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Original Article

Association Between Diabetes Mellitus and Secretor (ABH) Status

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Abstract

Five hundred and seventy seven patients with diabetes mellitus showed ABO blood group frequencies closely similar those expected from the controls. Four hundred and eleven patients with diabetes mellitus showed frequencies of secretion and non-secretion of the ABH (O) substances in the saliva closely similar to those expected from the controls. three hundred and two patients with diabetes mellitus gave MN blood groups frequencies very similar to those expected from the controls.

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Introduction

There are certain diseases which show strong evidence of association with the ABO blood groups, notably duodenal ulcer with blood group O and carcinoma of stomach with the blood group A. However, examination of the literature produces conflicting results with regard to diabetes mellitus.

Results of a combined series from Lancashire, Cheshire, and Oxford showed a significant excess of blood group A among male diabetics[1]. On the other hand, in Copenhagen an excess of blood group O was found in male diabetics[2]. Results from Italy and Trinidad both showed increased frequencies of blood group B among diabetics[3,4], but in Germany and in Glasgow no significant difference was found between controls and patients with diabetes[5,6].

Recent evidence of the relation ship between secretor status and diabetes mellitus came in a paper by Doli, Drane and Newel in which after examining the saliva of 102 diabetics, they conclude that the occurrence of diabetes mellitus was independent of the ABH (O) secretion[7].

Many of these workers have also studied the Rhesus and MN blood group system but no association have appeared.

The present investigation was therefore carried out in the light of these rather conflicting findings.

Material

The data was derived from Five hundred and seventy seven patients attending the diabetic out patient clinic of the Diabetic Hospital, Rajshahi. There was two hundred and twenty nine men and three hundred and forty eight women. All patients in these series had fully established diabetes mellitus; all patients were under treatment for the diabetes.

Controls

In order to compare the ABO, MN and secretor status of the patients with suitable control. It was necessary for the patients and control to be drawn from the same population. The ABO blood group distributions were in fact known for a large series Seven thousands five hundred and fifty one of current blood donors normally resident in Rajshahi

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City, Bangladesh, consequently the patients studied were those normally resident in that area.

The MN blood group distribution for the population was not known and was there fore estimated in One hundred and thirty five people normally resident in Rajshahi City, Bangladesh. The medical and technical staff at the Rajshahi city, Diabetic Hospital, Laboratories and patients attending out-patients clinic at that centre for the first time made up the control series for this blood group distribution.

The distribution of the secretor status in the population was also not known and was therefore estimated in two independent series of persons normally resident in Rajshahi City. The first was composed of 182 doctors, technicians and staff at the Diabetic Hospital, Rajshahi, and patients attending the out patients clinic of that Hospital. The second series consisted of 135 doctors, technicians and staff at the BPI Hospital, Rajshahi City, and blood donors attending for the first time at the Quantum foundation, Rajshahi. The two series were combined because there was no statistically significant difference (at P= 0.05) between the two distributions (Table I), and were used in the subsequent analysis.

Table-I: Distribution Of Secretor Status In 317 Controls By Individual Series

Secretor Status	Number of Controls		
	First Series	Second Series	Combined Series
Secretor	115 (63.19)[1]	89 (65.93)	204 (64.35)
Non-secretor	67 (36.81)	46 (34.07)	113 (35.65)
Total	182 (100.00)	135 (100.00)	317 (100.00)

[1] Percentage secretor status distribution for each series

$\chi^2 = 0.562$ d. f = 1, 0.50 > P > 0.30

Methods

A sample of blood was collected by venepuncture at the routine weekly diabetic clinic. The sample was divided, one for blood sugar estimation and the other for blood grouping. For blood grouping the sample was allowed to clot in a clean dry 2ml tube and stored over night at 4^0C and tested the following day. The plate method was used for typing the ABO blood groups and the tube method was used in the estimation of the MN genotypes.

As the blood sample was being taken, the nature of investigation was explained to the patient and a request made for a sample of saliva. The saliva was collected in a mono container and the sample was then decanted in to a small 2ml boiling tube. The tube was closed with nonabsorbent cotton wool and placed in a boiling water bath for at least 10 minutes. The boiled saliva was stored overnight in a freezing chamber at least at less than -4^0C and tested the following day by an inhibition agglutination reaction.

All the tested were carried out with the assistance of the chief technician in the laboratories of the BPI Hospital (Govt. Registered), All test was done with the commercially prepared slandered reagent. The χ^2 test was used to estimate the probability of differences between distributions occurring by chance and probability of less than P= 0.05, as is conventional indicate significant difference.

Results

ABO BLOOD GROUPS: In this series 577 patients with diabetes mellitus were examined in reaction to the ABO blood group distribution. In Table- II, the ABO distribution of patients is compared with that expected from the 7,551 controls. There was no significant difference between the observed and expected distributions.

When the data were subdivided by age of onset of the disease, sex, and family history similar results were obtained in all subgroups.

Table-II: Distribution Of 577 Patients With Diabetes Mellitus By Abo Blood Group Compaired With Expected Distribution In Controls

Blood group	Patients	Control (%)
	Total No	
A	138 (23.92%)	1694 (22.44%)
B	202 (35.01%)	2657 (35.19%)
O	190 (32.92%)	2565 (33.97%)
AB	47 (8.15%)	634 (8.40%)
Total	577 (100.00%)	7551 (100.00%)

$\chi^2 = 4.379$ d.f = 3, 0.30 > P > 0.20

MN BLOOD GROUPS: In this series 302 patients with diabetes mellitus were examined in relation to the MN blood group distribution. In Table III it will be seen that there was no significant difference between the MN distribution of the patients and the appropriate controls.

When the data were subdivided by age of the onset, sex and family history similar results were obtained in all subgroups.

Table-III: Distribution Of 302 Patients With Diabetes Mellitus By Mn Blood Group Compaired With Corrosponding Distribution In 135 Controls

Blood group	Patients	Control
	Number	Number
M	205 (67.88%)	93 (68.89%)
N	42 (13.91%)	17 (12.59%)
MN	55 (18.21%)	25 (18.52%)
Total	302 (100.00%)	135 (100%)

χ^2 = 0.033d.f = 2, 0.99 > P > 0.98

SECRETOR STATUS: In this series 616 patients with diabetes mellitus were examined in relation to secretion of the ABH (O) blood group substance in the saliva. In Table IV the secretor status distribution of the patients is compared with that of the controls and there was no significant difference between the two distributions.

Again, when the data were subdivided by age of the onset, sex and family history similar results were obtained in all subgroups.

Table-IV: Distribution Of 411 Patients With Diabetes Mellitus By Secretor Status Compaired With Corrosponding Distribution In 317 Controls

Secretor Status	Patients	Control
	Number	Number
Secretor	258 (62.77%)	205 (64.67%)
Non-secretor	153 (37.23%)	112 (35.33%)
Total	411 (100.00%)	317 (100.00%

χ^2 = 0.295 d.f = 1, 0.70 > P > 0.50

Discussion

In order to combine and compare these data with those of the literature the method devised by Woolf [8] was used. Many investigators have made estimates which suggest that the incidence of diabetes mellitus is relatively greater among persons of group- A than among those of group-O, few however have found this relative excess to the significant in Table- V.

Table V: Relative Incidence Of Diabetes Mellitus In Persons Of Group- A Compared With Incidence In Person Of Group-O

Sl. No	Center	Total No of Patients	Relative Incidence A: O	χ^2	P
1	S.W Lancashire[1]	634	1.12	1.60	0.30>P>0.20
2	W. Cheshire[1]	199	119	1.18	0.30>P>0.20
3	Oxford[1]	500	1.11	1.13	0.30>P>0.20
4	Glasgow[6]	817	1.18	4.12	0.05>P>0.02
5	Copenhagen[2]	992	0.83	7.31	0.01>P>0.001
6	Germany[5]	1300	1.07	1.02	0.50>P>0.30
7	Trinidad[4]	355	1.12	0.51	0.70>P>0.50
8	Modena[3]	436	1.28	4.47	0.05>P>0.02
9	Rajshahi, Bangladesh	577	0.91	1.50	0.30>P>0.20

Mean weighted relative incidence 1.05

χ^2				
	Total		22.84	
	Difference from unity	d.f =1	1.35	0.30>P>0.20
	Heterogeneity	d.f = 8	21.49	0.02>P>0.01

The significant findings are conflicting in Glasgow and Modena the estimated incidence of diabetes mellitus in person of blood group- A is significantly greater than in those of blood group-O, but in Copenhagen the estimated incidence in persons of blood group- O is significantly greater than those of blood group- A. There is evidence of significant heterogeneity between areas and for this reason the data from different areas can not be pooled. The results are still conflicting and the present series tends to add to this conflict.

This investigation is the third in which the MN blood group distribution has been examined in diabetes mellitus; 3139 patients were examined in Oxford[1], Iowa[10], and Belfast, and in all centers the MN distribution of the patients closely resembled the MN distribution of the controls.

The investigation is the second in which the secretor status has been examined and it supports

the finding of Doll et.al[7]. Who concluded that the occurrence of diabetes mellitus was independent of the ABH (O) secretion.

It is appreciated that these results are based on essentially factual observations but epidemiological studies of this kind are, in the wards of Aird and Roberts[11] 'the beginning not the end of research, they direct attention to what might profitably be looked for'.

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Conclusion

Iron sucrose complex has been able to raise the haemoglobin to satisfactory level when used in anaemia in iron deficient pregnant women. It is safe and well tolerated.

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