

# A STUDY AND SURVEY ON PREVALANCE OF DIABETES IN AN URBAN SLUM POPULATION OF VYASARADI, CHENNAI, TAMILNADU, INDIA

Gajalakshmi G<sup>1</sup> & Felcy Anne Jen<sup>2</sup> & Kalaivani<sup>3</sup> & Ghousia Nisha<sup>4</sup>

<sup>1,2,3</sup>Post Graduate and Research Department of Zoology, Justice Basheer Ahmed Sayeed College for women, Chennai, TamilNadu, India.

<sup>4</sup>Assistant professor, Post Graduate and Research Department of Zoology, Justice Basheer Ahmed Sayeed College for women, Chennai, TamilNadu, India.

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## ABSTRACT

*The objective of this survey and data analysis is to determine the prevalence of diabetes and correlates such as family history and physical activity and to study their awareness rate. In the present study glucose levels of 100 members from an urban slum population was taken into account. A digital glucometer, Accu-check was used to determine the Random capillary blood glucose level. A digital weighing machine was used to determine the weight. A survey questionnaire is used to analyse the lifestyle and complications of diabetes. The result of this study reveals that out of 100 members (23 male and 77 female) 25% were diabetic, 8% were prediabetic and 67% were non-diabetic. Out of which only 31% of people were aware of diabetes and its complications.*

**Keywords:** Non-Communicable diseases, urban slum population, awareness, glucose level

## I. INTRODUCTION

The global prevalence of Non-Communicable diseases (NCD) dominated by diabetes is increasing with the greatest burden occurring in developed countries and it is projected that by the year 2020 NCDs' will surpass communicable diseases as a cause of death. (Murray and Lopez 1996). The world prevalence of diabetes among adults was projected at 6.4% in 2010 affecting 285 million adults (Shaw *et al.*, 2010) Low socio economic status including low education levels has been associated with diabetes mellitus (Shaw, 2010 & Ismail, 1999). A study in India among a poor urban slum population generally believed to have low risks of lifestyle diseases found a high prevalence of risk factors for NCD's (Anand *et al.*, 2007). Diabetes is one of the first diseases described with an Egyptian manuscript from c.1500 BCE mentioning "too great emptying of the urine." The term "diabetes or "to pass through" was first used in 250BC by the Greek Apollonius of Memphis. Type 1 and type 2 diabetes were identified as separate conditions for the first time by the Indian physicians Sushruta and Charaka in 400-500 CE with type 1 associated with youth and type 2 with obesity. Diabetes is of different types, of which two are more prevalent such as type 1 and type 2 diabetes. Other types of diabetes include, Gestational diabetes, Congenital Diabetes, Cystic fibrosis - related diabetes, Steroid diabetes, Monogenic diabetes.

This study aims to find out the prevalence of diabetes, its awareness rate and complications in an urban slum population.

## II. METHODOLOGY

### 2.1 Field survey:

An urban slum in Vyasarpadi - Chennai, the capital of Tamil Nadu, India was chosen as the study area. A camp was set in that area with required equipment for blood glucose test and survey. The study was conducted on 10<sup>th</sup> February 2018 with a team of 5 members between 10.00 A.M. to 1.00 P.M.

### 2.2 Determination of blood glucose level:

A random capillary blood sugar (RCBS) was recorded using a glucometer. Random glucose test (random blood glucose) is a blood sugar test taken from a non - fasting subject. This test, also called capillary blood glucose (CBG), assumes a recent meal and therefore has higher reference values than the fasting glucose test.

A small drop of blood obtained by pricking the skin with a lancet, is placed on a disposable test strip that the meter reads and uses to calculate the blood glucose level. The meter then displays the level in units of mg/dl or mmol/l.

A blood sugar level of less than 160 was listed under Non-diabetic, 160 - 200 was listed under pre-diabetic and >200 was listed under diabetic.

### 2.3 Survey questionnaire:

A questionnaire with 25 questions about physical activity, metabolic risk factors and complications of diabetes was prepared and used for the analysis of data. The questionnaire was filled with the consent of the respondents.

### III. RESULTS:

The results of the current study explain that out of 100 respondents, 25 were diabetic, 8 were pre-diabetic and 67 were non-diabetic. The members consisted of 77 female and 33 male. The age group, prevalence of diabetes and sex is depicted in table 1.

**TABLE 1**

**Table showing different age groups**

AGE GROUP	DIABETICS		PRE - DIABETICS		NON - DIABETICS	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
20-29	01	01	-	01	01	10
30-39	-	02	02	02	03	15
40-49	03	08	-	01	02	14
50-59	02	03	-	-	04	08
60-69	-	03	-	01	02	04
70-79	-	02	01	-	01	-
80-89	-	-	-	-	01	02
<b>TOTAL</b>	<b>6</b>	<b>19</b>	<b>3</b>	<b>5</b>	<b>14</b>	<b>53</b>

Out of 100 members, 30 % was aware of diabetes and majority of the population 70% was unaware of diabetes and its complications. (Table 2)

**TABLE 2**

**Table showing of awareness rate of people**

AGE GROUP	NO. OF PEOPLE AWARE	NO OF PEOPLE UNAWARE
20-29 Years	01	13
30-39 Years	03	21
40-49 Years	10	18
50-59 Years	08	09
60-69 Years	06	04
70-79 Years	02	02
80-89 Years	01	07
<b>TOTAL</b>	<b>30</b>	<b>70</b>

The risk factors included smoking and alcohol consumption habits. As anticipated, 52% of the overall respondents had a family history of diabetes of which 20% were diabetic, 4% were pre-diabetic and 28% were non-diabetic. Current cigarette smokers comprised of 7%, in which 3% were diabetic and 1% were pre-diabetic. 10% of the overall respondents were alcoholic of which 4% were diabetic, 1% were pre-diabetic. (Table 3)

**TABLE 3**

**Table showing risk factors of diabetes**

S.NO	RISK FACTORS	DIABETIC	PRE-DIABETIC	NON-DIABETIC
1	Family history	20	04	28
2	Smoking	03	01	03
3	Alcohol consumption	04	01	05

The complications differed from person to person. Out of 100 members, 14% of the female population experience irregular menstrual cycle, out of which 1% were diabetic. 69% of the people had eye problem, out of which 18% were diabetic and 6% were pre-diabetic. 71% people experienced pain and numbness in toes, out of which 21% were diabetic and 4% were non-diabetic. 22 % of people had skin infections, out of which 10% were diabetic. 6% of the members had kidney stone, out of which 2% were diabetic. 28% of people suffer from genital itching, out of which 9% were diabetic and 1% was pre-diabetic. The results explain that half of the diabetic population suffer from pain and numbness in toes, skin infection and eye problem as the major complication. Less than half of the diabetic population experience irregular menstrual cycle, kidney stone and genital itching. (Table 4)

**TABLE 4****Table showing complications of diabetes**

S.NO	COMPLICATIONS	TOTAL	DIABETIC	PRE-DIABETIC	NON-DIABETIC
1.	Irregular menstrual cycle	14	1	0	13
2.	Eye problem	69	18	6	45
3.	Pain and numbness in toes	71	21	4	46
4.	Skin infection	22	10	0	12
5.	Kidney stone	6	2	0	4
6.	Genital itching	28	9	1	18

#### IV. DISCUSSION

We set out this urban-slum population survey to determine the prevalence of diabetes and associated behavioural and metabolic risk factors in the largest growing segment of our urban population, a population deemed to be burdened with infectious diseases and under nutrition. The prevalence of diabetes increased with age. These slum residents are highly exposed to high level of behavioural risk factors such as cigarette smoking and harmful alcohol consumption. The occurrence of Diabetes Mellitus has been attributed to dietary patterns, low physical activity, cigarette smoking and low birth weight. A further important potential consequence of a high prevalence of diabetes among the urban high density poor is the association with communicable diseases, particularly tuberculosis and therefore HIV (Hall *et al.*, 1999-2011) In other parts of the diabetes world diabetes has been shown to be associated with a threefold increase risk of tuberculosis (Jeon& Murray 2008) and one in five cases of new smear positive tuberculosis in India has been attributed to diabetes (Stevenson *et al.*, 2007)

Urbanisation has been identified as the key driver of the evolving NCD epidemic in developing countries (Yusuf *et al.*, 2001) Identified lifestyle changes include decreased physical activity; increased smoking; increased alcohol intake. These are the behavioural risk factors for diabetes, which can lead to development of metabolic risk factors such as obesity. Since 2008 for the first time in human history, the majority of the world's population has lived in urban areas. (UNFPA, 2007)

In the present study the blood glucose level of 100 members from a urban slum population was taken into account, the reason to select an urban-slum population is to create awareness about life-style diseases. A high prevalence of diabetes in deprived communities has been documented and is most striking in middle age (Ismail *et al.*, 1999; Connolly *et al.*, 2000; Misra *et al.*, 2001) This study reveals that more than half of the population of this urban slum is unaware of diabetes and Non-Communicable diseases in general. To reduce the complications of diabetes, these populations should be educated about Non-Communicable diseases.

#### V. CONCLUSION

This study concludes that, this previously unstudied urban slum community has a high prevalence of diabetes and associated risk factors signalling a lack of access to care and low public awareness in a literate but poor population. Urban slum populations continue to grow faster than the National populations. Health strategies that focus on non-communicable diseases in this segment are generally lacking. Therefore, it is our recommendation that for this rapid expanding segment of our population policy makers need to focus their attention on strategies that address not just communicable disease but also non-communicable diseases.

In an average population of 100 members in an urban slum, 25% of the people are diabetic and 8% are pre- diabetic. Which means less than half of the population is prone to diabetes and its complications. These people are more prone to behavioural risk factors. And nearly half of the population had a family history of diabetes.

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