Research Article

Study the performance of IDRS as screening tool for undiagnosed cases of diabetes and to find the prevalence of undiagnosed diabetes in tribal area of Palghar district.

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Abstract

Prevention and control of diabetes is a global priority in order to reduce the burden of diabetes on individual, families, communities and healthcare systems. The aim of the study is to identify those with undiagnosed diabetes to provide early treatment and prevent or delay the onset of long-term complications. It also focuses on the identification of those at high risk of presenting diabetes, aiming to decrease the frequency of known risk factors such as obesity, lack of physical activity and deficient diet. The concept of prediabetes is new in India, less amount of prevalence studies were available, so we have considered the prevalence of diabetes studies along with prediabetes studies, as risk of conversion from prediabetes to diabetes is very high if we fail to do the early identification of the individuals. The study is performed to assess the risk of diabetes mellitus in adults in tribal area of Palghar district using the Indian diabetes risk score (IDRS).

Keywords:, diabetes mellitus, Palghar district, risk factors, IDRS

Introduction

India is a expansive country with populations having difference in racial admixture as well as in social and cultural habits. It is likely that the frequency of non insulin dependent diabetes mellitus (type II diabetes) can be different in various races due to genetic and environmental differences. In three cross sectional studies in the urban south Indian population, we noted high prevalence of type 2 diabetes comparable to that of migrant Indian populations. It was also noted that the frequency was increasing over the years in this population (8.5 to 11.6%). While reports are available from southern and northern parts of India, there has been no report from the wide north eastern region of India. This study was undertaken in an urban population in the north eastern region of India where no epidemiological study in diabetes had been done. The result showed that the frequency of type 2 diabetes in urban population was same in northern eastern and southern regions of India.

A. Origin of the Research Problem:

Great efforts have been made by developed countries to control infectious diseases, but non-communicable diseases have not received much attention. Diabetes mellitus is one of the non-communicable diseases which have become a major global health problem. The worldwide prevalence of diabetes mellitus has risen dramatically in the developing countries over the past two decades. It is a metabolic disorder defined by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from deformity in insulin secretion, insulin action, or both. Diabetes is no longer only disease of the elderly but is one of the major causes of morbidity and mortality affecting youth and middle aged people. India is leading the world with largest number of diabetic individual earning the title "Diabetes capital of the world". To create awareness among the people is very essential about this disease.

B. Need for the study:

In Asia, frequency of diabetes is excessive and it has been estimated that 20% of the current global diabetic population is present in South- East Asia. Indeed, the number of cases in India is likely to multiply in two decades that is from 39.9 million (in 2007) to 69.9 million by 2025.Carefully planned screening programmes are an important component to help solve this problem. Hence a study is planned to assess prevalence of diabetes and its associated risk factors among adults in tribal area of Palghar district. There is very little data available on the level of awareness and prevalence about diabetes in developing countries like India. Such data is very important to plan a program on public health.

C. Objective of the Research Survey:

1. Prevention and control of diabetes is a global priority in order to reduce the burden of diabetes on individual, families, communities and healthcare systems.

2. The aim of the study is to identify those with undiagnosed diabetes to provide early treatment and prevent or delay the onset of long-term complications. It also focuses on the identification of those at high risk of presenting diabetes, aiming to decrease the frequency of known risk factors such as obesity, lack of physical activity and deficient diet.

3. The concept of prediabetes is new in India and very few amount studies are currently available, so we have considered the prevalence of diabetes studies along with prediabetes studies, as risk of modification from prediabetes to diabetes is high if the early identification of the individual was not done.

4. The study is performed to assess the risk of diabetes mellitus in adults, in tribal area of Palghar district using the Indian diabetes risk score (IDRS) developed by Mohan et al.[6]

D. Rationale and Interdisciplinary relevance:

There are very limited studies on diabetes awareness and prevalence in tribal communities of country. Hence this generality and knowledge assessment study is undertaken. Such data are very important to plan the public health policies with specific reference to implementation of National Diabetic Control Program. The diabetes situation in India has worsened in the last two decades. Representative data on knowledge and awareness about diabetes is scarce in India and is extremely important to plan public health policies aimed at preventing and controlling diabetes.

E. Review of Research and Development in the field:

As stated earlier there are limited studies on diabetes awareness and prevalence in tribal communities. Some review articles are found where such type of studies were performed and are as Prevalence of diabetes in northern India (Delhiarea) by Ahuja et al.[7], High prevalence of

diabetes in an urban population in south India, by Ramachandran et al.[8], Awareness and knowledge of diabetes in Chennai, by Mohan et al.[9] Relevance to social benefit by this R&D in the process area. This will be the first report of its kind on tribal population-based incidence of Diabetes in a Palghar District of Maharashtra state. We can create an Awareness about Diabetes among these people where to avail Medical help is difficult. Hence there is a greater scope for prevention of diabetes among tribal population.

Tribal houses in area). A written permission was taken from the he population screened contain of mostly literate urban masses of different socioeconomic strata. The population consisted of all caste and religion of various area like Chimbi Pada, Some part of Bhiwandi, Agarwadi area of Palghar, Dahanu of Palghar District. The staple food was mainly rice, fish and Other Non-veg and majority of them used Palm Oil for cooking. The population studied were mainly housewives, skilled workers, retired persons, businessmen.

Materials and Methods

This survey was done in the Tribal area of Palghar District and Some Slum areas i.e. Pada (Groups of

Table no. 01: Material used for survey

Sr. No.	Name of Instrument/Equipment	Make/Model
1	**Glucometer--[2 nos]**	**Accu-check**
2	**Blood pressure monitor[2 no]**	**Omron**
3	Weighing Scale	Bolt
4.	**Consumables** **1]Strips for glucometer [500nos.]** **2] Needles for glucometer [500nos.]** **3] Gloves** **4] Mask** 5] Lancet 6] Cotton 7] Alcohol Swab 8] formline 7] Disposable bags	**Accu-check** **Gibson**

Survey procedure:

A preliminary door to door count was conducted to collect details of persons aged 20 years and above. Tests were performed daily in the month of June 2022. Volunteers and Students from VIVA Institute of Pharmacy helped in conducting the study. A doctor and some technicians were busy with the study. All the tested persons were fasted overnight (minimum 10 hours) and the period of fasting was discovered by questioning the study subjects prior to registration.

Part 1. A preliminary house to house survey of the entire village is to be done to identify adult population.

Part 2: House to house survey of selected subjects is to be carried out in the village using predefined and pre-tested proforma.

Screening for diabetes is to be carried out in an tribal village.. IDRS tool comprising of two modifiable (waist circumference, physical activity) and two non-modifiable risk factors (age, family history) for diabetes is to be used to assess

the risk of diabetes. Conformation of diabetes is to be done using blood sugar levels on fasting sample.

Blood pressure is to be checked twice at an interval of 10 minutes using Omron electronic BP apparatus (OMRON-HEM7111, OMRON Healthcare Co. Ltd. Uky-Ku, Kyoto, Japan).

Part 3: At the end of part 2, participants are to be asked to remain empty stomach overnight (at least 8 hours) [10] and get their blood sugars checked on the following day. Next day morning between 8am-10am, blood sample collection is to be carried out for the purpose of estimation of fasting capillary glucose (FCG) using Roche ACCU-CHEK® active glucometer, Roche Diagnostics. Total five revisits are to be paid to increase overall response rate. A copy of report of FCG is to be given to all participants regardless of the results.

Diagnosis of diabetes was made if the post glucose value was 200 mg/dl and above it and diagnosis of IGT was made is the post glucose value was between 140 mg/dl to 199 mg/dl. During the survey details of age, sex, address, occupation community and education, were collected and recorded. Socioeconomic status was classified as high, medium and low, according to their living standard, type of work and income, elicited by survey.

Time spent on desk work and manual labour, on house work and outdoor activity were also found out. Physical activity was divided into three categories viz sedentary (elderly, retired executives, businessmen), moderate (house wives, professionals, teachers, skilled workers) and heavy (service forces, manual labours).

Criterias which we are going to apply for our methodology:

a. Diabetes: Diabetes is diagnosed if the fasting plasma glucose is 126 mg/dl (7 mmol/l) or 2 hour post glucose is 200 mg/dl (11.1 mmol/l).[11]

b. Pre-diabetes: Pre-diabetes is diagnosed if the fasting plasma glucose is 110 (6.1 mmol/l) and <126 mg/dl (<7 mmol/l) – impaired fasting glycemia (IFG) or 2 hour post glucose is 140 mg/dl (7.8 mmol/l) and <200 mg/dl (<11.1 mmol/l) – impaired glucose tolerance (IGT).[11]

c. Indian Diabetes Risk Score: The Indian Diabetes Risk Score (IDRS) described by Mohan *et al.* is calculated in all individuals as described previously. IDRS is calculated using four simple parameters, age, family history of diabetes, physical activity and waist circumference. [6]

d. Hypertension: Defined as a systolic blood pressure of 140 mm of Hg or a diastolic blood pressure of 90 mm of Hg or the use of blood pressure lowering medications for hypertension. [12].

Physical Activity: Classified into three parts:

(1) Inactive, when the individual shows inactivity at work, transport, and leisure time;
(2) Vigorous when the individual doing vigorous activity at work, transport, or leisure time
(3) All other individuals are classified who have moderate activity.

Body mass index: It is calculated by the formula:

BMI = Weight (Kg)/height (m 2)

Obesity is defined as anyone having BMI equal and above 25 kg/m 2 according to the recommended guidelines for Indians obessed is defined as body mass index (BMI) of more than or equal to 23 kg/m2 and obesity as 25 kg/m2.

Results and Discussion

In the survey reported here an attempt has been made to find out the frequency of diabetes in a poor rural tribal population of Palghar District. Surveys conducted earlier in this country have been mostly on urban and semi-urban population of masses. The data were analysed and interpreted for their result as follows:
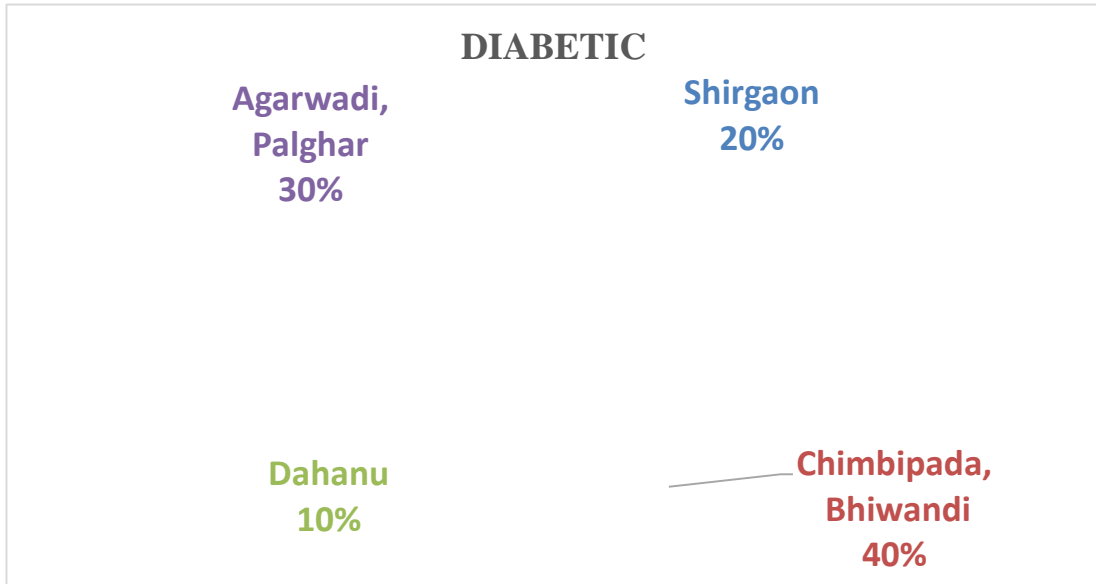
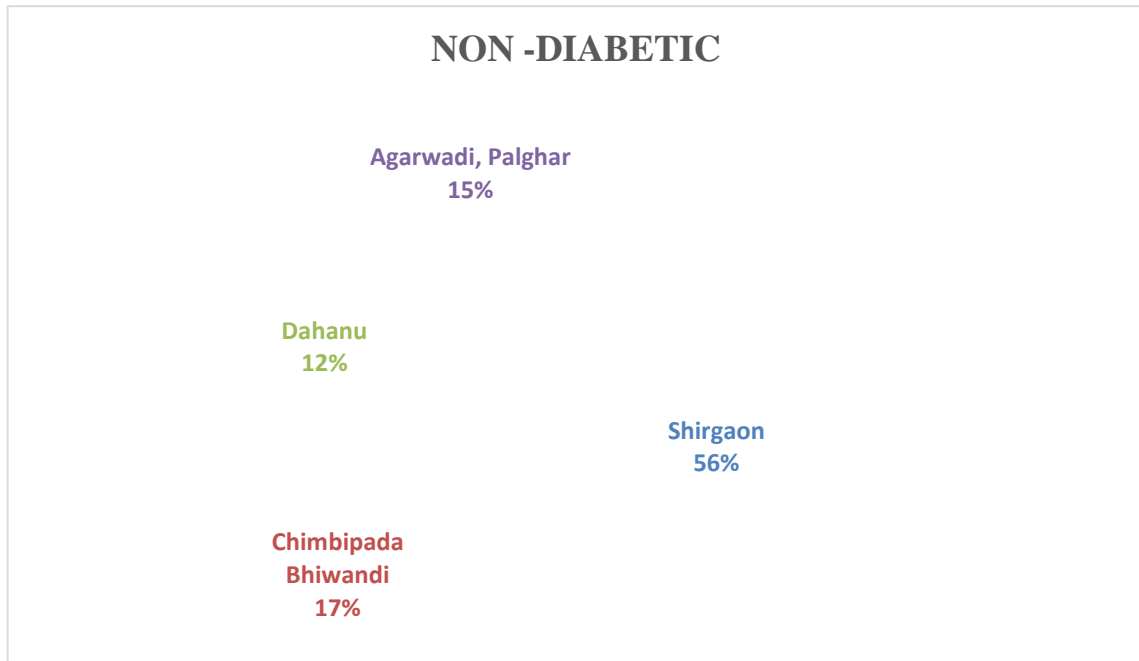**Figure 01: Diabetic Patient in various area of Palghar District from samples collected**

Figure 02: Non-Diabetic Individuals in various villages of Palghar District from samples collected
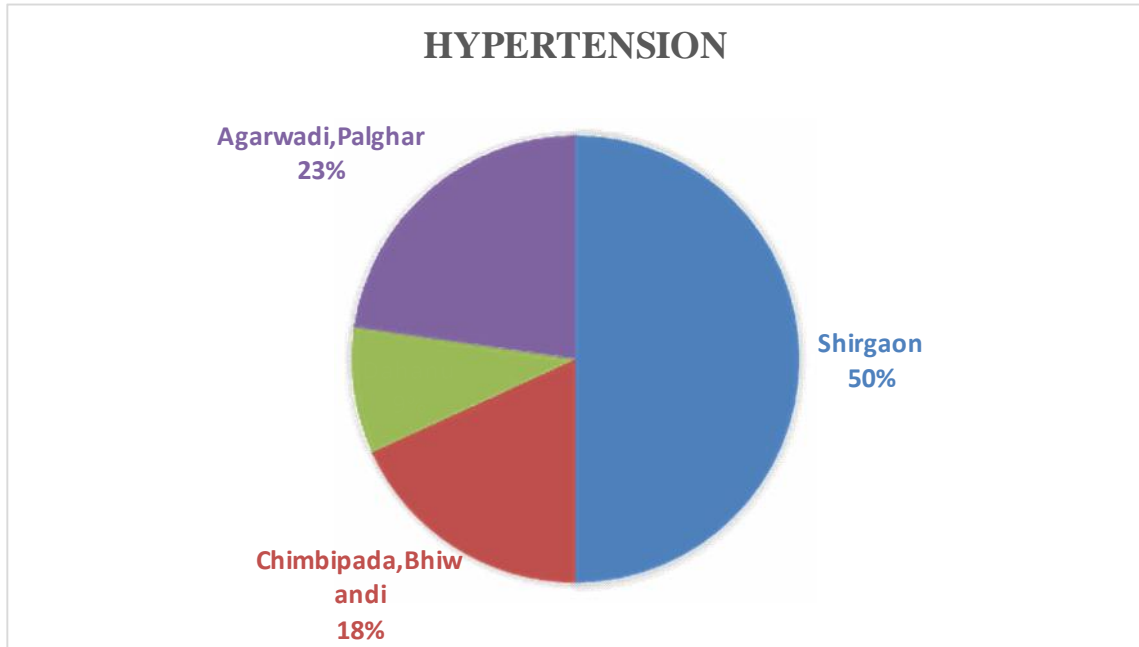
Figure 03: Individuals suffer from Hypertension in various villages of Palghar District from samples collected.
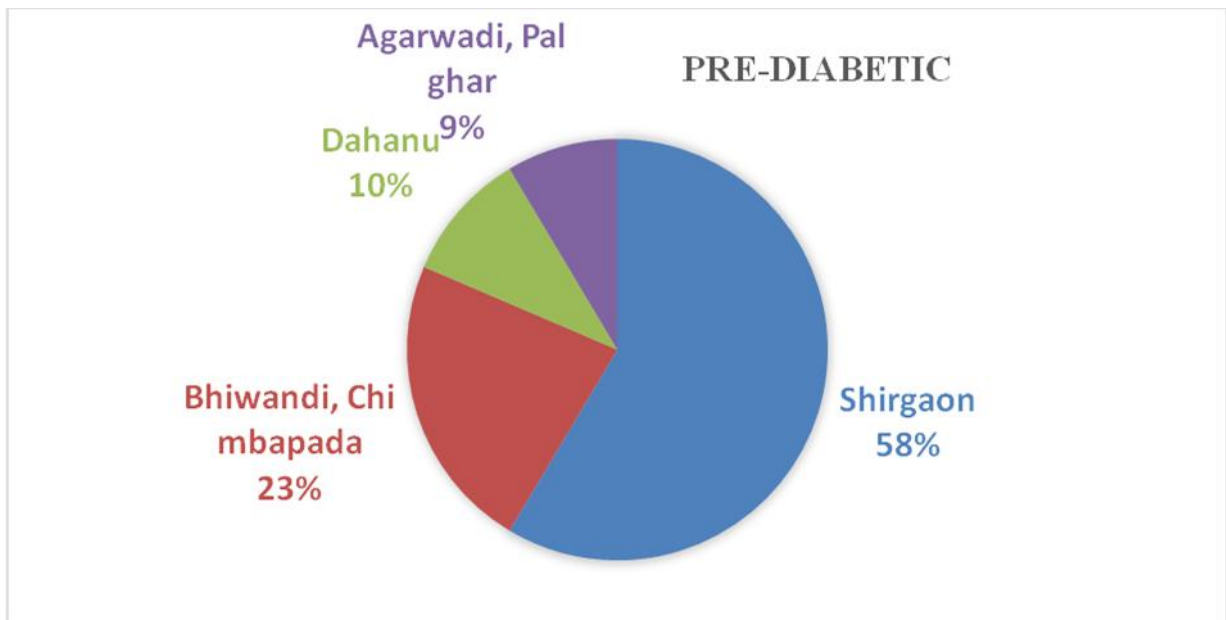

Figure 04: Individuals suffer from Pre-diabetes in various villages of Palghar District from samples collected.
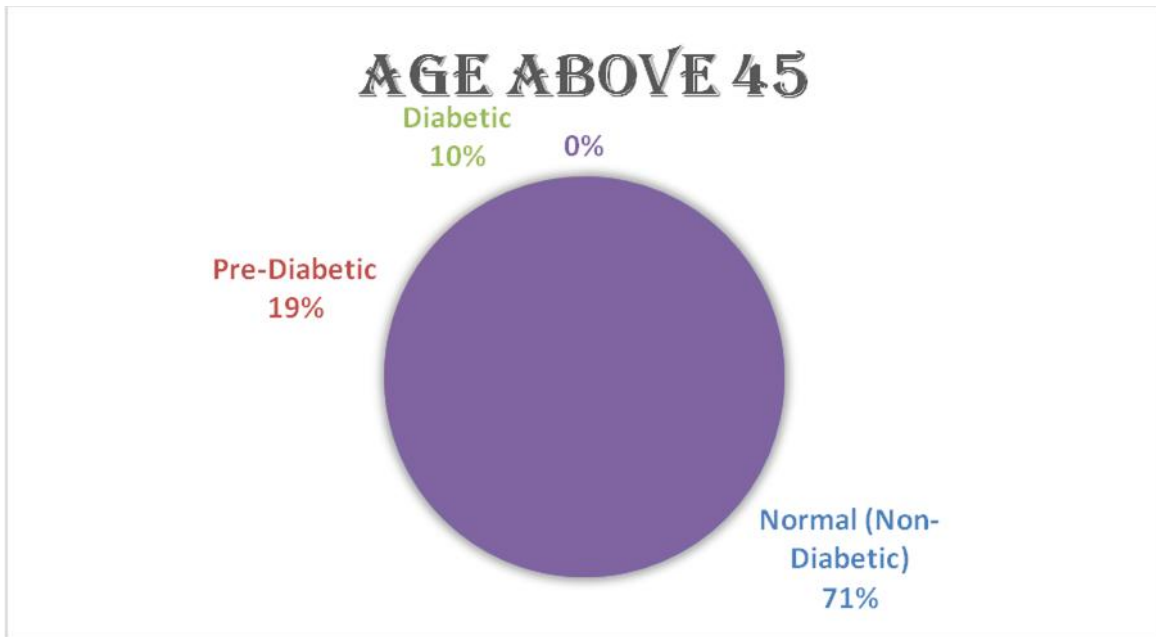
Figure 05: Percent of population above 45 age various villages of Palghar District from samples collected.

Table 02: Percent for the Prevalence of Diabetic, Non-diabetic Individuals.

Sr. No.	Particulars	Male	Female
1	Normal	35	40
2	Diabetic	05	05
3	Pre-Diabetic	08	07
4	Hypertension	15	087
5	Hypotension	01	01
6	Total	48	52
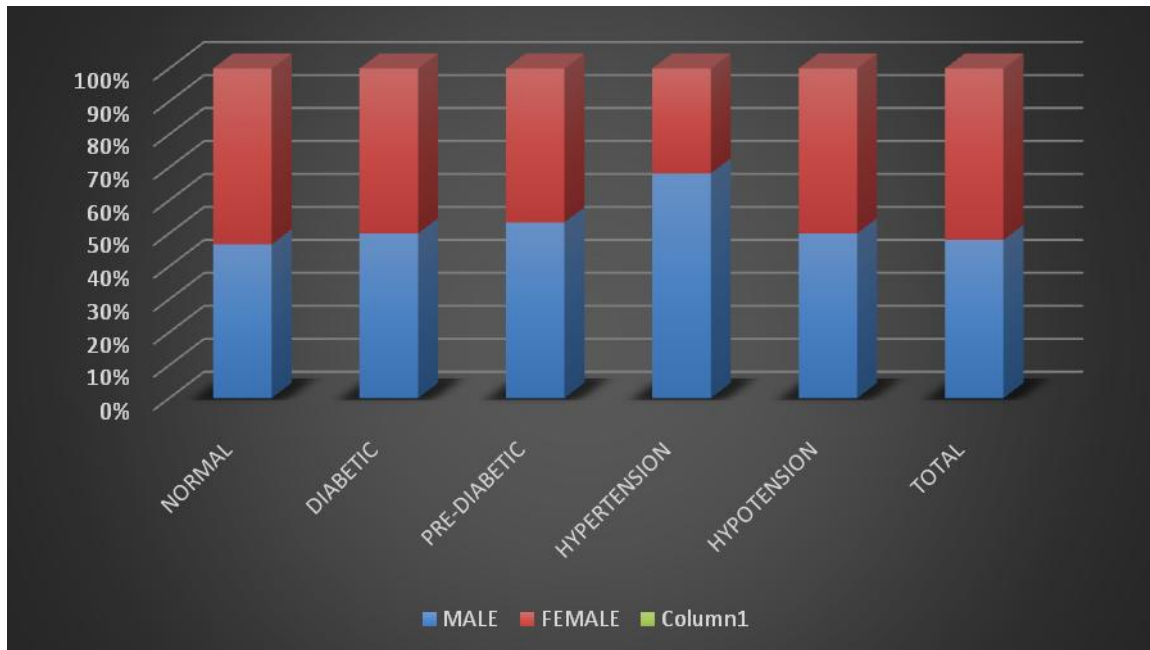
Figure No. 06: Prevalence of Diabetic and Non Diabetic Individual

From detection drives that were carried out in the rural area estimates were taken. The population which underwent screening was comprised mostly of illiterate or semiliterate, sufficiently well-nourished individuals and cannot, therefore, be considered as representative of the crucial part of the country's population. In the present study of an undernourished rural population, the over-all prevalence of diabetes was observed to be around 50 per cent. It was also observed that all diabetic in the tested blood were diabetic as per the opinion by their hyperglycemic response.

The over-all generality of diabetes was the same in both male and female. Though the generality increased with age, only in women the differences were significant. In the United States of America the generality in individuals below 45years of age has been observed to be about 1 % and that in those above this age, more than 5.0% . The percentage prevalence data obtained in the present study are near to those figures. Whether age per or the near perpetual state of lactation has any effect on prevalence of lactosuria needs to be studied. However, analysis of our data shows that to the incidence of lactosuria, parity may not be related. It is widely accepted that among lactating mothers lactosuria is common, but there appear to be no data on the incidence of lactosuria in various countries. It is hence difficult to determine whether this high incidence of lactosuria is a universal phenomenon or whether it is conditioned by maternal malnutrition.

Conclusion

The current study shows that even in an undernourished population, diabetes may be common. This is in contrast to the commonly observed relation of diabetes and obesity in affluent countries. Tripathy and Kar17 had observed earlier a large incidence of marked underweight among diabetics admitted to a hospital in India. On the other hand, Datta et al.18 attributed the low incidence of diabetes, 0.7 per cent,.

However, the criteria used by both groups of workers to measure underweight is still unknown. It has been suggested that for actualization of diabetes, obesity may be the predominant determinant. On the other side, it appears that genetic or environmental factors, like under nutrition, may be of equal importance. Moreover, under nutrition does not appear to substantially protect a population from the risk of diabetes. In the developing countries, survey for diabetes remains a method of necessity by glycosuria screening, though never of choice. When the techniques employed for detection of glucose include other reducing substances (this holds good in the case of blood sugar estimations also), it is essential that lactose be excluded. The current survey revealed some interesting facts regarding the generality of lactosuria in the community. About 50 % of the females in the reproductive period (20-50 years).

The Study conclude from the result that, Tribal area is now susceptible to the prevalence of diabetes. India is home to 40.9 million people with diabetes – nearly 15 percent of the global diabetes burden; it contributes 1 percent of the world's diabetes research.

Projections show that this will increase to 70 million by 2025. As India has a population of 1.2 billion, 40% of whom are under the age of 18, investment in the health of India's future workforce is crucial.

Acknowledgments

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