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## Patient's Knowledge about Diabetes Mellitus and Its Co-morbidities: An Observational Study

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*Received: 01-08-2017 / Revised Accepted: 19-09-2017 / Published: 29-09-2017*

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### ABSTRACT

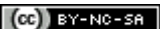
An Indian survey in both rural and urban areas was conducted to map the risk factors for diabetes and the prevalence of complications of diabetes such as CVD and diabetic nephropathy and amputation in Indian patients with diabetes. A rural preponderance of diabetes was observed (53.97% vs 34.63%). 79.08% were unaware of the cause of diabetes. 32.61% patients were aware that they had dyslipidemia while 9.67% patients were ignorant about their lipid status. 63.49% patients were aware that diabetes caused eye problems and 59.02% patients were aware that diabetes is associated with renal damage. 86% patients knew that diabetes increases the risk of CVD. 88.31% patients were aware that diabetes could and must be controlled, yet 93% of the respondents were not taking the appropriate treatment. The study emphasizes the need for improving the knowledge and awareness both among the general population as well as diabetic patients so that India can proudly renounce the title of a high burden diabetes country.

**Key words:** Patient awareness; Perceptions; Diabetes Mellitus; Co-morbid disorders

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**How to Cite this Article:** Sanjiv Indurkar, Mahesh Kavathekar and Deepak D. Mariguddi. Patient's Knowledge about Diabetes Mellitus and Its Co-morbidities: An Observational Study. World J Pharm Sci 2017; 5(10): 49-55.

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## INTRODUCTION

India has around 69.2 million patients diagnosed with diabetes.<sup>1</sup> The Indian Council of Medical Research India Diabetes Study (ICMR-INDIAB study) has projected that there would be an increase in diabetes patients to about 101.2 million by 2030.<sup>2,3</sup> There is a paucity of epidemiological studies from India assessing the level of awareness of diabetes in the Indian population<sup>4</sup>. The wide disparity in lifestyles, food habits, work profile, physical activity implies that there may be disparities in patient prevalence and demographics in diabetic patients in the urban and rural area in the real life setting in India.

Secondly, the disparities in the level of literacy, education and patient awareness regarding diabetes, risk factors for diabetes and treatment is expected to differ from the Western population. Patient perceptions and awareness are known to impact prevalence and treatment outcomes of diabetes. Mapping the perception, level of awareness and diabetes education in the real life setting was done through a survey of the population of patients with diabetes using a questionnaire.

The survey was aimed at additionally mapping the risk factors such as dyslipidemia and the prevalence of complications of diabetes such as CVD and diabetic nephropathy and amputation in Indian patients with diabetes.

The impact of this data on identifying the gaps in patient awareness, education and treatment could help improve survival and the quality of life in Indian patients with diabetes

## METHODOLOGY

A simple questionnaire was used for the survey carried out at a single center. The survey questionnaire (Table 1,2,3) was given to the adult males and females in the general population and to patients of diabetes attending the clinics of physicians, diabetologists and general physicians in India. The patients / population for the survey were adults in the age group of 18 to 75 years. The variables used in the survey were taken from those identified in literature regarding health literacy, age; gender; country of birth; educational achievement; employment status; location, based on rural, urban areas, economic status, the presence of other comorbidities and self-reported awareness of diabetes.

The data of 693 patients was analyzed and mapping of lifestyles, food habits, work profile, physical activity, disease awareness was done. (Table 4).

### Eligibility criteria for answering the questionnaire (any one of the following conditions)

- 1) Patient should be diabetic
- 2) Patient should have high cholesterol
- 3) Patient should be taking an anticoagulant

**Determining awareness:** The physician's assessment of their patients' diabetes was determined and obtained from the patient records. Patients were deemed 'aware' if they reported a condition consistent with their records or prescription papers.

Patients who were unsure or reported not having the condition in their physicians' records were called 'unaware'. Patients who reported having a condition contrary to their physician's assessment (using contemporaneous laboratory investigations) were excluded, leaving a dichotomy between 'aware' and 'unaware' patients (Table 2). If the patients did not understand medical terminology for the condition used in the questionnaire, their responses to subsequent questions about the rationale for taking the prescribed medication was considered. In case responses to subsequent questions indicated understanding of the condition, they were deemed 'aware'.

## RESULTS

Patients from both rural and urban areas were included in the study. 693 patients were included in the study. Contrary to expectations, a rural preponderance of diabetes was observed (53.97% vs 34.63%). A preponderance of diabetes was observed in males in both the urban as well as rural population, probably due to more patients were from rural area visited this particular centre [Rural Vs Urban population is 374 Vs 240 respectively] (Table 4). Type 2 diabetes found to be the most common type of diabetes prevalent (92.64% vs 0.87%) in this study. The highest prevalence of type 2 diabetes was observed in the age group of 31 to 60 years (Table 2). Most of the respondents were educated. Only 1.59% of patients had no formal education. Diabetes was observed to affect both the employed as well as unemployed patients (Table 4).

The key characteristics of responding participants are depicted in Table 4. The response to the questionnaire to assess the patient awareness about diabetes indicated that 79.08% did not know the cause of diabetes while 5.19% patients believed that an excess of insulin was the cause of diabetes. (Table 5)

32.61% patients were aware that they had dyslipidemia while 9.67% patients did not know their lipid status. (Table 5)

63.49% patients were aware that diabetes caused reported eye problems and 59.02% patients were aware that diabetes is associated with causing renal damage. 86% patients knew that diabetes increases the risk of CVD. 88.31% patients were aware that diabetes could and must be controlled yet, 93% of the respondents were not taking the appropriate treatment. (Table 5).

**DISCUSSION**

The current survey indicated a rural- urban disparity which was probably due to the fact that more patients from the rural area visited the centre [Rural Vs Urban population: 374 Vs 240 respectively]. These findings are contrary to expectations that risk factors for diabetes (obesity, smoking, sedentary life <sup>5</sup>are more prevalent in the urban areas and hence the urban area would have a higher prevalence of diabetes. Earlier it was believed that migration into urban areas is associated with increase in obesity because migrants eventually adopt urban lifestyles that put them at similar risk to the urban population .But the current data is indicative of a higher prevalence of diabetes in the rural areas.<sup>6</sup> But this disparity may be explained by the disparities in economic status, health care facilities, education and general unawareness regarding health implications of diabetes.

It is essential that all the health care stakeholders i.e. the government health agencies, the physicians in private/Government practice and the pharmaceutical industry join hands and make aggressive efforts to improve patients awareness about the risk factors of diabetes and about diabetes itself and its complications .The increasing prevalence of obesity in adolescents makes it imperative to begin health education and awareness of diabetes in school children so that the message of addressing the risk factors of diabetes reaches the parents as well. The need for early lifestyle

modifications such as healthy foods, adequate exercise, weight control measures must be explained to adolescents and adults across India. Education plays a key role in improving the compliance to treatment and outcomes of treatment.

There is a paucity of data from India regarding the awareness of the general population and patients regarding diabetes , its risk factors and the complications of diabetes.<sup>3, 7,8</sup> Not surprisingly the level of awareness is poor in rural areas.. This indicates the urgent need for conducting large scale diabetes awareness and education programs.<sup>3,7,9,10,11,12</sup>

Obesity is considered to be the new age epidemic.<sup>13</sup> But today, obesity and diabetes must be considered the twin epidemics which are increasing in prevalence in the Indian population. The increased intake of refined foods and low fibre intake may be risk factors for obesity. With educational programs, we may see an early diagnosis of diabetes and early implementation of lifestyle measures and institution of appropriate treatment. This can help reduce the burden of complications of diabetes which in turn results in good quality of life in patients with diabetes.

This study emphasizes the need for comprehensive diabetes education to be initiated through awareness programs. Education regarding the risk factors of diabetes, complications of diabetes, lifestyle modification such as diet control, physical activity, regular checkups and screening will help in better control of diabetes and reduce the morbidity due to diabetes complications <sup>14</sup>

This study provides a snapshot of prevailing unawareness about diabetes in both urban and rural areas of India. The study emphasizes the need for improving the knowledge and awareness both among the general population as well as diabetic patients so that India can proudly renounce the categorization of being a high burden diabetes country.

**Table 1: Patient Demography**

Name		
Age		
Gender	Male	Female
Habitat	Urban	
	Rural	
	Remote	
Education	Below SSC	
	Diploma	
	Graduate	
	Post Graduate	
	No formal education	

Employment	Private employed
	Government employed
	Self employed
	Agriculture
	Unemployed
	Others (please specify)

**Table 2:** Questionnaire: Patients self-reporting their chronic diseases

Do you have diabetes?		
Yes	No	NOT SURE
If yes, do you suffer from: (please tick one box only)		
Type 1 diabetes	Type 2 diabetes	Don't know
Diabetes is caused by: (please tick one box only)		
Lack of Insulin	Excess of Insulin	Don't know
Do you have hyperlipidaemia (high cholesterol)		
Yes	No	NOT SURE
Are you aware that diabetes causes eye problems		
Yes	No	Don't know
Are you aware that diabetes causes Kidney problems		
Yes	No	Don't know
Are you aware that diabetes may lead to amputation		
Yes	No	Don't know
Are you aware that diabetes causes heart diseases?		
Yes	No	Don't know
Are you aware that diabetes can be controlled?		
Yes	No	Don't know
Are you currently using any of the following treatments for your heart problem? (Please tick all that apply)		
Warfarin		
Heparin		
Aspirin		
Over-the-counter medication (please specify)		
Other (please specify)		

**Table 3:** For Medical Practitioner Only

Patient suffers from	
1)	Type 1 Diabetes
2)	Type 2 Diabetes
3)	High Cholesterol
4)	Is taking the following anticoagulants:
5)	Comorbidity 1
6)	Comorbidity 2
7)	Comorbidity 3
8)	Comorbidity 4

**Table 4 : Demographics**

	Number	%
<b><u>Demographics</u></b>		
Urban	240	34.63%
Rural	374	53.97%
Urban Male	142	20.49%
Rural Male	230	33.19%
Total Male	391	56.42%
Urban Female	94	13.56%
Rural Female	137	19.77%
Total Female	248	35.79%
<b>Total Type1</b>	6	0.87%
<b>Total Type2</b>	642	92.64%
<b>% of diabetics in age 1-30</b>	10	1.44%
<b>% of diabetics in age 31-60</b>	470	67.82%
<b>% of diabetics of age &gt;60</b>	170	24.53%
<b>Education</b>		
No Formal Education	11	1.59%
Below SSC	232	33.48%
Diploma	34	4.91%
Graduate	208	30.01%
Post Graduate	7	1.01%
<b>Employment</b>		
Agriculture	147	21.21%
Government Employed	7	1.01%
Self Employed	162	23.38%
Unemployed	175	25.25%

Table 5: Questionnaire response

-	Number	%
<b><u>Cause</u></b>		
Don'T Know	548	79.08%
Excess Of Insulin	36	5.19%
<b><u>Hyperlipidaemia</u></b>		
Yes	226	32.61%
No	348	50.22%
Don'T Know	0	0.00%
Not Sure	67	9.67%
<b><u>Eye problem</u></b>		
Yes	440	63.49%
No	166	23.95%
Don'T Know	43	6.20%
Not Sure	0	0.00%
<b><u>Kidney</u></b>		
Yes	409	59.02%
No	188	27.13%
Don'T Know	52	7.50%
Not Sure	0	0.00%
<b><u>Amputation</u></b>		
Yes	282	40.69%
No	260	37.52%
Don'T Know	104	15.01%
Not Sure	0	0.00%
<b><u>Heart</u></b>		
Yes	598	86.29%
No	36	5.19%
Don'T Know	15	2.16%
Not Sure	0	0.00%
<b><u>Control</u></b>		
Yes	612	88.31%
No	27	3.90%
Don'T Know	1	0.14%
Not Sure	0	0.00%
<b><u>Treatment</u></b>		
Yes	4	0.58%
No	645	93.07%

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