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POPULATION BASED SCREENING FOR DIABETES: REPORT FROM A TERTIARY CARE INSTITUTE IN BIHAR, INDIA

Medicine

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ABSTRACT

Diabetes is an emerging health problem across the globe with an increasing trend observed over the years. Around 75% of subjects with DM live in low- and middle-income countries (LMICs). While in urban areas of LMICs, diabetes is well recognized as a public health priority; recent prevalence data suggest that diabetes is an increasing problem among rural populations as well . **Methodology:** Diabetes screening camps were organized by the Department of Community Medicine in the rural field practice areas of Sri Krishna Medical College & Hospital, Muzzafarpur, Bihar. Data was collected from the participants using a structured interview schedule. **Results:** Total 213 people above the age of 18 years attended the camps. Majority of the camp attendees were females (57.8%).45.1%) of the subjects were between 41-60 years of age. In the present study proportion of people screened to have DM was found to be 17.4% (>200 mg/dl), and 28.2% were detected with impaired glucose tolerance (140 mg/dl-199 mg/dl). **Conclusion:** This study also highlights a significant burden of undiagnosed cases of Diabetes in the community. This indicates the need for systematic screening and awareness program to identify the undiagnosed cases in the community and offer early life style modifications, treatment and regular follow up.

KEYWORDS

Diabetes, Screening, Prevalence

INTRODUCTION

Diabetes is an emerging health problem across the globe with an increasing trend observed over the years. Around 75% of subjects with DM live in low- and middle-income countries (LMICs). While in urban areas of LMICs, diabetes is well recognized as a public health priority; recent prevalence data suggest that diabetes is an increasing problem among rural populations as well [1]. India is the diabetes capital with home to 69.1 million people with DM, the second highest number of cases after China. According to International Diabetes Federation estimates, around 415 million people had DM in 2015 and this number is expected to rise to 642 million by 2040 [2]. India is home to 69.1 million people with DM and is estimated to have the second highest number of cases of DM in the world after China in 2015 [2]. The prevalence of DM in India ranges from 5–17%, with higher levels found in the southern part of the country and in urban areas [3-6].

DM continues to increase as a result of rapid cultural and social changes, which include: ageing populations, increasing urbanization, dietary changes, reduced physical activity and unhealthy behavior. Historically a disease of the affluent, recent epidemiological evidence indicates a rising DM incidence and prevalence in urban India's middle class and working poor [7]. Indians are also believed to have a greater degree of insulin resistance and a stronger genetic predisposition to diabetes [8]. In India, urbanization, changes from traditional healthier diets to high-refined carbohydrate intake, and sedentary lifestyle have contributed to a steep increase in the prevalence of diabetes in India [9].

In India, especially in urban areas, though there is access to screening methods and antidiabetic medicines, very few people access the facilities for screening [10]. There could be various reasons for people not undergoing screening ranging from lack of awareness, poverty, lack of time, lack of priority for health to a negligent attitude. There is evidence throughout the world that screening for diabetes will result in early diagnosis and treatment. A study by Chatterjee suggests that screening for diabetes may be cost-effective intervention as compared to no screening [11]. In India, there is no systematic awareness and screening programme being offered for diabetes, except in few places where the pilot project of national program for prevention and control of cancer, diabetes, cardiovascular diseases and stroke [12].

Usually, the diagnosis of diabetes is an outcome of investigations when patient presents with signs and symptoms of the disease or signs of complication. Approximately, 50-70% of people with diabetes remain undiagnosed in both developed [13] and developing countries [14] and these individuals often present with diabetes complications[15] Undiagnosed diabetes and pre diabetes, therefore, need to be detected and treated early through community-based screening [16].

With this background, an understanding of the changing epidemiology of diabetes in India is required. To estimate the burden of hidden cases in the community, this study was planned and executed to screen the general population irrespective of high-risk factors.

METHODOLOGY

On account of World Diabetes Day that is 14th November 2019,diabetes screening camps were organized by the Department of Community Medicine in the rural field practice areas of Sri Krishna Medical College & Hospital, Muzzafarpur, Bihar. Local health workers like ASHA, ANM, Anganwadi workers working in the designed areas were informed and sensitized beforehand about the camps and all the activities. They were given responsibility of distributing pamphlets among the community and motivate them to attend the same.On the day of the camp, they were to mobilize the community. Informed consent was taken from all the participants who came for the camp.

Data was collected from the participants using a structured interview schedule which contained information regarding socio demographic details, various risk factors for diabetes like, smoking and alcohol consumption, self-perceived physical activity levels, family history of diabetes and history of diabetes in the past. Height and weight were checked using standardized methods and body mass index (BMI). BMI was categorized using the classification recommended for Asians [17]. Blood pressure was checked twice using BP apparatus and the lowest reading was recorded. Individuals diagnosed by a physician and on antihypertensive medications (self-reported) and/or those who had systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg on examination werelabeled as having hypertension. —Joint National Committee 8 (JNC8) Criteria[18]. Risk factors were assessed through questionnaire and physical examination. Random blood sugar using Roche ACCU-CHEK was used to screen diabetes mellitus, random blood sugar >200 mg/dl was used as cutoff to label as diabetics and 140-199 mg/dl was used as cut off to label as IGT (Impaired Glucose tolerance) [18].

RESULTS

Total 213 people above the age of 18 years attended the camps. Majority of the camp attendees were females (57.8%).45.1%) of the subjects were between 41-60 years of age. Age distribution has been shown in Table 1. Among the study participants, 37.0% were illiterate. Lifestyle characteristics included stress, tobacco and alcohol. 28.6% participants perceived to have work or any other stress. 8.9% were smokers at present and 13% consumed alcohol at least once weekly. Self-perceived physical activity level was enquired and 16.3% of the study group considered themselves to have sedentary life style. Nearly one third (33.8%) had a positive family history of diabetes among first

degree relatives. As far as BMI was considered, nearly half of the population (46.3%) were either overweight or obese. 22.5% of the participants either were known cases of hypertension or diagnosed to have high blood pressure during the course of the study.

Among 213 people screened for diabetes during the camp, majority 63.4% never had undergone any modality of investigation for DM before.In the present study proportion of people screened to have DM was found to be 17.4% (>200 mg/dl), and 28.2% were detected with impaired glucose tolerance (140 mg/dl-199 mg/dl). Data has been depicted in tabular form in table 2. Among those with IGT or diabetic status on screening, 92.6% were known diabetics, the screening modality diagnosed the rest 7.4%. It signifies that in-spite of diseased condition, there is poor glycemic control among the study participants.

In the present study on univariate analysis alcohol intake, family history of diabetes andhigh BMI were found to be more among people with diabetes and the difference was found to be statistically significant with p value < 0.05. (Table 3)

Table 1: Distribution of study participants according to age and their glycemic status

Age group (in years)	Diabetes	IGT	Normal	Total
18-40	4 (6.2%)	9 (13.8%)	52 (80.0%)	65 (30.5%)
41-60	11 (11.5%)	23 (23.9%)	62 (64.6%)	96 (45.1%)
>60	21 (40.4%)	28 (53.8%)	3 (5.8%)	52 (24.4%)
Total	37 (17.4%)	60 (28.2%)	116 (54.4%)	213 (100 %)

Table 2: Distribution of study participants according to results of diabetes screening

Diabetic status	Number	Percentage
Normal glucose <140 mg/dl	37	17.4%
Impaired glucose tolerance (140-199 mg/dl)	60	28.2%
Diabetic Mellitus (>200mg/dl)	116	54.4%

Table 3: Table showing association of various risk factors with diabetes

Risk factor	Diabetic	Normal	Number (%)
Illiterate	11 (13.9%)	68 (86.1%)	79 (37.0%)
Stress	9 (14.8%)	52 (85.2%)	61 (28.6%)
Tobacco	4 (21.1%)	15 (78.9%)	19 (8.9%)
Alcohol*	35 (57.4%)	26 (42.6%)	61 (13.0%)
Physical activity	5 (14.3%)	30 (85.7%)	35 (16.3%)
Hypertension	12 (25.0%)	36 (75.0%)	48 (22.5%)
Family history of diabetes*	28 (38.9%)	24 (61.1%)	72 (33.8%)
High BMI*	26 (26.3%)	73 (73.4%)	99 (46.3%)

*Signifies p value of less than 0.05

DISCUSSION

In the present study proportion of people having diabetes was found to be 17.4% and another large proportion (28.2%) had impaired glucose tolerance. The first prevalence study in India was done by Indian Council of Medical Research (ICMR) at the national level (1979) and they reported 2.8% prevalence ofdiabetes in rural areas [19].Over the last few years, various studies have reported similar prevalence of diabetes from various parts of the country [20-23].These figures imply that though the prevalence of DM varies in different settings, it is certainly quite high and warrants immediate attention.

Findings from the current study adds to the snowball of evidence suggesting that diabetes is no longer confined to urban areas of India and is a matter of concern in rural areas as well. In our study increase in age, alcohol intake, family history of diabetes, overweight/obesity and hypertension were found to be associated with diabetes. Many studies have also found a positive association with family history, hypertension and overweight with Diabetes [22-26].Nearly half (45.6%) of the people were found to have random blood sugar more than 140 mg/dl indicating highproportion of population at risk of developing diabetes in future if preventive measures including life style modification are not followed.

CONCLUSION

This study also highlights a significant burden of undiagnosed cases of Diabetes in the community. This indicates the need for systematic screening and awareness program to identify the undiagnosed cases in the community and offer early life style modifications, treatment and regular follow up.

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