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A Community Based Study on Prevalence, Knowledge and Self-care practices of Diabetes Mellitus in Punjab

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Abstract

Diabetes Mellitus (DM)is a chronic, non-communicable, and expensive public health disease which is fast becoming the epidemic of 21st century. Regular screening of adults is essential for early detection and care. This study assessed the prevalence and awareness of Diabetes Mellitus (DM) in Rural and Urban field practice area a Tertiary care teaching Hospital in Punjab.A Cross-sectional community based study among 950 adults above 20 years of age was undertaken in field practice area of a tertiary care teaching hospital in Punjab. Data was collected on socio-demographic variables. Diabetes was diagnosed as per WHO criteria, i.e. if Fasting blood glucose levels were >/= 126 mg/dL or a 2-h post load glucose ≥ 200 mg/dl (11.1 mmol/l) during an OGTT.Structured questionnaire was used to assess the knowledge & practices regarding Diabetes Mellitus. The prevalence of Diabetes Mellitus , in the present study was found to be 10.0% (7.4% in Rural & 12.6% in Urban area) with known cases of Diabetes Mellitus being 6.9% of study participants. Nearly 100% study subjects reported that they were aware about a condition called Diabetes and were aware that it is a non-infectious disease and can occur at any age. The most common symptom of Diabetes Mellitus identified was increased frequency of urination andIntake of sweets/sugar was most common risk factor. However knowledge about other risk factorsand complications of Diabetes Mellituswas poor. Out of 95 diabetics, only 69.5% of diabetic subjects were using medication regularly, 61.1% got their blood glucose monitored regularly, 55.8% made specific dietary changes & 34.7% consulted the physician regularly.This study emphasises the need for increasing Diabetes Mellitus awareness in both urban and rural areas.

Keywords: Diabetes Mellitus, Knowledge, Prevalence, Practices

Introduction

Prevalence of Type II Diabetes Mellitus is increasing globally more so in developing countries like India due to rapid urbanization. Diabetes Mellitus is emerging as a major health-care challenge for India. The disease currently affects more than 62 million Indians, which is more than 7.1% of India's adult Population. An estimate shows that nearly 1 million Indians die due to Diabetes every year. The average age on onset is 42.5 years.[1]

The high incidence is attributed to a combination of genetic susceptibility plus adoption of a high-calorie, low-activity lifestyle by India's growing middle class.[2] Additionally, a study by the American Diabetes Association reports that India will see the greatest increase in people diagnosed with diabetes by 2030.[3]In Diabetes Mellitus, macro-vascular disease is the predominant cause of mortality, with CVD accounting for 52–80% of deaths, followed by renal disease (heralded by albuminuria) 10–20% ,and Cerebro-vascular disease 15%, which is approximately twice that seen in the population without Diabetes Mellitus in the first five years following diagnosis[4].

In spite of its high prevalence, and being a major cause of mortality, Diabetes Mellitus remains highly undiagnosed. Undiagnosed Diabetes Mellitus is associated with increased risk of all-cause mortality. Delayed diagnosis and inadequate or improper treatment results in poor disease outcome.[5]

Self-care in Diabetes Mellitus has been defined as an evolutionary process of development of knowledge or awareness by learning to survive with the complex nature of the Diabetes Mellitus in a social context.[6,7]The total direct cost for diabetes management has doubled over the years.It has thus become a great economic challenge as it drains between 5-25 % of the family income of an average Indian[8]. Therefore, prevention is important both on monetary and human matters. There is an increasing amount of evidence that the patient education is the most effective way to lessen the complications of diabetes and its management.[9]

Knowledge about the level of awareness about Diabetes Mellitus in a population is the first step in formulating a prevention programme for Diabetes. Thus the present study is a step in this direction to assess the prevalence of Diabetes Mellitus & to identify, investigate and evaluate knowledge and practices regarding Diabetes Mellitusin the field practice area of a Tertiary care Teaching Hospital of Punjab.

Aims and Objectives

The aim of the study was to assess the prevalence &awareness of Diabetes Mellitus in urban and rural population of field practice area of Punjab.

Materials and Methods

Study Setting:

The study was conducted between the period of August 2013 to March 2014 at the Urban and Rural field practice area of a Tertiary care teaching hospital in Punjab.

This was a cross sectional community based study among 950 adults aged 20 years and above. The sample size was estimated based on different studies carried out in India which reported the prevalence of Diabetes among adults between 9.0% to 16.9%. Thus considering a prevalence of Diabetes Mellitus as 11.0%, a sample size of 809 was calculated. This sample size was increased to 950 in order to make it more representative and to compensate for the design effect.

A complete list of all individuals in the study area aged 20 years and above was obtained with their addresses. The required numbers of study subjects (950) were then selected for present study by simple random sampling. 475 subjects were selected from Urban area and 475 subjects were selected from Rural area.

Method of data collection:

The data was collected by house to house visits using a pretested semi-structured questionnaire. This questionnaire was tested for appropriateness by conducting a pilot study. Before collection of data, written informed consent was taken from the study subjects after explaining the importance of the study in detail. The data was collected by interview method by a single physician. Questionnaire included information regarding age, sex, education, occupation, diet, smoking, alcoholism and family history of the disease. Questions related to knowledge and practices were included in the questionnaire. The study subjects were then requested to remain fasting (for at least 8 hrs) on next morning for venous blood sample collection. After collection of fasting blood in fluoride vial they were given 75 gms of oral

glucose and a blood sample was collected in fluoride vial after 2 hrs. The blood samples were transported to Rural / Urban health centre lab for blood glucose estimation (glucose-oxidase-peroxidase method). Diabetes was diagnosed as per WHO criteria, i.e. if Fasting blood glucose levels were >/= 126 mg/dL or a 2-h post load glucose ≥ 200 mg/dl (11.1 mmol/l) during an OGTT. Known cases of Diabetes Mellitus on treatment that came in the study sample were subjected to only fasting blood sugar estimation to see if blood glucose levels were controlled. Newly diagnosed cases of Diabetes Mellitus were referred to respective health centers of GSMCH and started on treatment. For pre-diabetes, suggestions were given regarding physical activity, diet, weight reduction, control of blood pressure and repeat FBS levels once a year.

Data was analysed using SPSS 17.0. Proportions were calculated with 95% confidence intervals, and Chi-square test was applied.

Results

A total of 950 eligible individuals were interviewed for the study. The prevalence of diabetes was estimated to be 10 % (95).

Impaired glucose tolerance was seen in 14(1.5%) of all study subjects, of which 11(2.3%) were in rural area and 03(0.6%) were in urban area. Among 95 diabetic cases, 66 (6.9%) were known/ old cases of Diabetes Mellitus and 29 (3.1%) were newly diagnosed Diabetes Mellitus cases. Of the 66 known/ old cases of Diabetes Mellitus, 23 (34.8%) were in rural area and 43 (65.2%) were in urban area. Out of 29 newly diagnosed cases of Diabetes Mellitus, 12 (41.4%) were in rural area and 17 (58.6%) were in urban area.

The study population included 487 (51.3%) of study subjects in 20-39 years of age group and 463 (48.7%) of study subjects in ≥40 years of age group. 425 (44.7%) were males and 525 (55.3%) were females. Majority i.e. 758 (79.8%) of study subjects were married.

Regarding the educational status, 276 (29.1%) were matric pass while only 88 (9.3%) were illiterate. As regards the socio-economic status, 310 (32.6%) of the study subjects were belonging to class IV and only 49 (5.2%) belonged to class I (modified BG Prasad classification of socioeconomic status). (Table 1)

Table 1: Distribution of study subjects according to socio-demographic profile

Characteristics	**Grades**	**Rural (N=475) n(%)**	**Urban (N=475) n(%)**	**Total (N=950) n(%)**	**Statistical analysis**
Age distribution	20-39 years	260 (54.7)	227 (47.8)	487 (51.3)	**χ^2= 4.6**
	≥40 years	215 (45.3)	248 (52.2)	463 (48.7)	**p < 0.05**
Sex distribution	Male	223 (47.0)	202 (42.5)	425 (44.7)	χ^2=1.9
	Female	252 (53.0)	273 (57.5)	525 (55.3)	p>0.05
Marital Status	Unmarried	74 (15.6)	56 (11.8)	130 (13.7)	χ^2=3.0
	Married	370 (77.9)	388 (81.7)	758 (79.8)	p>0.05
	Separated / Widowed	31 (6.5)	31 (6.5)	61 (6.5)	
Religion	Hindu	156 (32.8)	237 (49.9)	393 (41.4)	**χ^2= 29**
	Sikh	313 (65.9)	235 (49.5)	548 (57.7)	**p < 0.001**
	Muslim	06 (1.3)	03 (0.6)	09 (0.9)	
Occupation	Professional/ Skilled	159 (33.5)	135 (28.4)	294 (30.9)	χ^2=5.4
	Semi- Skilled/ Unskilled	54 (11.4)	43 (9.1)	97 (10.2)	p>0.05
	Unemployed	262 (55.2)	297 (62.5)	559 (58.8)	
Education	Illiterate	71 (14.9)	17 (3.6)	88 (9.3)	**χ^2=50.8**
	Primary	77 (16.2)	84 (17.7)	161 (16.9)	**p<0.001**
	Middle	83 (17.5)	84 (17.7)	167 (17.6)	
	Matric	143 (30.1)	133 (28)	276 (29.1)	
	Higher Secondary	61 (12.8)	79 (16.6)	140 (14.7)	
	Graduate	34 (7.2)	56 (11.8)	90 (9.5)	
	Postgraduate & Above	06 (1.3)	22 (4.6)	28 (2.9)	
Socio- Economic Status (Modified BG Prasad Classification)	Class I	18 (3.8)	31 (6.5)	49 (5.2)	**χ^2=39.2**
	Class II	59 (12.4)	114 (24)	173 (18.2)	**p<0.001**
	Class III	137 (28.8)	134 (28.2)	271 (28.5)	
	Class IV	162 (34.1)	148 (31.2)	310 (32.6)	
	Class V	99 (20.8)	48 (10.1)	147 (15.5)	

Table 2: Knowledge of Study Subjects Regarding Diabetes Mellitus

Knowledge Parameters	Rural (N=475)		Urban (N=475)	
	Diabetic (N=35) n(%)	**Non-Diabetic (N=440) n(%)**	**Diabetic (N=60) n(%)**	**Non- Diabetic (N=415) n (%)**
Heard of DM	35(100)	436(99.1)	60(100)	414(99.8)
Diabetes is an infectious disease	01(2.9)	05(1.1)	01(1.7)	00(00)
Who all can be affected with DM				
• Any age	32(91.4)	374(85.0)	56(93.3)	386(93.0)
• Elderly	03(8.6)	57(12.9)	04(6.7)	27(6.5)
• Young people	00(00)	05(1.1)	00(00)	01(0.2)
What according to you are symptoms of DM				
•				
• Increased frequency of urination	30(85.7)	299(67.9)	48(80.0)	293(70.6)
• Increased thirst	19(54.3)	61(13.9)	42(70.0)	99(23.9)
• Feeling of weakness	17(48.6)	103(23.4)	43(71.7)	130(31.3)
• Increased appetite	05(14.3)	49(11.1)	24(40.0)	50(12.1)
• Wt. Loss	05(14.3)	37(8.4)	16(26.7)	26(6.3)
• Delayed wound healing	05(14.3)	107(24.3)	07(11.7)	84(20.2)

It was observed in present study that nearly 100% of study subjects (diabetics and non-diabetics) had heard of Diabetes Mellitus. Majority of diabetic subjects knew that Diabetes is a non- infectious disease with only 2.9% of diabetic subjects in rural area and 1.7% of diabetic subjects in urban area, who thought it was infectious. 91.4% diabetic subjects in rural area and 93.3% diabetic subjects in urban area reported that Diabetes can affect any age. In rural area 85.7% of diabetics and 67.9% of non-diabetics said that increased frequency of urination was the major symptom of Diabetes, while in urban area 80% of diabetics and 70.6% of non-diabetics reported similar findings.(Table 2)

Knowledge (Table 3) of study subjects regarding risk factors of Diabetes revealed that 86.1% of non-diabetics in rural area and 89.6% of non-diabetics in urban area thought that DM occurs due to eating more sugar or sweets. While 80% diabetic subjects in rural area and 88.3% diabetic subjects in urban area thought the same. 28.2% of non-diabetics in rural area and 41.7% of non-diabetics in urban area thought that sedentary habits are a major risk factor. 34.3% diabetics in rural area and 53.3% diabetics in urban area thought the same. Hereditary risk factor was reported by 37.1% of diabetics in rural area and 61.7% of diabetics in urban area and by 30.0% and 46.7% of non-diabetics in rural and urban areas respectively.

Table 3: Knowledge of Study Subjects Regarding Risk Factors of Diabetes Mellitus

Risk factors of DM	Rural (N=475)		Urban (N=475)	
	Diabetic (N=35) n(%)	**Non- Diabetic (N=440) n(%)**	**Diabetic (N=60) n(%)**	**Non- Diabetic (N=415) n(%)**
1. Eating more sugar/sweet	28(80.0)	379(86.1)	53(88.3)	372(89.6)
2. Sedentary Habit	12(34.3)	124(28.2)	32(53.3)	173(41.7)
3. Hereditary	13(37.1)	132(30.0)	37(61.7)	194(46.7)

Table 4 shows the Knowledge of study subjects regarding management and complications of Diabetes Mellitus. Majority of diabetic subjects i.e.74.3% In rural area and 91.7% in urban area were of the view that Diabetes is a treatable disease. 94.3% of diabetic subjects in rural area and 100%diabetic subjects in urban area were of the opinion that DM can be prevented or controlled by lifestyle measures. The major lifestyle measure reported was dietary modification by diabetics (91.4% and 100%) and non-diabetics (90.5% and 98.8%) in rural and urban areas respectively, followed by increasing physical activity (Rural: Diabetics-85.7%, Non-diabetics-68.9% Urban: Diabetics-93.3%, Non-diabetics-91.3%). 71.4% diabetics and 41.6% non-diabetics in rural area and 65% diabetics and 56.6% non-diabetics in urban area were aware about complications of DM. Awareness regarding major complication reported among study subjects in rural area (65.7% diabetics and 33.2% non-diabetics) and in urban area (60% diabetics and 47.5% non-diabetics) was eye problems, followed by kidney problems (Rural: diabetics-22.9%, non-diabetics-8.6% Urban: diabetics-36.7% , non-diabetics-13.7%).

Table 4: Knowledge of Study Subjects Regarding Management and Complications of Diabetes

Questions	Rural (N=475)		Urban (N=475)	
	Diabetic (N=35) n(%)	**Non- Diabetic (N=440) n(%)**	**Diabetic (N=60) n(%)**	**Non- Diabetic (N=415) n(%)**
Treatment of DM is there	26(74.3)	369(83.9)	55(91.7)	384(92.5)
Diabetes can be prevented/controlled by lifestyle measures	33(94.3)	409(92.5)	60(100)	411(99.0)
Lifestyle measures to prevent Diabetes.				
1. Diet modification	32(91.4)	398(90.5)	60(100)	410(98.8)
2. Increasing physical activity	30(85.7)	303(68.9)	56(93.3)	379(91.3)
3. Decreasing weight	26(74.3)	264(60.0)	50(83.3)	362(87.2)
Knowledge about complications of Diabetes	25(71.4)	183(41.6)	39(65.0)	235(56.6)
Complications of Diabetes				
1. Eye	23(65.7)	146(33.2)	36(60.0)	197(47.5)
2. Kidney	08(22.9)	38(8.6)	22(36.7)	57(13.7)
3. Foot gangrene	01(2.9)	09(2.1)	18(30.0)	26(6.3)
4. Delayed wound healing	02(5.7)	30(6.8)	02(3.3)	30(7.2)
5. Heart	00	00	00	02(0.5)
6. Leg weakness	00	00	01(1.7)	03(0.7)
7. Painful joints	00	00	00	03(0.7)

As regards preventive practices adopted by diabetics (Table 5),It was observed that, out of 95 diabetics, 69.5% of diabetic subjects were using medication regularly, 68.4% were using regular footwear, 61.1% got their blood glucose monitored regularly, 55.8% made specific dietary changes, 34.7% consulted the physician regularly and 27.4% of diabetic subjects were doing regular exercise. Only 2.1% diabetic subjects had stopped smoking/alcohol intake and only 1.1% of diabetic subjects were making efforts to control weight.

TABLE 5: PRACTICES ADOPTED BY DIABETIC SUBJECTS

S.No.	Practices* (N=95)	Total N (%)
1.	Regular medication	66 (69.5)
2.	Regular footwear	65 (68.4)
3.	Regular blood glucose monitoring	58 (61.1)
4.	Made specific dietary changes	53 (55.8)
5.	Consult physician regularly	33 (34.7)
6.	Regular exercise	26 (27.4)
7.	Avoid smoking or alcohol intake	02 (2.1)
8.	Efforts to control weight	01 (1.1)

Discussion

The prevalence of diabetes in India is increasing at an alarming rate. Different nation-wide studieshave shown high prevalence of diabetes and IGT with gross regional variations.[10,11] The so called "Asian Indian Phenotype" makes Indians more prone to diabetes.[12] The prevalence of Diabetes was estimated to be 10% in the present study.

Studies from India have reported prevalence from 13 % to 25 %,[13,14,15] which is comparable to the present study results. Studies from other Asian nations such as Thailand and Hong Kong have reported prevalence rates of 14% and 15%, respectively.[16,17]

In our study, nearly 100% study subjects reported that they knew about a condition called Diabetes and were aware that it is a non-infectious disease and can occur at any age. Majority of respondentsreported increased frequency of urination as the commonest symptom of Diabetes Mellitus. Similar findings have been reported by Deepa Mohan *et al*in Chennai.[18]

The most common risk factor identified by respondents was higher intake of sweets/sugar, but knowledge regarding other risk factors was poor.It was worrisome to note that sedentary habits were recognised as a risk factor only by34.3% of diabetics in rural areas and 53.3% of diabetics in urban areas. Altering lifestyle is an important measure for prevention of Diabetes and therefore improving knowledge about the risk factors of Diabetes must receive urgent attention of policy makers and healthcare planners.

Awareness level about management of Diabetes by medication and lifestyle measures was observed to be relatively good, though knowledge about complications of Diabetes Mellitus were observed to be quite poor. Deepa Mohan *et al*. in Chennai observed that even among self-reported diabetic subjects, knowledge about Diabetes including awareness of complications of Diabetes was poor (40.6%).[18]

The paramount importance of Community participation at this stage cannot be overemphasised and argued, as it is perhaps most applicable to prevention of Diabetes mellitus. Being Multifactorial diabetes is closely linked to the behaviour, customs and lifestyle of the community, not just through their involvement but also through their ownership and proactive role.

Making the community aware about the existence of diabetes, its risk factors,consequences and how it can be prevented and controlled is absolutely essential.

Self-care and Practices related to diabetes prevention among diabetics revealed thatout of 95 diabetics, only 69.5% of diabetic subjects were using medication regularly, 68.4% were using regular footwear, 61.1% got their blood glucose monitored regularly, 55.8% made specific dietary changes, 34.7% consulted the physician regularly and 27.4% of diabetic subjects were doing regular exercise. Only 2.1% diabetic subjects had stopped smoking/alcohol intake and only 1.1% of diabetic subjects were making efforts to control weight. Studies by Kaur and others in Chandigarh observed that 63.3% of them were poor in practicing foot care through regular washing &monitoring of blood sugar was infrequent (46.7%).[19]

American Diabetic Association has defined self-management education as the process of providing the person with diabetes the knowledge and skill that is needed to perform self-care, manage crises and make life style changes. The onus of achieving such stated self-care, patients and physicians need to work together

Conclusion

In conclusion, this study reflects an urgent need for increasing Diabetes awareness activities in the form of mass campaigns in both urban and rural areas.Media and Non Government Organisations should come forward to take up this daunting task of removing misbelieves, ignorance and instituting diabetes preventive measures in the community as per the social determinants of the region.

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