ABO BLOOD GROUPS AND BIRTH WEIGHT

by

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SUMMARY

Aird et al (1954), Dolge (1967) and Hurkat et al (1970-72) brought out, with varying degrees of certainty, a relationship between the ABO blood groups and different diseases. This raises an interesting question of whether the blood groups also have any correlation with the normal physiologic parameters of an individual. Selecting birth weight as one such parameter the authors investigated its possible relationship with ABO blood groups vis-a-vis other reports on the subject.

Seven hundred and seventy-nine live-born infants, consequitive deliveries in the Maternity Hospital of Ajmer, were taken for this study, irrespective of their gestational maturity.

Of the 779 infants, 532 (68.3%) had the same blood group as their mothers, while the blood groups of remaining 247 (31.7%) was different. However, there was no satistically significant difference in the birth weight of the infants belonging to the two groups.

It is, however, interesting to observe that in Indian population, group AB is the rarest (5.7 per cent in this sample) and here again the authors found that the birth weight of group AB infants tends to be the lowest (Table II). A statistically significant difference was observed between the birth weight of group AB infants as compared with others. In particular, group AB and O, with mean weights of 2706 g and 2790 g, respectively, differed sufficiently to suggest that blood groups may have some influence on birth weight.

Material and Methods

Cord blood was collected from each infant for typing immediately after birth and the infant was then carefully weighed. The mother's blood was taken for grouping at any convenient time.

The method used for blood group determination consisted essentially of preparing a red cell suspension in normal saline and treating it with commercially available high titre anti-A and anti-B sera in precipitation tubes as described by Darmady and Devenport (1963). Agglutination was checked under the microscope.

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Results

The frequency of distribution of different blood groups among the 1558 individuals examined (779 infants and 779 mothers) is shown in Table I. This confirmed closely to the general trend among Indians (Hurkat *et al* 1972) with groups B and O predominating and group AB being relatively rare.

Of these 779, the weights of 222 of these infants were below 2,500 g, these infants were therefore, premature by the international standard. However, the authors treated birth weight as one continuous variable and made no attempt to separate premature infants from fullterm ones for the purpose of analysing the overall relationship between blood groups and birth weight.

Tables II and III show the birth weight of infants belonging to each blood group separately and percentage-wise respectively. Group 0 shows the highest mean birth weight, while group AB has lowest birth weight. This observation is in consonance of Kothari *et al* (1969).

To find out whether these observed differences were statistically significant students 't' test was applied between every two blood groups, the 4 groups in all the 6 possible combination of 2 each. The analysis shows that birth weight of AB infants was significantly different from O blood group infants. The t value for groups A and AB, B and AB and O and AB were 0.51 ($P > 0.5$), 0.6 ($P > 0.5$) and 1.3 ($P < 0.1$). No significant difference in birth weights had been found among other blood groups, viz., between A and B, A and O, A and AB and B and AB and B and O groups.

TABLE I

Percentage Frequency of ABO Blood Group in 779 Newborn Infants and Their Mothers

	Blood groups			
	A	B	AB	O
Mothers	23.7	34.8	5.5	36.0
Infants	22.7	35.3	5.8	36.2
Total	23.2	35.05	5.65	36.1

TABLE II

Birth Weight of 779 Newborn Infants According to Their Blood Groups

Blood group	Number	Birth weight (grams)		
		Mean	Standard deviation	Standard Error
A	185	2740	443	39
B	272	2742	461	28
AB	43	2706	350	54
O	279	2790	492	30
	779	2736	470	18.0

TABLE III
Distribution of ABO Blood Groups in 779 Newborn Infants

Birth Weight (Grams)	Blood Groups									
	A		B		AB		0		Total	
	N	%	N	%	N	%	N	%	N	%
0-999	1	0.5	0	0	0	0	0	0	1	0.1
1000-1999	3	1.6	17	6.2	2	4.7	11	3.9	33	4.2
2000-2249	11	5.9	16	5.8	1	2.3	17	6.1	45	5.8
2250-2499	35	18.9	47	17.9	7	16.3	54	19.3	143	18.3
2500-2999	89	48.1	103	37.6	20	46.5	108	38.4	320	41.1
3000 +	46	24.9	89	32.6	13	30.2	89	32.3	237	30.4
Total	185	100	272	100	43	100	279	100	779	100

Discussion

Plotkin (1958) reported that there is a greater incidence of prematurity and still birth among group B infants as compared with other blood groups. By this finding he tries to explain why group B is relatively infrequent in the western world. However, a much larger sample will have to be analyzed to establish the conclusion, and the present work is one such step in line for cumulative analysis.

Boettcher and Hay (1968) suggested that ABO incompability may be responsible for infertility in some women and the authors tried to establish if a dissimilarity between the blood groups of the mother and infant might also influence the birth weight. However, the 506 infants who had the same blood group as their mothers did not differ significantly with reference to their birth weight from the 235 others in which the blood groups were dissimilar. It does not appear that a dissimilarity in the blood groups of the mother and infants, as far as the ABO system is concerned, adversely affect the birth weight.

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