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A Study of Newly Detected Diabetes Mellitus Patients among Population of Rural Field Practice Area of a Tertiary Care Centre in Maharashtra

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ABSTRACT

Background: Diabetes is traditionally known as silent disease and case detection require active and opportunistic screening efforts. Diabetes is no more restricted in urban areas only but is also established at rural areas as well.

Material and methods: A cross sectional study was carried out in the field practice area of a tertiary care centre. A total of 290 participants who had given written informed consent were included in the study by camp approach. WHO guideline (2006) was used for diagnosis of diabetes. People showing fasting plasma glucose >126 mg/dl or 2 hour plasma glucose >200 mg/dl were diagnosed as diabetics.

Results: Proportion of newly detected diabetes observed in the study was 7.5%. The newly detected diabetes cases increased i.e. 8 out of 143 (36.7%) in participants above age of 50 years as compared to 1 out of 38 (4.5%) in participants in age group 20-30 years. The proportion of diabetes was more in male participants i.e. 15 in 164 (8.4%) as compared to female participants i.e. 7 in 104 (6.3%). A significant association was found between diabetes and high BMI.

Conclusion: The need for awareness regarding diabetes and its risk factors in the community is needed as many hidden cases were found. High BMI is one of the risk factor for diabetes mellitus.

Key words: Diabetes, Rural field practice area

INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces[1]. Both the number of cases and prevalence of diabetes have been steadily increasing over the past few decades.

The prevalence of Type 2 diabetes rates continue to increase with increasing number of patients at risk of diabetes related complications[2]. The various complications occur due to diabetes are myocardial infarction, stroke, renal failure, blindness etc[3]. The global prevalence of diabetes has increased from 4.7% to 8.5% in adult population since 1980 to 2014. In 2015; an estimated 1.6 million deaths were directly caused by diabetes[4]. Almost half of all deaths attributable to high blood glucose occur before the age of 70 years. WHO projects that diabetes will be seventh leading cause of death worldwide in 2030.

In India, 69.2 million people suffer from diabetes and the number will increase to 123 million by 2040. India has the second highest prevalence of diabetes in adult population i.e. 9.1%. Out of these, almost 1.1 million people die from diabetes related complications[5]. Inspite of such high burden, more than half i.e. 52.1% persons with diabetes are un-

aware of their disease. In diabetic patients less than one third have their diabetes under control[6].

Diabetes is traditionally known as silent disease and case detection require active and opportunistic screening efforts. Diabetes is no more restricted in urban areas only but is also established at rural areas as well. Rural India is more affected by lack of availability of adequate health care resources resulting in lot of undiagnosed hidden cases which remain untreated in the community resulting in serious complications. Limited awareness, affordability and accessibility are other major concerns in rural as well as urban slums[7]. The present study was carried out to find the prevalence of Type 2 diabetes in rural area of Maharashtra.

MATERIAL AND METHODS:

A community based cross sectional study was conducted in rural field practice area of medical college, Maharashtra. Participants were recruited by the health camp approach. Communication activities like pamphlet distribution, what's up messages and house to house a visit were conducted by health care workers and interns posted in rural health training centre. Participants who were having diabetes were excluded from the study. A total of 290 participants were included in the study. Informed written consent was taken from the participants. Purpose of the study was explained to the participants in their own language and was assured about the confidentiality of the results. Physical measurements like weight and height were taken using standard apparatus. Body Mass Index (BMI) was calculated in Kg/m^2. Random blood sugar was estimated for screening at the time of camp and the participants who were having equal to or more than 200 mg/dl were further investigated at the rural health training centre for fasting and post- prandial blood sugar levels within one week.

Capillary blood glucose level was measured taking aseptic precautions. The subjects involved in study were asked to stay empty stomach overnight for twelve hours and not consume anything till the fasting capillary glucose was measured. The capillary blood glucose was again measured after two hours post-prandial.WHO guideline (2006) was used for diagnosis of diabetes and impaired glucose tolerance. People showing fasting plasma glucose >126 mg/dl or 2 hour plasma glucose >200 mg/dl were diagnosed as diabetics[8].

The data collected using questionnaire was entered in a Windows Excel spread sheet. Statistical analysis was done using Epi Info software version 7.1.2.0. Odds ratio and 95% CI was calculated for various variables observed in the study.

RESULTS

A total of 290 participants were included in the study. Among them 22 participants were newly detected for diabetes so proportion of newly detected diabetes observed in the study was 7.5%.

Majority of the participants included in the study were above 50 years i.e.151 (52.1%) whereas 53(18.3%) participants were in the age group between 40-50 years followed by 39(13.4%) in age group between 20-30 years. Proportion of newly detected diabetics increased with age i.e. 8 (36.7%) of participants over 50 years age followed by 7 (31.8%) participants in age group between 40-50 years were newly detected diabetics whereas only 1 (4.5%) participants in age group between 20-30 years were diabetics.

Table 1: Association between socio-demographic variables and diabetes

Risk factors	Diabetes		OR (95% CI)	P value
	Yes (%)	No (%)		
Age				
20-30 years	1 (2.6)	38 (97.4)	1	
30-40 years	6 (12.8)	41 (87.2)	5.56 (0.64-48.34)	0.185
40-50 years	7 (14.9)	46 (85.1)	5.78 (0.68-49.09)	0.152
>50 years	8 (5.3)	143 (94.7)	21.26 (0.25-17.52)	0.769
Gender				
Male	15 (8.4)	164 (91.6)	1.35 (0.53-3.44)	0.674
Female	7 (6.3)	104 (93.7)	1	

Table 2: Association between BMI and diabetes

BMI (Kg/m^2)	Diabetes		OR (95% CI)	P value
	Yes	No		
Normal(18-25)	3 (2.3%)	129 (97.7%)	1	
Overweight(26-30)	8 (6.9%)	108 (93.1%)	3.18 (0.82-12.30)	0.145
Obese Class I(31-35)	9 (25.7%)	26 (74.3%)	14.88 (3.77-58.74)	0.000
Obese Class II(>35)	2 (28.6%)	5 (71.4%)	17.20 (2.32-12.70)	0.009

Table 1 shows that 15 (8.4%) male participants and 7 (6.3%) of female participants had diabetes. The odds of getting diabetes were found 1.34 times higher among male participants as compared to female participants. There was no significant association between age of the participants, gender and diabetes in this study.

Table 2 shows that the participants having high BMI >35 i.e. 2 out of 5 (28.6%) had diabetes followed by 9 out of 26 i.e. 25.7% who had BMI between 31-35 whereas only 3 out of 139 i.e. 2.3% participants had diabetes whose BMI was normal. There was significant association between high body mass index and development of diabetes.

It was observed that more patients are coming to rural health training centre for blood sugar estimation after awareness through camp approach.

DISCUSSION

In the recent statistics, diabetes which was erstwhile associated with urban lifestyle is also prevalent in the rural population. This may be because urban ways of living and sedentary lifestyles are gradually being adopted by the rural masses as well. In the present study, the proportion of diabetes was found to be 7.5% among the study participants. In a study carried out by Rathod HK et al in Maharashtra found prevalence of 9.1% in a rural community[9]. Similar prevalence has been reported by Mohan V et al from central Kerala (9%) [10]. A study from Gujarat by Himanshu KN et al reported a higher prevalence of 13.8%[11], while a study from the northern state of Kashmir carried out by Javed Ahmad et al found a much lower prevalence of 6.05%[12].

It was noteworthy that proportion of diabetes in age group 30-40 years was 27.3% in the present study whereas proportion was 4.5% for participants in age group 20-30 years, 31.8% for 40-50 years, 36.7% for >50 years. In a study carried out by Singh PS and et al[13] age wise prevalence of diabetes was 2.94% for 25-39 year, 9.24% for 40-49 year, 13.0% for 50-59 year, 16.16% for 60-69 year and 19.74% for >69 years and findings by another study carried out by Shrivastava S and Ghorpade were prevalence of diabetes as 19.8% (60-69 years), 17.1% (40-49 years), 16.8% (50-59 years), and 13.6% (>69 years)[14]. The present study showed no statistical difference in the proportion of male and female participants and such observation was also found in the study carried out by Koria B et al[15].

Proportion of diabetes was higher in participants whose BMI was more than 25. The risk of getting diabetes increased in the participants who were overweight and obese and such observations were also found in the study carried out by Raghvendra AH et al[16]. As BMI is modifiable risk factor for causing diabetes and it was significantly associated in the present study, there is need for awareness in the community to reduce weight by physical exercise, dietary modifications etc. Many other studies carried out in different geographic areas had shown significant association between BMI and prevalence of diabetes[17, 18].

CONCLUSION

The need for awareness regarding diabetes and its risk factors in the community is needed as many hidden cases were found. High BMI is one of the risk factor for diabetes mellitus.

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