



## PREVALENCE AND DETERMINANTS OF DIABETES AMONG PEOPLE ATTENDING A MEDICAL CAMP AT THIRUVANANTHAPURAM, KERALA

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### ABSTRACT

**Background:** Diabetes is very common in Kerala. Early diagnosis and treatment can prevent complications.

**Objective:** This study aims to describe the proportion of hyperglycaemia and known risk factors of diabetes among adults who attended a screening camp at Kulathoor, Thiruvananthapuram.

**Methods:** A cross sectional study was conducted among 67 adults who attended a camp at Kulathoor, Trivandrum. Data on Age, gender, occupation, past history, family history, treatment, exercise, addictions, height, weight, BMI, GRBS was collected.

**Results:** Among 67 who had blood checkup, 22(32.83%) were detected to have hyperglycaemia. Among these, 20(29.85%) were known diabetics and 2(2.98%) were newly detected. Family history, insufficiency of exercise and substance abuse were more common among diabetics.

**Conclusion:** Medical camps should be promoted in the community to improve screening practices for Diabetes Mellitus

**KEYWORDS :** Diabetes, Hyperglycaemia, Risk factors, Kerala

### Introduction

India shelters the most number of people with diabetes mellitus worldwide. From 31 million in the year 2000, the number of persons with diabetes mellitus in India would register a 2.5 fold increase over the next 30 years so as to reach an alarming level of estimated 80 million by the year 2030.<sup>1</sup> The only published nationally representative study on burden of diabetes mellitus in India is Prevalence of Diabetes in India Study – PODIS (2002), a multi-centric study (49 urban and 59 rural centres) on 41,000 Indian people. PODIS has estimated the age and gender standardised prevalence of diabetes mellitus in India to be 3.3 percent.<sup>2</sup> The prevalence estimates ranged from 5.6 to 12.4 percent in urban area and 2.4 to 2.7 percent in rural area.<sup>3</sup> Kerala is the diabetes capital of India with a prevalence of diabetes as high as 20% double the national average of 8%.<sup>4</sup> In a large multi-center study involving nearly 20,000 subjects, the prevalence of diabetes in Thiruvananthapuram was 17% compared to 15% in Hyderabad and New Delhi, 4% in Nagpur and 3% in Dibrugarh.<sup>5</sup> Several studies from different parts of Kerala support the high prevalence of diabetes. One study from central Kerala reported a prevalence of diabetes at 20% and pre-diabetes at 11%.<sup>6</sup> Another study from southern Kerala, showed a wide urban-rural gradient in age-standardized (30-64 years) prevalence of diabetes indicating an important role of lifestyle factors. The prevalence was 17% in urban, 10% in the midland, 7% in the highland, and 4% in the coastal regions.<sup>7</sup>

Other studies have shown a prevalence of 11-19% in men and 15-22% in women with rural Keralites having paradoxically higher rates of diabetes than urban dwellers (Kerala Paradox). This is in sharp contrast to national data that shows the prevalence of diabetes to be double in urban areas than rural areas.<sup>8,9</sup>

The objectives of the study were to study the proportion of newly diagnosed Diabetes Mellitus among adults attending a camp at Kulathoor, Thiruvananthapuram and to study the risk factors associated with Diabetes Mellitus, among adults attending the camp.

### Materials and Methods

A cross sectional study was conducted among 67 adults who attended a camp at Kulathoor, Trivandrum. Data on Age, gender, occupation, past history, family history, treatment, exercise, addictions, height, weight, BMI, GRBS was collected. Data was collected using semi-structured questionnaire by interview and random blood glucose was estimated using a glucometer. The data collected from the study was entered into Microsoft Excel and statistical analysis was done using IBM SPSS Statistics. Categorical variables are expressed in percentages. The variables were

compared using Chi-square ( $\chi^2$ ) test. According to the p values, association was established. p-value of  $\leq 0.05$  was regarded as an association. Case control analysis was done and Odds ratio with 95% confidence intervals were estimated. Informed verbal consent from the subjects was obtained. Confidentiality of the subjects was ensured.

### Results

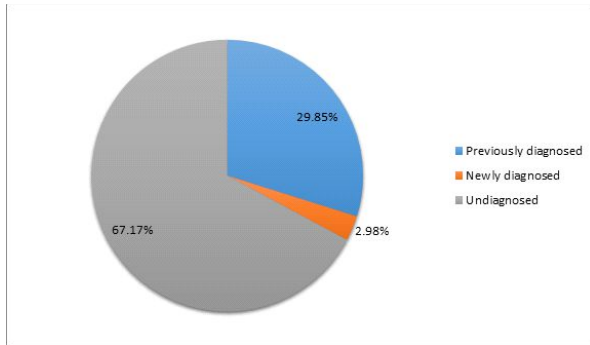
Socio-demographic data of study participants is given in table 1.

**Table 1 : The socio-demographic data of study participants**

Variable	Number (percentage)
<b>Age distribution of participants in years</b>	
40 years & below	12 (17.9%)
41-60 years	34 (50.7%)
More than 60years	21 (31.3%)
<b>Gender distribution</b>	
Male	25 (37.3%)
Female	42 (62.7%)
<b>Body Mass Index</b>	
Normal	20 (29.9%)
Overweight	12 (17.9%)
Obese	23 (34.3%)
Morbidly obese	12 (17.9%)
<b>Sufficiency of exercise</b>	
Sufficient exercise	17 (25.4%)
Insufficient exercise	50 (74.6%)
<b>Addictions</b>	
No addiction	53 (79.1%)
Alcohol consumers	5 (7.5%)
Smokers	4 (6%)
Both smoking & alcoholism	2 (3%)
Pan -chewers	3 (4.5%)
<b>Family history of Diabetes Mellitus</b>	
Positive family history	45 (62.69%)
No family history	25 (37.3%)
<b>Random Blood Glucose level</b>	
GRBS value < 200mg/dL	48 (71.6%)
GRBS value $\geq$ 200mg/dL.	19 (28.4)
<b>Mode of treatment among Diabetics</b>	
Oral hypoglycaemic drugs	12 (60%)
Insulin	6 (30%)
Diet modification	1 (5%)
No treatment	1 (5%)

**Random Blood Glucose level of participants**

Among subjects who were previously diagnosed with Diabetes Mellitus, 85% had GRBS value  $\geq 200$ mg/dL. Out of the study participants, 2.98% were newly diagnosed with diabetes mellitus. (fig 1)



**Figure 1: Classification of study participants based on random blood glucose level**

**Factors associated with Diabetes mellitus**

Chi-square test was done to find the variables associated with diabetes. Table 2 describes the factors found to be associated with diabetes among study participants.

**Table 2 : Factors associated with Diabetes mellitus among study participants**

Variable	Chi-square value	P value
Family history of Diabetes	5.253	0.022
Insufficient exercise	9.017	0.003
Substance Abuse	13.694	0.008

Case-control analysis of study variables revealed the following variables to be associated with increased risk of Diabetes mellitus (Table 3)

**Table 3: Risk factors associated with Diabetes Mellitus**

Variable	GRBS < 200mg/dL	GRBS $\geq 200$ mg/dL	Odds ratio (95% CI)	p-value
Family history of diabetes mellitus	26	16	4.51 (1.61 – 17.5)	0.022
Insufficient exercise	31	18	9.87 (1.21 – 80.5)	0.003
Substance Abuse	4	9	9.9 (2.5 – 38.7)	0.001

**Discussion**

According to the study, Prevalence of Type 2 Diabetes and Prediabetes in Neyyattinkara Taluk of South Kerala Diabetes,<sup>10</sup> Case Detection Rates were highest (76%) between 60 and 69 years. Lowest detection rate was between 30-39 years (50%). In our study, majority of the diabetic subjects were found to be  $>60$  years (40.91%). However, the proportion of diabetic subjects between 41-60 years was 40.91%.

According to The Framingham Heart Study,<sup>11</sup> metabolic risk factors partially mediated offspring type 2 diabetes risk conferred by parental diabetes to a similar magnitude as genetic risk. However, a substantial proportion of offspring diabetes risk associated with parental diabetes remains unexplained, suggesting that important familial influences on diabetes risk remain undiscovered. Our study showed that there is a positive association between family history and Diabetes Mellitus.

The study Diabetes and exercise,<sup>12</sup> showed that in type 2 diabetes, exercise may well be an important component of strategies for prevention and treatment. This is in agreement with our study conducted, which demonstrated a positive association between insufficiency of exercise and Diabetes Mellitus.

Another study, The Effect of Alcohol Consumption on Insulin Sensitivity and Glycemic Status: A Systematic Review and Meta-analysis of Intervention Studies<sup>13</sup> concluded that Alcohol consumption might improve insulin sensitivity among women but did not do so overall. Our study similarly found an association between substance abuse and Diabetes Mellitus.

**Conclusion**

Majority of the diabetic subjects were from the age groups of 41-60 years (40.91%) and above 60 years (40.91%). Most of the participants (62.69%) had a positive family history of diabetes. 2.98% subjects were newly diagnosed to have Diabetes Mellitus as a result of secondary screening. Positive family history, Insufficiency of exercise and Substance abuse were found to be risk factors associated with Diabetes Mellitus. Medical camps should be promoted in the community to improve screening practices for Diabetes Mellitus.

**Limitations**

Sample size was small. Prevalence of Diabetes Mellitus in whole of Kulathoor could not be determined, as this study was based on a camp approach. Most of the general associations have not been ascertained because of the limited sample size. The findings of this study does not necessarily reflect the rest of the population. Recall bias may have affected accuracy of the data.

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