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BLOOD GROUPS IN IRAN

F. BRELIANJAHANSHAHI, M.D.

Introduction

There are already some data available on blood groups in Iran, Bowman and collaborators have carried out some blood studies concerning population genetics on Iranian population (1.2.3.4.5.). There are also the following statistical data obtained by the Imperial Army Medical Division in Teheran, on ABO, P and D systems (6).

The Army's statistics on 266,000 individuals has revealed:

A.	32.04 %	AB.	7.33 %
B.	23.21 %		
O.	37.42 %		

Also on 10,000 individuals taken at random, D negative has been calculated at 10.24 %.

Head of the Blood Transfusion Centre of Teheran University, Faculty of Medicine.

Red Lion and Sun's Blood Transfusion Centre's statistics of blood groups in Iran by Dr. Ajir shows somewhat different results. In this research which has been carried out over many years on individuals chosen at random, the following results have been obtained:

A. 33.4 %
B. 22.5 %
O. 36.6 %
AB. 6.5 %
D. neg. 7.36 %

The Blood Transfusion Center of Teheran University's Medical Centres has access to a large patient population (2,500 beds and 3,000 outpatient daily) presenting a cross section of the country.

A study of the blood groups of these individuals was therefore undertaken to elucidate this problem.

Materials and Methods

During the years 1341 — 1348 (seven years) a total of 69,328 blood samples were examines by the Blood Bank in Pahlavi Medical Centre. These samples came from hospitalized patients who were in need of a blood transfusion. Of these, 27,998 samples were duplicates from patients who needed repeat transfusions, giving a total number of 42,330 single specimens. Due to technical limitations, asampling method, based on a smaller number of random specimens was used for other blood studies than ABO system.

The M group was tested with anti N at 47°C and N group was tested with anti N at 37°C. Since agglutination of M containing erythrocytes may also occur in temperatures below 23°C.

The investigation was limited to the frequency of ABO/Rh./ MN Lewis, Duffy, Kidd, and Lutheran antigens. The rarer blood groups were not studied.

RESULTS

1. The ABO system

The breakdown of the ABO blood group system according to total number and percentages are as follows:

Group	Table 1	Percentage
O	16061	37.94 %
A	13037	30.8 %
B	7894	18.65 %
AB	5337	12.61 %

A survey of 500 saliva samples for substances demonstrated the presence of H substance in the saliva of 85 % of them. In these saliva samples A.B., AB, and no antigens were demonstrable in individuals with blood groups A.B., AB, and O respectively. No measurement of Lewis substance in saliva was undertaken.

The data pertaining to various substances and blood groups are presented in table 2.

Table 2

Substance in saliva	Percentage	Blood groups
A & H	26.1 %	A
B & H	19.4 %	B
H	34.3 %	O
A.B.H.	1 %	AB

2. The frequency of the Rh System

Rh typing with the D antigen on 42,330 individuals proved 47,074 of them to be negative, while 37,326 reacted positive i.e. 88.9 % positive and 11.1 % negative. The results of Rh typing with C,c,e, and E in another 200 individuals taken at random is presented in table 3.

Table 3

Rh Genotype	Percentage	No of sample
e	93 %	
c	74 %	
C	72 %	200
E	32 %	
d	20 %	
D	88.9 %	42,330

The above frequency of "d" in both homozygous and heterozygous conditions were estimated by a statistician.

3. The Frequency of M.M. blood group system

The frequency of M.M. blood group system in two hundred individuals tested at random for this system gave the following distribution:

Table 4

M.M.	32 %
MN	50 %
NN	18 %

4. The frequency of Lewis blood groups system

Direct examination was carried out for Le blood groups on 300 individuals 89 % were found to be positive and of these 72 % were Le a and remainder Le b. The frequency of this system was not measured in new born infants, but it was estimated to be lower than the adult population.

5. The frequency of Duffy blood grou0 system

The frequency of Fy was determined in 200 individuals by direct examinations with anty Fya and Fyb giving 68 % positives for Fya and 32 % for Fyb.

6. The frequency of Kidd blood group system

The frequency of JKa was measured in 100 blood samples. 75 % were found to be positive. The Jbb antigen was not tested due to lack of proper antigen.

7. The frequency of Lutheran blood group system

In 200 blood samples tested with anti Lua all of them were found to be Lua positive.

Since the result of all the blood examines in our department for ABO groupins and Rh typing, did not exactly match those of the Imperial Army or Red Lion and Sun's studies, we recently tried to further our study by checking on the origin of individuals and to prepare regional statistics.

With existing data it was possible to evaluate the birth place and approximate ancestral origin of 6370 persons and the resulting statistics obtained is shown in table 5.

Table 5

Approximate frequency of the genes A and D including AB group in different regions of Iran

Region	Groups			No of samples
	A	B	D neg.	
Azarbaijan	34.2 %	14.5 %	11.5 %	2,000
East of Iran				
Kermanshah	42.3 %	17.2 %	7.3 %	1,500
Luristan				
Kurdistan				
Caspian Area	32.5 %	24.3 %	12 %	2,000
Khorassan	26.3 %	25.7 %	12.8 %	500
Persian Gulf	22.4 %	30.3 %	15.2 %	370
Area				

Summary and Conclusions

The above investigation represents one of the few studies carried out in the field of population genetics in Iran.

The differences in all three groups of studies which have been carried out by Blood Transfusion Centres of the Imperial Army, Red Lion and Sun and Teheran University, inspired us to carry out further investigations on ABO blood grouping and Rh typing in order to obtain the result on table 5.

These statistics may not be an absolute pattern for genetic markers in Iran's different population, but it certainly gives an indication that such differences exist. Since the study of genetics in any population is assisted by genetic markers of different components of the blood, it is hoped that this data will serve to stimulate other investigations involving larger studies in this important field.

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