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PREVALENCE OF DIABETES MELLITUS IN URBAN POPULATION OF AHMADABAD CITY, GUJARAT

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ABSTRACT

Background: India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world". The number of people with diabetes in India currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. Rapid epidemiological transition associated with higher prevalence of diabetes in the urban population.

Objectives: To find out prevalence of diabetes mellitus among urban population of Ahmedabad city.

Materials and Methods: A community based cross sectional study was conducted in Ahmedabad city by house to house survey.

Results: Prevalence of diabetes in Ahmedabad City is 7.33%. Majority of the study population (53.64%) was between 45-60 years. Among diabetic population 37.37% housewives and 16.36% were having government job.

Conclusions: There is a large heterogeneity of diabetes prevalence within urban populations in India. There are few community based studies done in Ahmedabad city for prevalence of diabetes. It is important to have region-specific prevalence data of diabetes so that appropriate

Keywords: Diabetes Mellitus, Urban, Occupation

INTRODUCTION

"In every country and in every community worldwide, we are losing the battle against this cruel and deadly disease" said Jean Claude Mbanya, President of the International Diabetes Federation (IDF).New figures indicate that the number of people living with diabetes is expected to rise from 366 million in 2011 to 552 million by 2030, if no urgent action is taken. This equates to approximately three new cases every ten seconds or almost ten million per year. IDF also estimates that as many as 183 million people are unaware that they have diabetes [1]

India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "**diabetes capital of the world**". According to the Diabetes Atlas 2006 published by the International Diabetes Federation, the number of people with diabetes in India currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. The so called "Asian Indian Phenotype" refers to certain unique clinical and biochemical abnormalities in Indians which include increased insulin resistance, greater abdominal adiposity i.e. higher waist circumference despite lower body mass index. This phenotype makes Asian Indians more prone to diabetes. However,

the primary driver of the epidemic of diabetes is the rapid epidemiological transition associated with changes in dietary patterns and decreased physical activity as evident from the higher prevalence of diabetes in the urban population. [2]

Gujarat is having the second highest number of diabetics in the country after Tamil Nadu. Though no exact figures were available for diabetics in the state, their number might be around 10 per cent of the total population that is close to 50 lakh. In Ahmadabad alone, the number could be around four to five lakh, 14 out of every 100 people are diabetic in the country and their numbers were only increasing.[3] There are few community based studies done in Ahmedabad city for prevalence of diabetes. It is important to have region-specific prevalence data of diabetes so that appropriate public health measures can be initiated by public policymakers and supported by all those concerned. So this study was conducted to find out prevalence of diabetes mellitus among urban population of Ahmedabad city.

MATERIALS AND METHODS:

A community based cross sectional study was conducted in Ahmedabad city by house to house survey from duration March 2009-April 2010. Estimated sample size for survey was **2905** (based on sample size formula $4d (1-d)/l^2$ taking 12.1% prevalence [4] and 10% error).Thus final sample size of 3000 population was taken as study population. Established/Known cases of diabetes of all age groups were taken as study group.we had defined Established/Known case of diabetes was "The person who knows he/she is having diabetes and he/she is taking anti diabetic drugs or having medical reports suggesting diabetes".

Ahmedabad city is divided in six zones named East, West, North, South, Central and New West. Each zone is further divided into 9-11 wards. And each ward is further divided into areas. From each zone we had selected one ward randomly with lottery method and from each ward we had selected one area randomly with lottery method (East zone-Bapunagar, West Zone - Sabarmati, North Zone - Asarwa, South Zone - Isanpur, Central Zone - Girdharnagar and New West Zone - Vastrapur). From selected area we have visited the anganwadi worker and collected list of houses in that particular area. After that we have selected one house with random table

method. It was decided to take 500 population from each zone for data collection to reach the desired sample size. The data were collected from each person of every selected house.. Then the next houses were visited till we reached desired 500 population in each ward.

In each house we have asked for symptoms suggesting diabetes or having diabetes. Those who knew their status about diabetes were asked for further questioners and all those who have symptoms suggesting diabetes referred to diabetic clinic at civil hospital Ahmadabad. After one week we have taken follow up of the same person to know their status about diabetes and to ask further questioners. In this way we have tried to include submerged portion of the community for this iceberg phenomena for diabetes. Rest of the family members were educated about adoption of healthy life style.

A pre-designed and pre-tested Performa was used to collect baseline data by house to house visits. Informed consent was taken before the initiation of survey. After The consent questions were asked in local language(Gujarati) and then they were recorded accordingly. Analysis was done in Epi.Info version 3.5. Chi square test was used to test the significance.

RESULTS

A total of 3000 population was interviewed during the study, among them 44.20% were males and 55.80% were females. Out of them 220 (7.33%) persons was established / known case of diabetes mellitus, so overall prevalence of diabetes in Ahmedabad City is 7.33%. (Table-1).The prevalence among male was 7.24% and among female was 7.40%.No statistical difference was found between male and female for the prevalence. The prevalence among both sex was almost equal.

Table 1: Prevalence of Diabetes among the population of Ahmedabad City

Population	Male (n=1326)(%)	Female (n=1674)(%)	Total (n=3000)(%)
Diabetic	96(07.24)	124(07.40)	220(7.33)
Non diabetic	1230(92.76)	1550(92.60)	2780(92.67)
P value 0.916			

Among the 220 diabetic population, 12 patient reported diabetes in the follow up visits, they contributed 5.4% of the total diabetic population.

Majority of the study population (53.64%) was between 45-60 years. Mean age for male study population was 50.60 years and for female it was 50.75 years. Out of 220 studied population 64.09% population was Hindu, 67.73% married and 36.82% studied up to primary level. Among the study population, 37.37% were housewives and 16.36% were having government job. The gender difference between male and female was found highly significant for both the educational status and occupation or working status. (Table-2)

Table 2 Demographic Detail of Studied Diabetic Population in the Ahmedabad

Demographic Variable	Male (n=96)(%)	Female (n=124)(%)	Total (n=220) (%)	P value
Age (In years)				
0 – 15	04 (04.17)	00 (00.00)	04 (01.82)	0.042
15 – 30	09 (09.38)	17 (13.17)	26 (11.82)	
30 – 45	12 (12.50)	18 (14.52)	30 (13.64)	
45 – 60	56 (58.33)	62 (50.00)	118 (53.64)	
60 – 75	13 (13.54)	27 (21.77)	40 (18.18)	
75 – 90	02 (02.08)	00 (00.00)	02 (00.91)	
Religion				
Hindu	56 (58.33)	85 (68.55)	141 (64.09)	0.113
Muslim	13 (13.54)	18 (14.52)	31 (14.09)	
Others*	27 (28.13)	21 (16.94)	48 (21.82)	
Marital Status				
Married	67 (69.17)	82 (66.13)	149 (67.73)	0.224
Unmarried	11 (11.46)	13 (10.48)	24 (10.91)	
Widow	13 (13.54)	27 (21.77)	40 (18.18)	
Divorcee	05 (05.21)	02 (01.61)	07 (03.18)	
Education				
Illiterate	08 (08.33)	40(32.26)	48(21.82)	<0.001
Primary	37 (38.54)	44(35.48)	81(36.82)	
Secondary	34(35.42)	14(11.29)	48(21.82)	
Higher secondary	2 (02.08)	6(04.84)	8(03.64)	
Graduate	11 (11.46)	12(11.46)	23(10.45)	
Postgraduate	4(04.17)	8(04.17)	12(05.45)	
Occupation				
Government job	21 (21.88)	15 (12.10)	36 (16.36)	<0.001
Private job	11 (11.46)	0 (00.00)	11 (05.00)	
Business	20 (20.83)	2 (01.61)	22 (10.00)	
Laborer	23 (23.96)	7 (05.65)	30 (13.64)	
Unemployed	2 (02.08)	0 (00.00)	2 (00.91)	
Retired	14 (14.58)	6 (04.84)	20 (09.09)	
Student	5 (05.21)	11 (08.87)	16 (07.27)	
Housewife	0 (00.00)	83 (66.94)	83 (37.37)	

* Sikh, Jain, Parsi etc.

DISCUSSION:

Community-based health surveillance data comprise a useful tool to measure the prevalence of diagnosed cases of diabetes mellitus within the Indian context. As we know the prevalence of diabetes is rising all over the world due to population growth, aging, urbanization and an increase of Obesity and physical inactivity. Diabetes mellitus is an important public health priority requiring urgent preventive action.

There is a large heterogeneity of diabetes prevalence within urban populations. Studies from various parts of urban India show that the prevalence of diabetes varies from 5.9 % to 19.5 %. [5] A study done in Puducherry shows the prevalence was 5.3% among males and 6.2% among females. [6] A community based study done in Ahmedabad by Nayak HK shows that prevalence of Type 2 diabetes was 13.8%. The sex-specific prevalence was 16.9% and 11.1% for males and females respectively. [7] Overall prevalence and sex specific prevalence is higher than our study. The study done by Mohan V et al, Urban rural differences in prevalence of self-reported diabetes in India, as part of the WHO-ICMR Indian NCD risk factor surveillance, has found the prevalence of self-reported diabetes in urban areas was 7.3% which is similar to our study. [8]

Among the total 220 diabetic population 5.4% patient reported diabetes in the follow up visits. This shows hidden cases in the community founded after diagnostic test. In a study done in UK crude prevalence rate of diabetes was 1.5%, however, use of the capture recapture- method gave a prevalence of 3.1% .Though method is different than our study but to look for non-captured or hidden cases in study will only re-flects the true prevalence of this ice-berg pheno-mena. [9]

In our study majority of population (53.64%) was between 45-60 years. But there was fall in the number of diabetics after the 60 years of age. This may be due to elderly people are less mobile and less reporting themselves at hospital for di-agnosis and also for the treatment.

We have founded that among the diabetic popu-lation housewives had more prevalence of di-abetes as compared to others (37.37%). Other studies have also reported higher numbers of the female participants in their studies [10,11] this may be because of more availability of females at home as compared to earning male members, because they were not present at home during the daytime.

LIMITATIONS OF THE STUDY

1. We did not consider design effect when we were doing study so this is the limitation of our study. 2. In spite of our best efforts we have missed some submerge cases of diabetes of the community. 3. We could not include any rapid diagnostic test or screening test to detect and confirm diabetes because of financial limitation.

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