although this analysis was done only in a small number of population of Kathmandu valley since the population of Kathmandu valley represents a well mixed population of all types of Nepalese in the country-this would represent a fairly suitable sample for the whole country.

Method:-

There are different techniques for blood grouping e.g. the classical tube technique, the albumin replacement technique, the tube centrifuge technique, the slide technique and the chown capillary technique. Here the slide technique for ABO and the albumin replacement technique for Rh blood grouping were done.

THE SLIDE TECHNIQUE—

Two compartments were made in a clean slide by means of a grease pencil. In each compartment a drop of whole blood, obtained from a finger prick of a person, was mixed with a drop of anti A and a drop of anti B antisera (from Lister Institute). The slide was rocked gently manually and the result read with the naked eye within 5 minutes.

THE ALBUMIN REPLACEMENT TECHNIQUE—

One drop of two percent red cell suspension in normal saline was mixed with one drop of anti D antiserum (from The Lister Institute, London) in a precipitin tube. The mixture was incubated for 1½ hours at 37° C in an incubator. The tube was taken out of the incubator and the supernatant saline serum mixture was removed by means of a fine pipette, leaving the bottom of red cells. To this one volume of 20% bovine albumin was added and reincubated for half an hour at 37° C and the result read microscopically.

The following data was found—(in 5000), Group O—1495, Group A—1840, Group B—1180, Group AB—485, Rh positive—4593, Rh negative—407 (males—361, female—46). As Ph factor is more significant in females, so the sex has specially been mentioned in the table.

Thus the Nepalese Blood Group frequency was established as follows:—

GROUP	O—29. 9%
"	A—36. 3%
"	B—23. 6%
"	AB— 9. 7%
Rh Positive	—91. 86%
Rh Negative	—8. 14%

Comparison of ABO & Rh Blood Groups in different Nationalities.

Nationality	Author	ABO Blood Group in%				Rh Blood Group in%	
		O	A	B	AB	Rh Positive	Rh Negative
Nepalese		29.9	36.8	23.6	9.7	91.86	8.14
Americans	Mayre et al 1956, 638	45.8	38.7	10.8	3.7	85	15
English	Fisher & Taylor 1940, 257	48.6	40.34	8.54	2.52	84	15
Indians	Das Gupta Chatterjee 1954, 195	32.37	24.7	36.24	7.32		
Caucasians	Barak 78	43.1	33.1	19.8	4.53		
"	Mori 1931, 674	31.91	36.26	33.13	8.7		
Africans	Teixeira 1946, 636	48.4	23.35	24.55	3.5		

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