

CORRELATION OF BLOOD GROUPS WITH CONGENITAL DISORDERS AND GASTRO INTESTINAL DISEASES

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Summary : Blood group studies were conducted in 330 patients suffering from gastro intestinal disorders and 180 patients with congenital malformations and compared with normal subjects. Statistical analysis has shown that (a) there is significant correlation between B group and thalassaemia, (b) congenital malformations show higher incidence in B and O groups. It would be pertinent to draw attention to the fact that B group was found to be significantly correlated to duodenal ulcer from the present study contrary to the early reports. In addition, these observations show that blood groups are linked with disease.

Key words : blood groups B and O
duodenal ulcer

thalassaemia

congenital
malformations

INTRODUCTION

Aird *et al.* (1) reported for the first time the correlation between blood groups and diseases. The present work was undertaken to study the correlation between blood groups and certain diseases as they occur in our country today. The ultimate aim is to determine rational causes for such a correlation and arrive at measures for prevention of the diseases.

Aird *et al.* (2) established the correlation between carcinoma of colon and rectum and peptic ulcer with blood group O. This substantiated the earlier views of Buchanan *et al.* (4) and Ugelli (16). Mourant *et al.* (11) reported that congenital pyloric stenosis showed significant correlation with A and B groups. Many other scientists like Dunsford and Barber (3), Johnson (9) and Race and Sanger (15) have expressed the view that blood groups are correlated to certain disorders. These associations may be just due to specific substances.

MATERIAL AND METHOD

Blood samples were collected from 330 patients suffering from gastro intestinal disorders and 180 patients with congenital malformations. Using the standard procedure

(Slide method) the blood groups were identified. This was compared with the blood groups of 262 normal persons (control population). The selection of control population was based on Aird *et al.* (1) specifications, over 75% of data was drawn from the register of blood donors. Rest of the sample was drawn from healthy people and persons suffering from other diseases. Statistical analysis of the data was done using the method adopted by Woolf (17).

RESULTS

Tables I and II indicate the blood group ratios in relation to various disorders which have been analysed and compared with controls. It was found that congenital malformations as a whole show significant correlation to B and O groups with chi-square (χ^2) value of 4.2298 and relative incidence (X) of 0.5710 for A:O ratio and χ^2 of 0.2795 for B:O ratio. Thalassaemia showed significant correlation to B group. Other congenital malformations show no significant correlation to any group.

Duodenal ulcer has a high incidence in B group with a significance value of 3.998 and relative incidence of 1.927 for B:O ratio.

TABLE I : Related to A and O groups.

Diseases	Blood groups				A:O Ratio	Relative incidence X	Significance χ^2
	A	B	O	AB			
1. Cong. blood disorders	23	29	29	4	0.9539	1.202	0.3232
2. Thalassaemia	10	22	6	0	1.667	2.527	2.9287
3. Cong. G.I. disorders	8	12	18	4	0.4444	0.6753	0.7434
4. Other Cong. disorders	3	21	25	6	0.1200	0.1445	9.3537
5. Cong. disorders as a whole	29	61	77	13	0.3766	0.5710	4.2298
6. Duodenal ulcer	19	31	18	6	1.055	1.272	0.4289
7. Total peptic ulcer	14	31	36	2	0.3889	0.5895	2.2171
8. Carcinoma of stomach	16	17	13	3	1.231	1.482	0.9312
9. Gastritis/Enteritis	3	7	16	1	0.1875	1.0552	0.007207
10. Diarrhoea/Dysentery	7	10	9	7	0.7777	1.179	0.09714
11. G.I. Disorder	76	117	117	20	0.6495	0.9970	0.000182
Control	62	84	94	24	0.6597	(Compared with each of the diseases 1 to 11)	

TABLE II : B and O groups related.

Diseases	Blood groups				B:O ratio	Relative Incidence X	Significance χ^2
	A	B	O	AB			
1. Cong. blood disorders	23	29	29	4	1.0000	1.119	0.1229
2. Thalassaemia	10	22	6	0	3.667	4.103	8.4928
3. Cong. G.I. disorders	8	12	18	4	0.6666	0.7459	0.5324
4. Other Cong. disorders	3	21	25	6	0.8026	0.9036	0.0933
5. Cong. malformations as a whole	29	61	77	13	0.7927	0.8865	0.2795
6. Duodenal ulcer	19	31	18	6	1.7222	1.927	3.9908
7. Total peptic ulcer	14	31	36	2	0.8612	0.9636	0.01664
8. Carcinoma of stomach	16	17	13	3	1.039	1.162	0.1424
9. Gastritis/Enteritis	3	7	16	1	0.4375	1.179	0.1111
10. Diarrhoeal/Dysentery	7	10	9	1	1.1111	1.243	0.1945
11. G.I. disorders as a whole	76	117	117	20	1.0000	1.119	0.3185
Control	62	84	94	24	0.8937		

(Compared with each of the disease 1 to 11)

DISCUSSION

Aird *et al.* (1) and Clarke (5) established the correlation between carcinoma of stomach, colon, rectum and peptic ulcer with blood group O. In 1959, Clarke *et al.* (6) found that 75% of the people were ABH secretors in O group and the others were non-secretors. Whether a person is a secretor or not is determined by a pair of genes at a chromosomal locus independent of that which determined the ABO blood groups. The ABH and Le substances which are found increased in secretor and non-secretors respectively may be responsible for the relatively high incidence of duodenal ulcer in O group non-secretors than secretors as reported by Evans (7). Clark *et al.* (6) have stated that O group non-secretors were 2.49 times more prone to get duodenal ulcer than O group secretors and that AB group non-secretors were 1160 times more prone than A, B and AB group secretors. However, they found no correlation between blood groups and gastric ulcer. So they have concluded that O group and the non-secretor status of individual had an additive effect on the duodenum. According to them, Aird (2) believed that blood group specific substances which were secreted might offer protection against the ulcerogenic agent which was indicated by the salivary fucose content.

The exact mode of protection whether it be mechanical, immunological or chemical had not as yet been revealed. An increased amount of blood group specific substances in stomach had been reported by Dunsford and Barber (3) in patients suffering from carcinoma of stomach. They called the stomach as the "richest source of blood group specific substances in the body". The amount of blood group specific substances was ten times the amount of the same in erythrocytes.

For each disease, efforts have been made to determine whether there was any significant correlation with any of the blood groups A, B and O. It has been stated that a value of 3.841 for significance χ^2 would be equivalent to the probability of one false case of apparent association turning up in every twenty cases. In the following discussion also, this standard had been kept in mind in assessing correlation.

In the present study duodenal ulcer had a high level of incidence in B group with a significance value of 3.9908 and a relative incidence of 1.927 for B:O ratio. In the review of earlier literature (8, 10, 12) duodenal ulcer and O group have been correlated by Race and Ruth Sanger (15) which had been later contradicted by Papayannopoulos (13) who stated that it was spread among all groups. The present finding did not confirm with any of the two findings reported above. Quang *et al.* (14) reported a statistically verified preponderance of blood group B in his 750 patients of peptic ulcer. Carcinoma of stomach showed no significant level of occurrence in any group. Aird *et al.* (1) associated group A with carcinoma of stomach. But such a correlation could not be established from the results of the present work.

No correlation of any significant value was found between common gastro intestinal disorders (like gastritis, enteritis, dysentery and diarrhoea) and any blood groups.

There are a few or not enough published reports with regard to the A B O distribution in congenital disorders and a comparative analysis therefore is not possible. Congenital disorders related to blood or blood dyscrasias other than thalassaemia have shown hardly any correlation with the blood groups in the data analysed.

An association was however found between blood group B and Thalassaemia. Thalassaemia, when considered as a separate entity gave a high value of 8.4928 for significance (χ^2) in B:O ratio thus revealing a high incidence of the disease in B group persons and the correlation was very significant.

Congenital gastro intestinal disorders, selected from Stanley Hospital, Madras showed no significant level of incidence in any of the blood groups. In the other congenital disorders χ^2 for A:O ratio was 9.5537, with a relative incidence of 0.1445. Since

X was less than one, a high incidence of the disease in O group was indicated. The significance (χ^2) value for B:O ratio was seen to be 0.0933 which would mean an equal incidence of the disease in B and O groups in the disease. Since O group is already shown to have a significant correlation with the disease (as in A:O ratio), it may be concluded that B group has the same high correlation.

All types of congenital disorders when considered as one entity show a significant correlation with B and O groups. (since $\chi^2=4.2298$ and $X=0.5710$ for A:O ratio and $\chi^2=0.2795$ for B:O ratio) as shown by the significance values.

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