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Original Research

Evaluate the correlation of Pre-Diabetes, Diabetes and BMI with family history

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ABSTRACT:

Aim: To evaluate the correlation of Pre-Diabetes, Diabetes and BMI with family history**. Methods:** A Community based cross-sectional study was carried out in the Department of community medicine. Of 100, 65 male and 35 females were interviewed by using pretested semi structured interview schedule. Fasting Capillary blood glucose level techniques (According to WHO-2006. people who have 110 mg/dl to 125 mg/dl fasting plasma glucose are pre-diabetic and those higher than 126 mg/dl are diabetic) measured with the help of Glucometer. Family history of was obtained from each subject and classified into three groups, viz. 1= no family history of diabetes mellitus, 2= one parent affected and 3= both parents and siblings affected. WHO, 2008 criteria was used to assess the BMI. People who have <18 BMI are underweight, 18-24.9 normal weight and 25-30 overweight and >30 are obese. **Results:** In the present study overall prevalence of pre- diabetes was 15% and diabetes mellitus was 11%. Positive family history was observed more among pre-diabetics 26.67% and diabetics 27.27% as compared to respondents with normal blood glucose level 16.22%. Out of the total 100 respondents, familial risk was observed only in 14%. Out of which 9% respondents were having positive family history of one parent and 5% were of both parents and siblings. The association was found to be statistically significant. The statistically significant association was observed between family history and BMI. More than 50% respondents who had positive family history of diabetes have high BMI. **Conclusion:** Family history of diabetes mellitus was observed in 14% of total screened respondents. Out of which 9% were having either parent and 5% both parents and siblings.

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INTRODUCTION

Diabetes is fast becoming the epidemic of the 21st century.[1] Over the past 30 years, the status of diabetes has changed from being considered as a mild disorder of the elderly to one of the major causes of morbidity and mortality affecting the youth and middle-aged people.[2] It is estimated that 20% of global burden of diabetes is in South East Asian Region (SEAR), which will triple to 228 million by the year 2025 from the current 84 million.[3] World Health Organization (WHO) has projected the maximum increase in diabetes would occur in India.[4] The International Diabetes Federation (IDF) estimates the total number of diabetic subjects to be around 40.9 million in India and this is further set to rise to 69.9 million by the year 2025.[1] According to the National Urban Diabetes Survey, the prevalence of diabetes and pre-diabetes were 12.1% and 14%, respectively.[5] The Bangalore Urban Diabetes Study revealed that direct and indirect costs of diabetes care for patients undergoing treatment that involved hospitalization were approximately US$ 850 per patient per year. The cost of care is high and comparable to costs in other countries, especially if one keeps in mind the purchasing power parity.[6] Both Sweden and China have experienced an epidemiological transition from a predominance of infectious diseases to non-communicable diseases (NCDs). This transition occurred more rapidly in China than in Sweden.[7] China has the largest number of adults with T2DM, with a prevalence of 10.9% in 2013 based on a national representative survey.[8,9] Sweden has a T2DM prevalence of 7.0%, but this is projected to increase to 10.4% by the year 2050.[10] During the transition stage, when blood glucose levels are higher than normal but lower than the threshold used for the diagnosis of

T2DM, prediabetes is considered a significant risk factor for T2DM and macrovascular diseases.[11] Accordingly, it is the characterisation and identification of individuals in the prediabetic state that is important for the prevention, management and treatment of T2DM.[4,12] Most studies of TD2M have been conducted in countries with comparable socioeconomic structures. However, between China and Sweden there is a difference in the prevalence of adult T2DM: the Chinese population appears more disposed towards developing T2DM because of the nation's dramatic urbanization, that is ongoing, and its unique approach to nutrition. Despite this evidence, there have to date been no large, representative, populationbased comparative epidemiological studies which measure the burden of prediabetes and T2DM in China and Sweden. In addition, it is unclear whether the risks of prediabetes and T2DM differ between the two countries. A comparison of two populations living in different socioeconomic and political environments could help identify the burdens, as well as the behavioural and environmental factors, associated with prediabetes and T2DM. Accurate estimation of prediabetes and T2DM is necessary for raising public awareness, developing public health strategies, and allocating health resources for effective prevention and management.

MATERIALS AND METHODS

A Community based cross-sectional study was carried out in the Department of community medicine after taking the approval of the protocol review committee and institutional ethics committee. Among 100 respondents of 20-65 years age group. In which 65 male and 35 females were interviewed by using pretested semi structured interview schedule. Visits were made one day prior to inform each respondents remain empty stomach overnight (at least 8hours) and get their blood sugars checked on the following. Consent was taken to all respondents. Information was collected on family history with the help of semi-structured pretested questionnaire. Next day morning between 6am-8am, blood sample was collected for the purpose of estimation of fasting capillary glucose with the help of glucometer. Fasting blood glucose level was also informed to all the respondents along with the education on prevention of diabetes & place of treatment for individuals with higher blood sugar. Chi-square test was applied for see the association. P<0.005 was considered to be statistically significant. Fasting Capillary blood glucose level techniques (According to WHO-2006. people who have 110 mg/dl to 125 mg/dl fasting plasma glucose are pre-diabetic and those higher than 126 mg/dl are diabetic) measured with the help of Glucometer. Family history of was obtained from each subject and classified into three groups, viz. 1= no family history of diabetes mellitus, 2= one parent affected and 3= both parents and siblings affected. WHO, 2008 criteria was used to assess the BMI. People who have <18 BMI are underweight, 18-24.9 normal weight and 25-30 overweight and >30 are obese. Known cases of diabetes with age group between 20-67 years were included in this study.

Pregnant women and known cases of diabetes respondents were excluded from this study. Known diabetes respondents were included only in screening for prevalence estimation. Pregnant women were excluded due to possible glucose tolerance status in this group due to pregnancy.[13]

RESULTS

In the present study overall prevalence of pre-diabetes was 15% and diabetes mellitus was 11%. It is observed that 41 (41%) of the respondents were in the age group of 20-30 years followed by above 50 years 21(21%). While 19% respondents were in age-group of 30 to 40 years and 19 (19%) were in 40-50 years. Out of the total 100 respondents, male (65%) and female (35%). More than half (57%) of the respondents belonged to other backward caste followed by schedule caste (33%). Only 10% respondents belong to general caste. In the present study majority 77(77%) of the respondents were married. While about 20(20%) were unmarried and 3% were widow/widower.

Table 1 demographic profile of the patients

Gender	100	Percentage
Male	65	65
Female	35	35
Age		
20-30	41	41
30-40	19	19
40-50	19	19
Above 50	21	21
Marital status		
married	77	77
Unmarried	20	20
widow/widower	3	3

Table 2. Family history

Parameter	Number of patients	Percentage
Positive family history of one parent	9	9
Both parents and siblings	5	5
Total familial risk was observed	14	14

Out of the total 100 respondents, familial risk was observed only in 14%. Out of which 9% respondents were having positive family history of one parent and 5% were of both parents and siblings.

Table 3: Association between positive family history of diabetes mellitus and respondents fasting blood glucose level

Fasting blood glucose level		Family history of diabetes mellitus				
		No Family history		Positive family history		Statistical values
	No.	No.	%	No.	%	
Normal blood glucose level	74	62	83.78	12	16.22	-2=29.77; df=2.5; p< 0.001
Pre- Diabetics	15	11	73.33	4	26.67	
Diabetics	11	8	72.73	3	27.27	

Table- 3 Show that association of positive family history and risk of diabetes mellitus. Positive family history was observed more among pre-diabetics 26.67% and diabetics 27.27% as compared to respondents with normal blood glucose level 16.22%. The association was found to be statistically significant.

Table 4: Association of positive family history of diabetes with BMI

BMI (N-20)	Family History of diabetes				
	No family history		Positive family history of diabetes mellitus		Statistical values
	No.=14	%	No.=6	%	
<18.5	1	7.14	1	16.67	-2=7.4; df=2; p< 0.02
18.5-24.9	9	64.28	2	33.33	
>25	4	28.57	3	50	

The finding (table 4) shows the statistically significant association was observed between family history and BMI. More than 50% respondents who had positive family history of diabetes have high BMI.

DISCUSSION

The American Diabetes Association classifies the occurrence of fasting plasma glucose between 100 and 125 mg/dL as an indicator of prediabetes. The risk of developing prediabetes includes genetic disposition, obesity, sedentary lifestyle, family history, gestational diabetes, a lack of physical activity, and ethnicity. If focused solely on young adolescents and adults the issues of obesity, family history of type 2 diabetes, and reaching puberty, exposes them to prediabetes. It also makes the young prediabetics prone to long-term risks of complications.[14,15] This was the first community based study in this area, assessing the association family history is considered an important factor to detect individuals at increased risk developing type 2 diabetes mellitus. In the present study prevalence of pre-diabetes was 15% and diabetes 11 %. Out of the total 100 respondents, familial risk was observed only in 14%. Out of which 9% respondents were having positive family history of one parent and 5% were of both parents and siblings. Positive family history was observed more among pre-diabetics 26.67% and diabetics 27.27% as compared to respondents with normal blood glucose level 16.67%. The association was found to be statistically significant. Significant difference was observed on diabetes, pre-diabetes with family history. The association was found to be statistically significant. This is coherent with the findings of other studies.[16-21] The findings show that statistically significant association found with positive family history and BMI. More than 50% respondents who had positive family history of diabetes were also observed high BMI . This is coherent with the study.[22]

CONCLUSION

Family history of diabetes mellitus was observed in 14% of total screened respondents. Out of which 9% were having either parent and 5% both parents and siblings. Due to high prevalence of pre-diabetes, it is necessary to link them with non communicable disease program for life style modification.

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