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An epidemiology of prevalence of Type 2 Diabetes among the adult residents in Dakshina Kannada district.

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ABSTRACT

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 is around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. Study was done according to age, sex, food habits, religion,, socio-economic status and duration of diabetes. Detection of diabetes was done by estimation of fasting and post-prandial blood sugar as per WHO criteria. Overall diabetes detected was computed for the group 30-64 years which were then standardized according to an international standard population with age distribution. Our results show greater prevalence with regard to younger age, body mass index and sedentary lifestyle. The survey also shows the recent generation is more prone to Diabetes, probably duetothestress.

Keywords: Type2DiabetesMellitus,BodymassindexStress.

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INTRODUCTION

Diabetes mellitus comprises a group of common metabolic disorder that share the phenotype of hyperglycemia. It is caused by a complex interaction of genetics, environmental factors and lifestyle choices. Type 2 diabetes mellitus is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion and increased glucose production. Distinct genetic and metabolic defects in insulin action or secretion give rise to the common phenotype of hyperglycemia in type 2 diabetes mellitus. The chronic hyperglycaemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels [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 is 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, lower adiponectin and higher high sensitive C-reactive protein levels. This phenotype makes Asian Indians more prone to diabetes and premature coronary artery disease. 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]. The prevalence of diabetes is rapidly rising all over the globe at an alarming rate [3]. Nowhere is the diabetes epidemic more pronounced than in India as the World Health Organization (WHO) reports show that 32 million people had diabetes in the year 2000 [4]. The International Diabetes Federation (IDF) estimates the total number of diabetic subjects to be around 40.9 million in India and this is further set to rise to 69.9 million by the year 2025 [5].

A study of Chennai urban and rural epidemiology reported that, from 1989 to 2004, the prevalence of diabetes mellitus increased by 72.3 % [6]. With this background we wanted to estimate the prevalence of type 2 diabetes among adult residents in Dakshina Kannada district. Also describe the pattern of prevalence of Diabetes mellitus according to characteristics such as gender, age, religion and socio-economic status and also the relationship of diabetes with body mass index, diet and lifestyle.

MATERIALS AND METHODS

The study was carried out in and around Deralakatte, Mangalore, Karnataka state, India. The subjected were explained the purpose of the study and their consent was taken. Venous blood sample (about 5ml each) was collected from the subjects in the morning after an overnight fast and transferred to fluoride oxalate containers for estimating fasting blood glucose. Glucose concentration was determined spectrophotometrically using Glucose oxidase- peroxidase (GOD-POD) method within one hour of collection. Detection of diabetes was done by estimating fasting and post-prandial as per WHO criteria. Diabetic identified in

our survey were already known to be diabetic and those detected during survey. Detailed history was taken including their dietary habits and lifestyle. Information regarding age, sex religion, socio-economic status and duration of diabetes was also collected and pattern of distribution of diabetes in reference to these factors was assessed.

RESULTS

The present study involves the epidemiology of prevalence of type 2 diabetes among the adult residents in Dakshina Kannada district. The results were expressed in figure1-7. The prevalence of type 2 diabetes among the adult male residents in Dakshina Kannada district was found to be 57% whereas that of females was 43% (fig:1). The prevalence of type 2 diabetes among the adult overweight male residents in Dakshina Kannada district was found to be 62% whereas that of overweight females was 53% (fig:2). But the prevalence of type 2 diabetes among the adult obese male residents in Dakshina Kannada district was found to be 38% whereas that of adult obese females was 43% (fig:2). The prevalence of type 2 diabetes among the adult male residents of the age group of 35-44 years was found to be 13%, for the age group of 45-54 years was found to be 32%, for the age group of 55-64 years was found to be 38%, and for the age group of 65 years and above was found to be 117% (fig-3). With respect to religion, we found people belong to mainly three religions namely, Hindu, Christian and Muslim. The prevalence of type 2 diabetes among the adult Hindu residents in Dakshina Kannada district was found to be 31% whereas that of Christian and Muslim was 21% and 43% respectively (fig:4). The socioeconomic statuses of the residents of Dakshina Kannada district were grouped into Lower class, middle class and higher class respectively. The prevalence of type 2 diabetes among the adult lower class residents in Dakshina Kannada district was found to be 13% whereas that of middle class and higher class was 22% and 60% respectively (fig:5). The prevalence of type 2 diabetes with respect to the duration of the disease was also estimated. The prevalence of type 2 diabetes for the duration upto 5 years among the adult residents in Dakshina Kannada district was found to be 58% whereas that of adult patients upto the duration of 10 years,15 years and above 15 years were 18%,12% and 11% respectively(fig:6). The prevalence of type 2 diabetes with respect to the glycemic control of the disease was also estimated. The prevalence of type 2 diabetes for the glycemic level of 100-140 mg% among the adult residents in Dakshina Kannada district was found to be 6% whereas that of adult patients of glycemic level of 140-200 mg%,200-300mg% and above 300mg% and above was 32%,50% and 11% respectively(fig:7).

DISCUSSION

India has nearly 33 million diabetic subjects today, which is briefly contributed by the urban population. The scenario is changing rapidly due to socio-economic transition occurring in the rural areas also. Availability of improved modes of transport, and less strenuously as in the vicinity have resulted in decreased physical activities. Better economic conditions have produced changes in diet habits. The conditions are more favourable for expression of diabetes in the population, which already has a racial and genetic susceptibility of the disease. Recent epidemiological data show that the situations are similar throughout the country. Prediabetic conditions like impaired glucose tolerance and

impaired fasting glucose are also on the rise, indicating the possibility of further rise in the prevalence of diabetes [7].

According to the National Urban Diabetes Survey done by Ramachandran A, the prevalence at Bangalore was reported to be 12.4 % [8]. While the ICMR funded study by Ahuja MMS reported that the prevalence was 2.1 % in urban and 1.5 % in rural areas [9], a later study showed that the prevalence was three times higher among the urban (8.2%) compared to the rural population (2.4%) [10]. A study done in southern Kerala reported that the prevalence of diabetes was the highest in the urban (12.4%) areas, followed by the midland (8.1%), highland (5.8%) and coastal division (2.5%) [11]. A study by Rao PV et al reported that the prevalence of known diabetes was 6.1 per cent in individuals aged above 40 yr which was unexpectedly high at the time of the study for a rural area with low socio-economic status and decreased health awareness [12] . In our study we found that the subjects of higher socio-economic status have higher prevalence of diabetes mellitus when compared to lower socio-economic status subjects i.e., 60% of diabetes in the study were from high socio-economic status whereas only 16% belong to low socio-economic status and 24% belong to middle class family. Most of higher socio-economic status people were the inpatients of K.S.Hegde medical academy and are the from urban cities near Deralakatte indicating a higher prevalence of diabetes among urban population. There was higher prevalence of diabetes mellitus in younger age group, highest being 38 % in age group 45-54 years compared to 32% in age group 55-64 years and 18% in 64 years and above age group. This higher prevalence in younger age group may be due to the lifestyle of the younger population and also the stress factor which unmasks diabetes causing blood sugar to rise [13]. Other finding in our study was that 58% of diabetes was diagnosed with Diabetes mellitus within last 5 years when compared to 11% of them with duration of 15 years or more. Most of the diabetes had bad glycemic control i.e., 62% had a blood glucose level of more than 200 mg/dl when compared to patients with good glycemic control (6%). The reason for this might be the improper follow up and ignorance by the patients.

Males were found to be more affected (57%) by diabetes as compared to 43% being females. The reason for this might be that smoking, alcoholic habits and other lifestyle changes are seen more commonly in males and these factors have hallucinating effect on health including glycemic control. There was also greater prevalence of diabetes in Muslim population compared to Hindus and Christian. The reason for this finding may be dietary habits and lifestyles. Ignorance of medical assistance for their health problems by Muslim population of places around Deralakatte may be a contributory factor.

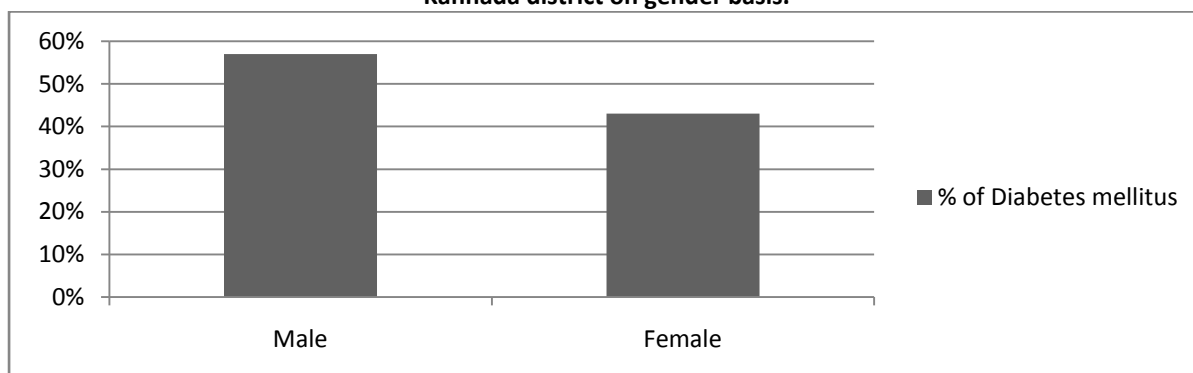**Fig: 1.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district on gender basis.**

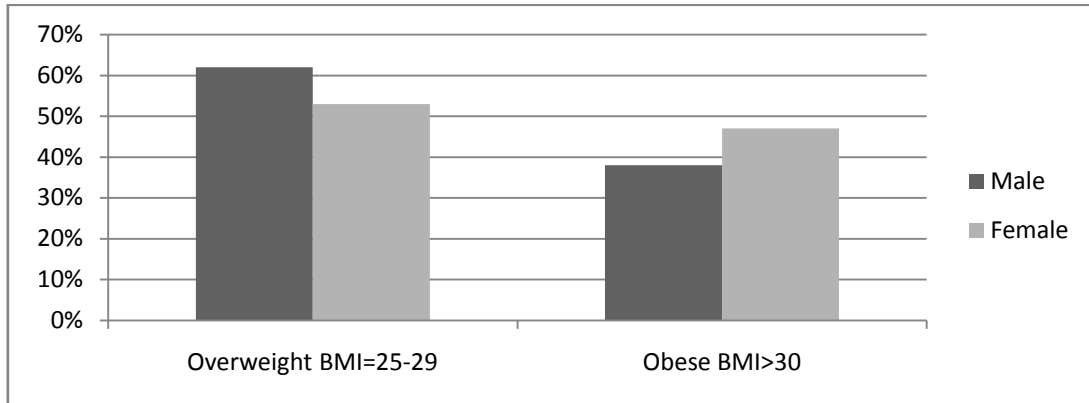**Fig: 2.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district on the basis of body mass.**

Fig: 3.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district by age.
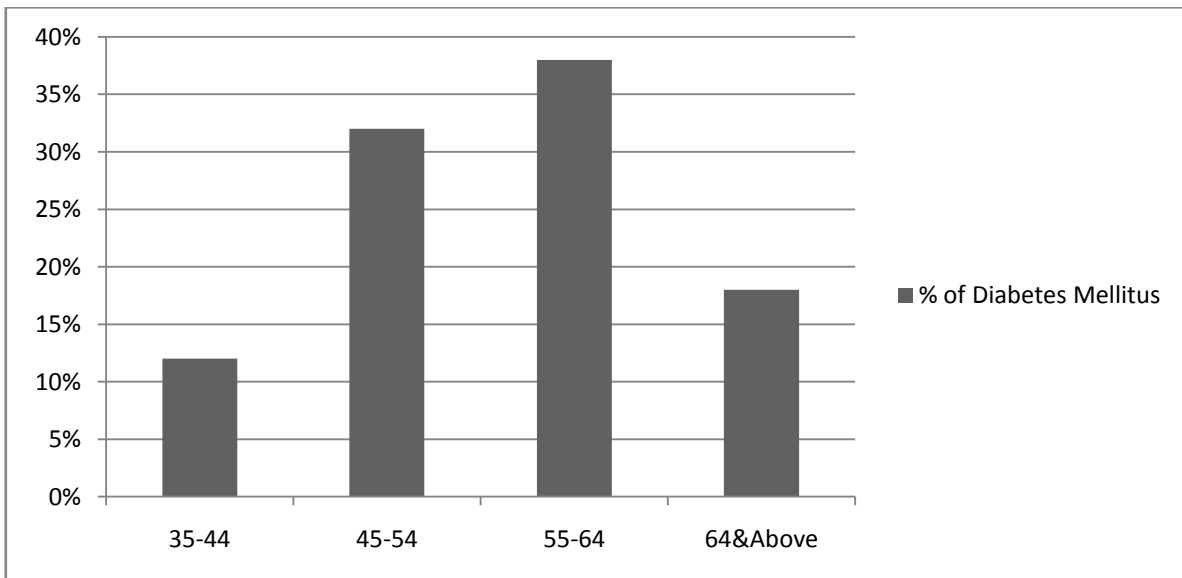
Fig: 4.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district by religion.
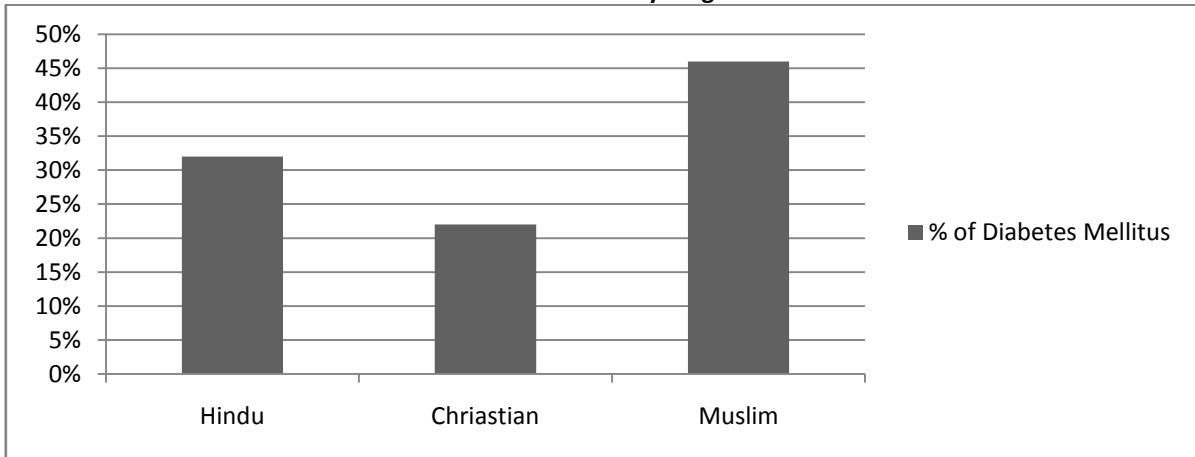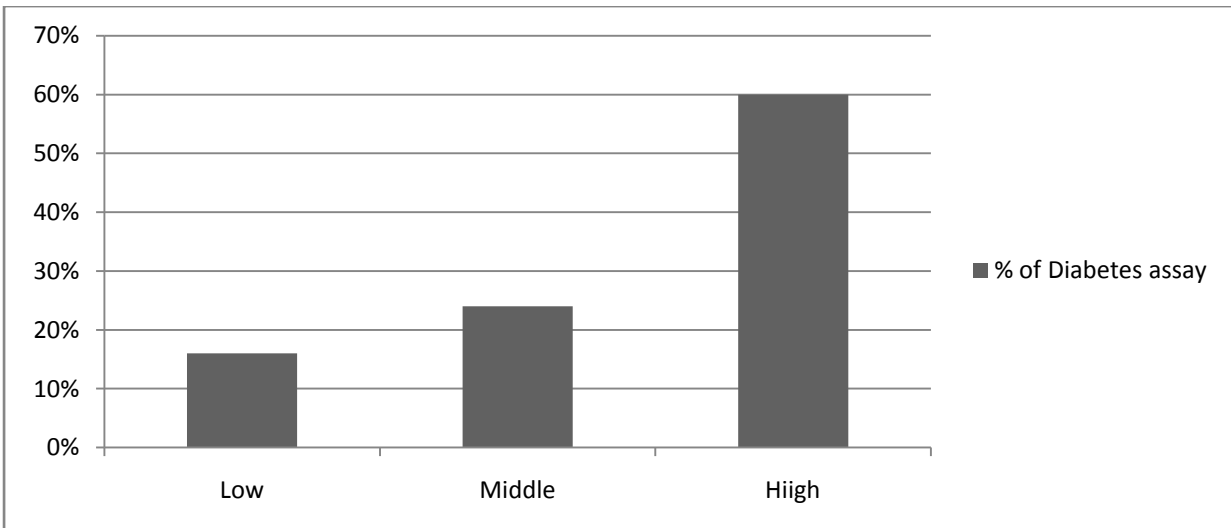

Fig: 5.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district by socioeconomic status.

6.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district on the basis of duration of the disease.
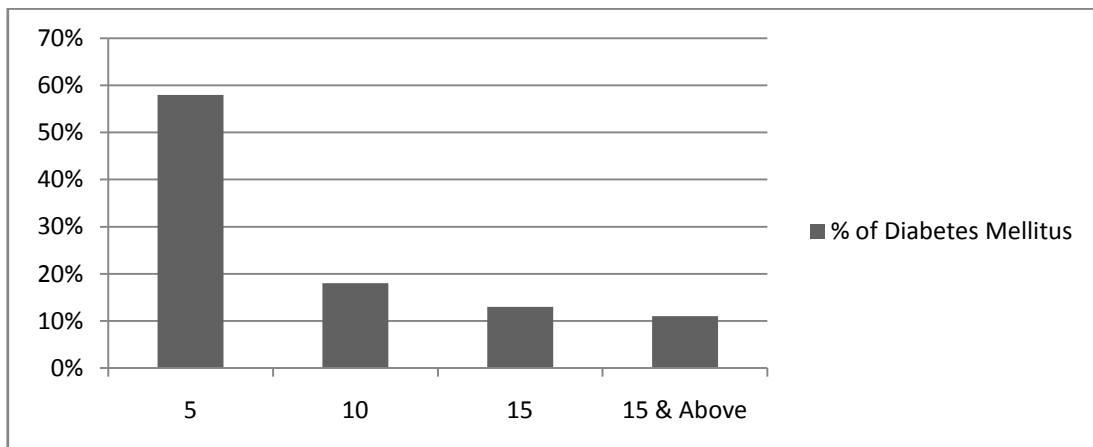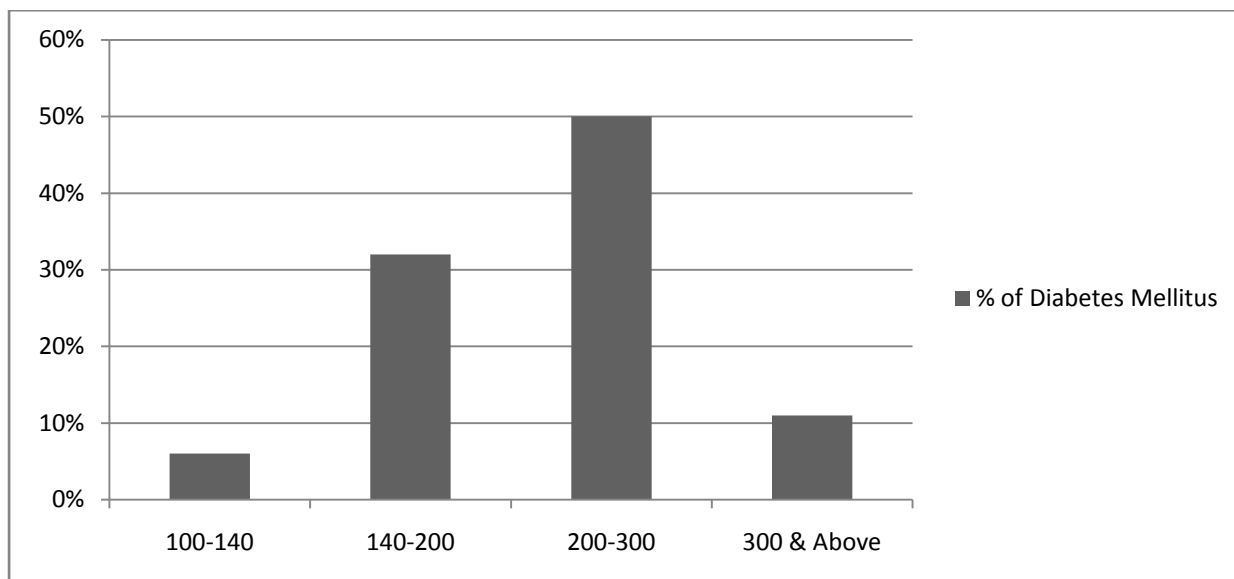
Fig: 7.Prevalence of Type 2 diabetes among the adult residents in Dakshina Kannada district by glycemic control.

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