



## Study of diabetes in Dharwad- an urban area in India

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### Abstract

The prevalence of diabetes mellitus (DM) is reaching epidemic levels worldwide. The World Health Organization (WHO) has estimated that the number of people with DM is expected to rise from 171million in 2000 to 366 million in 2030, as a result of population ageing and urbanization. Majority of the people with DM in developing countries are in productive age group of 45 to 64 years. Keeping the above concept in mind, a cross sectional study was carried out in the Urban Health Training Centre to assess the socio demographic profile and its association with the risk factors of diabetes. Data was collected on a pre-designed and pre-tested questionnaire among the patients attending the urban centre OPD. Chi-square test and other appropriate statistical tests were used for analysis of the data. Significant association was found between family history, physical exercise and BMI with occurrence of diabetes. Life style and behaviour have significant association with diabetes.

**Keywords:** Diabetes, Epidemiology, India

### Introduction

Diabetes mellitus (DM) is a chronic metabolic disease (Mehta *et al.*, 2006). Diabetes has led to increased morbidity and mortality (Adibah *et al.*, 1998). The prevalence of diabetes is reaching epidemic levels worldwide (Amos *et al.*, 1997; Zimmet *et al.*, 2001), more so in developing countries like India due to rapid urbanization (Grol *et al.*, 1997; Ramachandran *et al.*, 2004). India ranks first in diabetes mellitus and will continue to do so even in 2025.

The World Health Organization (WHO) has estimated that the number of people with DM is expected to rise from 171million in 2000 to 366 million in 2030, as a result of population ageing and urbanisation (Wild *et al.*, 2004). Urban and even western lifestyles, through faulty dietary habits, have contributed to a rise in levels of overweight and obesity increasing the risk of diabetes. Individuals with family history of developing diabetes are at higher risk of developing the condition but lifestyle modification can reduce the risk (Shaten *et al.*, 1993; Meigs *et al.*, 2000).

Majority of the people with DM in developing countries are in age group of 45 to 64 years. Multiple studies have shown that lifestyle behaviours such as regular physical activities and healthy dietary choices are associated with lower risk of developing diabetes (Sergeant *et al.*, 2000). Besides their reduced productivity, diabetes further imposes a high economic burden in terms of health care expenditure, lost productivity and forgone economic growth (Ping Zhang *et al.*, 2009). The total direct cost of management of diabetes has doubled in 2005 compared to 1998 levels (Ramachandran *et al.*, 2004).

Individuals often adjust their lifestyle within the frame work of his cultural influences, economic status, knowledge and resources regardless of clinical

recommendations. Knowledge is the greatest weapon in fight against diabetes. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease. Keeping the above said in mind, this study aims to examine the general understanding and perceived vulnerability of diabetes mellitus and the differences in life style and health promotive behaviour of those with and without diabetes mellitus.

### Materials and methods

A cross-sectional study was carried out in the Urban Field Practice Area, of the Department of Community Medicine, SDMCMS & Hospital, Dharwad. Data was collected on a pre-designed and pre-tested questionnaire among the patients attending the OPD of urban health training centre. Questionnaire was divided into two parts. Part-1 included Socio-demographic profile; Part-2 included risk factors influencing diabetes. All in the age group of 30-65 years were included in the study. The study was carried out for a period of one month. A total of 104 subjects who satisfied the above said criteria and consented to participate in this study were included. Chi-square test and other appropriate statistical tests were used for analysis of the data.

### Results

A total of 104 subjects in the age group of 30-65 years were studied. Table 1 shows that majority 37(35.6%) of them were in the age group of 30-39 years and all of them were non diabetic. 7 of 30(23.3%) in the age group of 40-49 years were diabetic. Also it was found that as the age increased the number of diabetics also increased, which was found to be statistically significant. Majority of study subjects were females [68/104 (65.4%)], 8 of 36 (22.2%) males had diabetes. Most of our study subjects were literates 86.5% (90/104). Among literates, 17.8% (16/104) were diabetic. Table 2 shows the effect of



Table 1. Socio-demographic factors vs. diabetes

Age Group	Diabetes			Fisher's exact test P < 0.001
	Yes	No	Total	
<50	7 (10.4%)	60 (89.6%)	67 (64.4%)	
50-59	3(15.8%)	16(84.2%)	19(18.3%)	
>60	8(44.4%)	10 (55.6%)	18(17.3%)	
Sex	Diabetes			$\chi^2 = 0.93$ P =0.34 at df=1
	Yes	No	Total	
Female	10(14.7%)	58(85.3%)	68(65.4%)	
Male	8(22.2%)	28(77.8%)	36(34.6%)	
Education	Diabetes			Fisher's exact test P=1
	Yes	No	Total	
Literate	16(17.8%)	74(82.2%)	90(86.5%)	
Illiterate	2(14.2%)	12(85.8%)	14(13.5%)	
TOTAL	18(17.3%)	86(82.7%)	104(100.0%)	

some of the Non-Modifiable and Modifiable risk factors on diabetes. Association was found between 17(51.52%) of our study subjects who were diabetic and gave family history of diabetes.

Of the 58(55.8%) who performed physical exercise, 52(89.66%) were non-diabetic and was found to be statistically significant. The relative risk is 0.33. This means that people who did not do physical exercises were three times as at risk of developing diabetes compared to those who did physical exercises. Number needed to treat (NNT) is 8.67 which mean if approximately 9 people can be encouraged to adopt physical exercises; one incidence of diabetes can be reduced. There was no association between consumption of tobacco and alcohol on the disease status in our study subjects. There were 41 (39.4%) subjects who had

abnormal BMI; of these 16(39.02%) were diabetic and this was found to be statistically significant. The relative risk of abnormal BMI was 12; this means that people with abnormal BMI are 12 times as at risk of developing DM as people with normal BMI. The Number needed to harm (NNH) of abnormal BMI is 2.56; therefore for every 3 people with abnormal BMI, there would be one additional person with diabetes.

#### Discussion

In our study, majority of subjects were females 65.4% (68/104) and in the age of 30-49 years (65%). This was similar to the study conducted by Ramchandran *et al.* (2004). The literacy rate in our study subjects was high (86.5%). Similar literacy rate (64%) was reported in another study (Viral Shah *et al.*, 2009). Our study showed the prevalence of diabetes to be 17.3%. This was much higher than that estimated for the Indian urban population which is 4 - 11.6% (Park, 2011).

In our study, among diabetics, women accounted for about 60% (10/18). It differed from the earlier estimate that prevalence of diabetes was more amongst males (Ramachandran *et al.*, 2004). In our study the overall prevalence of diabetes was 17.3%, and the prevalence increased as age advanced. Similar results were seen in a house to house survey carried out in New Delhi, the peak prevalence was in the age group of 60-65 (Verma, 1986).

Our study showed among (55.8%) subjects doing regular physical exercise, only 10.34% (6/58) had diabetes unlike the study carried out by in Singapore (Lai Yin Wong & Matthias, 2009). Our study did not show any significant association between occurrence of diabetes

Table 2. Effect of non-modifiable and modifiable risk factors on diabetes

Family history	Diabetes			$\chi^2 = 39.2$ P < 0.001 at df=1
	Yes	No	Total	
Yes	17(51.52%)	16(48.48%)	33(31.7%)	
No	1(1.40%)	70(98.60%)	71 (68.3%)	
Physical Exercise	Diabetes			$\chi^2 = 4.4$ P =0.03 at df=1
	Yes	No	Total	
Yes	6 (10.34%)	52(89.66%)	58 (55.8%)	
No	12(26.08%)	34(73.92%)	46 (44.2%)	
Tobacco	Diabetes			$\chi^2 = 0.59$ P =0.49 at df=1
	Yes	No	Total	
Yes	4(12.90%)	27(87.10%)	31 (29.8%)	
No	14(19.18%)	59(80.82%)	73 (70.2%)	
Alcohol	Diabetes			$\chi^2 = 0.05$ P < 0.82 at df=1
	Yes	No	Total	
Yes	1 (14.28%)	6 (85.72%)	7 (6.7%)	
No	17(17.52%)	80(82.48%)	97 (93.3%)	
BMI	Diabetes			$\chi^2 = 22.30$ P < 0.001 at df=1
	Yes	No	Total	
Normal	2 (3.18%)	61(96.82%)	63 (60.6%)	
Abnormal	16(39.02%)	25(60.98%)	41 (39.4%)	
Total	18 (17.3%)	86 (82.7%)	104 (100%)	

and habits like tobacco consumption and alcohol. Similar results were seen in study carried out by Lai Yin Wong and Matthias (2009). A family history was present in 94% of the diabetics (17/18) and association between diabetes and family history was found statistically significant ( $p < 0.001$ ). This finding was similar to the study done by Ramachandran *et al.* (2004). Abnormal body mass index (BMI) was found in 41/104 (39.4%) and a significant association was found between high BMI and diabetes unlike earlier study which did not show significant association (Ramachandran *et al.*, 2004).

### Conclusion

The prevalence of diabetes increased as age advanced. The findings were consistent with other studies. There was statistically significant association between family history and diabetes. Also high BMI and decreased physical exercise was found to have significant association with diabetes. Alcohol and smoking did not have significant association with occurrence of diabetes. The public must be encouraged to adopt healthy lifestyle like to quit smoking, increase physical activity and reduce alcohol consumption. Knowledge about diabetes mellitus is a prerequisite for individuals and communities to increase awareness and to take self-action in adopting control measures against them.

### Acknowledgement

We thank Dr. J.V. Chowti, Principal and HOD, Department of Community Medicine, SDM College of Medical Sciences and Hospital for his constant support. We also thank all the interns posted during the time of the study for their support in carrying out the study. We thank our participants for sparing their valuable time.

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