

ASSOCIATION OF ABO BLOOD GROUPS WITH TYPE 2 DIABETES MELLITUSB. V. Sudheer¹, Y. Sivaramakrishna²**HOW TO CITE THIS ARTICLE:**

B. V. Sudheer, Y. Sivaramakrishna. "Association of ABO Blood Groups with Type 2 Diabetes Mellitus". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 28, April 06; Page: 4850-4854, DOI: 10.14260/jemds/2015/703

ABSTRACT: There are no confirmatory studies have been available in India to know the Association of ABO blood groups with Type 2 Diabetes mellitus. We studied ABO blood groups association with Gender and age of onset of Type 2 Diabetes Mellitus. The study results showing that Blood Group O followed by B and A showing the positive association with Type2 Diabetes mellitus. In Males Blood group O (20%) followed by B (16.9%) and A and AB. In Females Blood group O (22.85%) followed by A group (11.42%) and B and AB having association with Type2 Diabetes mellitus. The association as per age of onset of Type 2 DM with ABO blood Groups showing that the age of onset of Type2 DM in 41-50 yrs (34.28%). It is commonly associated with Blood group O (18.09%), and in the age of onset of Type 2 DM in 30-40yrs (33.33%) is commonly associated with blood group O and B (10.47%) equally and in 51-60yrs (26.66%) with with blood group O (11.42%) and in the age of onset of DM above 60yrs (5.71%) with blood group O (2.85%). **PATIENTS AND METHODOLOGY:** It was a prospective study conducted in 105 patients with Type 2 Diabetes mellitus. Prior consent taken from the study subjects to obtain the information about age of completed years, gender, age of onset of Diabetes and family history of known Diabetes. The age of onset of Diabetes above 30yrs were taken for study. Exclusion criteria were patients with Psychiatric illness, acute illness, age less than 30yrs old and history of diabetic ketoacidosis. Blood samples were collected from them with consent. The samples were tested for ABO blood groups. The Control samples are randomly selected. Patient recruitment lasted for 1 month from 1.1.2015 to 31.1.2015.

KEYWORDS: Type 2 Diabetes mellitus, Blood Group A, Blood Group B, Blood Group O, Blood Group AB.

INTRODUCTION: RESULTS:

Blood Groups	Number of Patients	Percentage %
A	26	24.76%
B	28	26.66%
AB	6	5.71%
O	45	42.85%
TOTAL	105	

Table 1: Blood groups % distribution in patients with Type 2 Diabetes Mellitus

Blood group O (42.85%) is the commonest blood group, followed by group B (26.66%), A (24.76%) and AB (5.71%) associated with Type 2 DM.

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Blood Groups	Number of Control Samples	Percentage %
A	24	37.5%
B	12	18.75%
AB	2	3.12%
O	26	40.62%
Total	64	

Table 2: ABO blood groups among the Healthy control

Blood group O (40.62%) is the commonest blood group, followed by group A (37.5%), B (18.75%) and AB (3.12%) in healthy control group.

Control					Patients				
Blood group	Male	%	Female	%	Blood group	Male	%	Female	%
A	8	12.4%	16	25%	A	14	13.33%	12	11.42%
B	6	9.34%	6	9.37%	B	17	16.19%	11	10.47%
AB	2	3.12%	0	0%	AB	4	3.80%	2	1.9%
O	19	29.68%	10	15.62%	O	21	20%	24	22.85%
Total	32		32		TOTAL	56		49	

Table 3: Distribution Of Blood Groups Between Genders For Both Controls And Patients

In control group in Males Blood group O (29.68%) is the common group followed by Blood group A (12.4%) and blood group B and AB and in Females Blood group A (25%) is common followed by blood group O (15.62%) and B. whereas in the study group in Males Blood group O (20%) followed by B (16.9%) and A and AB. In Females Blood group O (22.85%) followed by A group (11.42%) and B and AB are associated with DM.

Blood Gr.	30-40 yrs		41-50 yrs		51-60 yrs		>60 yrs	
		%		%		%		%
A	12	11.4	7	6.66	6	5.71	1	0.95
B	11	10.47	10	9.52	6	5.71	1	0.95
AB	1	0.95	0	0	4	3.8	1	0.95
O	11	10.47	19	18.09	12	11.42	3	2.85
Total	35	33.33	36	34.28	28	26.66	6	5.71

Table 4: Distributions of ABO Blood groups in Type 2 DM as per the onset of Age

The onset of Type 2 DM in the age group of 41-50yrs (34.28%) is common followed by 30-40yrs, 51-60yrs and above 60yrs. Among the 41-50yrs the Blood group O (18.09%) is associated followed by B and A whereas in age of onset between 30-40yrs, Blood group A (11.4%) followed by Blood group O and B are having equal incidence.

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In the age of onset 51-60yrs blood group O (11.42%) followed by equal incidence in Blood group A and B. In the age of onset >60yrs Blood group O (2.85%) followed by equal incidence in Blood groups A, B and AB.

DISCUSSION: Diabetes mellitus is a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolisms resulting from defects in insulin secretion, insulin action or both. ⁽¹⁾ The global burden due to diabetes is mostly contributed by Type2 Diabetes mellitus which contributes 80-95% of total Diabetic population. The estimates by the International Diabetic Federation (IDF) show that 285 million adults (20 to 79yrs) are affected by the disorder in 2010. Its prevalence will increase further to 438 millions in 2030. This accounts global increase by 54% nearly 70% of people with diabetes live in developing countries, the largest numbers are in Indian subcontinent and China. The prevalence of Diabetes in India as shown by multicentre study by Indian Council of Medical Research (ICMR) in 2000, in urban areas 12 to 19%, in rural areas 4% to 9%. A study from Rural Andhra Pradesh reported of 13.2%.⁽²⁾

Type 2 Diabetes mellitus is a polygenic disorder, caused by a cluster of susceptibility genes. These genes may be present without the phenotypic manifestations or the disease may be seen in the absence of these genes. It is also possible that these genes vary in various ethnic groups. The genetic etiology is clear in a group of monogenic type 2 Diabetes. Here the gene is clearly identifiable and the phenotypic presentation and treatment approaches well elucidated. These genes operate by producing Insulin resistance or B-cell secretary defect.⁽³⁾

The major Human blood group system is ABO. The blood group of a person depends upon the presence or absence of two genes, A and B. The majority of ABO determinants are expressed on the ends of long polylactosamine chains⁽⁴⁾ No diseases are known to result from the lack of expression of ABO blood group antigens, but the susceptibility to a number of diseases has been interrelated to a person's ABO phenotype. Such correlation remain conflicting and include the observation blood group 'A' persons are more frequently affected with coronary artery disease, venous thrombosis and atherosclerosis, while 'O' group people are protected against these diseases.^(5,6)

Dr. Faghaazzi and colleagues in French E3N study, analyzed data from the health questionnaires of the women and found that women with blood type B+ at 35% higher risk of type 2 diabetes than those with blood group O-ve.⁷ In India, data is lacking showing the association between blood groups and Type 2 Diabetes. In our study we have looked for such association. Blood group O (42.85%) followed by Group B (26.66%), A (24.76%) and AB (5.71%) are associated with Type 2 DM.

The data on distribution of blood groups and the diseases are conflicting. Some studies showing positive association and some are showing no association.⁸ Study from Bangladesh⁹ and in GenGlasgow¹⁰ described no positive association of DM and blood groups. But the association of DM with Blood group A was demonstrated by Mc Connell and Pyke.¹¹ The reports from Italy¹² and Trinidad¹³ showing an increased frequency of blood group B among diabetics. Whereas our results show a Blood group O followed by B and A. Showing the association with DM. There are many studies showing a significant association of blood group A with the Male diabetics. In the present study also showed that Males have higher incidence of Diabetes than females. In Males Blood group O (20%) had association with type 2 DM followed by B (16.9%) and A and AB blood groups. In females blood group O (22.85%) followed by A group (11.42 %) and B and AB.

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The distribution as per age of onset of Type 2 DM showing that the age group of 41-50 yrs (34.28%) is common affected with DM followed by 30-40yrs ,51-60 yrs and above 60 yrs. Among the 41-50 yrs the Blood group O (18.09%) is associated followed by B and A. In age of onset of DM between 30-40yrs Blood group A (11.4%) associated, followed by Blood group O and B with equal incidence. In the age of onset 51-60 yrs blood group O (11.42%) associated followed by equal incidence in Blood group A and B. In the age of onset of DM >60yrs Blood group O (2.85%) followed by equal incidence in Blood groups A, B and AB are associated.

CONCLUSION: The Global incidence of the Type 2 Diabetes is increasing in a dramatic way particularly in the developing countries. In our study there is an association between the Diabetes Type 2 and Blood groups. In our study the results showing that Blood group O followed by B and A having more positive association with Type 2 DM. In Males Blood group O (20%) followed by B (16.9%) and A and AB. In Females Blood group O (22.85%) followed by A group (11.42%) and B and AB are associated. The age of onset of Type 2 DM in 41-50yrs (34.28%), in 30-40 yrs (33.33%), in 51-60yrs (26.66%) and above 60 yrs (5.71%). Among them between 41-50yrs 18.09%, 30-40Yr 10.47% and 51-60yr 11.42% and above 60yrs 5.71% are associated with Blood group O. But it is not clear why there are associations between blood type and gender and age of onset in diabetes. We may conclude that blood group might have a strong association with gender and age of onset of Diabetes Mellitus Type2 and can be helpful for the evaluation of the disease in relation to age of onset and gender in Type 2 DM.

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