

HEALTH ASSESSMENT AND CASE ANALYSIS OF DIABETES IN RURAL POPULATION OF THIRUVALLUR DISTRICT, TAMILNADU, INDIA

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ABSTRACT

Purpose: WHO estimates that more than 346 million people worldwide have diabetes. Majority of the population today is not just trying to be economically successful but also aim to stay fit and free from dreaded chronic diseases. This investigation aims to evaluate the health conditions of people from remote areas who have less possibility of utilizing the urban health facilities of India. **Methodology:** A cross sectional study was conducted to clinically assess diabetes in rural population of Thiruvallur district by using a predesigned and pretested protocol to find out the prevalence and the risk of diabetes mellitus in general population. The study mainly focuses on rural population so as to suggest possible treatment and remedial aspects. Various studies in the test used are based on simple anthropometric, demographic and behavioral factors to detect undiagnosed diabetes. The responses for the questions were collected, evaluated and statistically analyzed. **Findings:** Out of 250 subjects, only 5% showed symptoms of diabetes (first time diagnosis) and among them half were in the early stage of the disorder. **Conclusion:** This study reveals that diabetes awareness prevailed among selected individuals about the hygienic system and life style. It was found that people acquired maximum knowledge with better understanding of the disease, better impact on the progression of the disease and complications by patient counseling through verbal and pictograms.

Key words: Diabetes; health conditions; rural population; anthropometric; demographic.

INTRODUCTION

In Asia, prevalence of diabetes is high and it has been estimated that 20% of the current global diabetic population resides in South East Asia. The rural population in India is generally poor, like many of those in other countries of Asia and Africa. Low and middle income groups face the greatest burden of diabetes mellitus.

Diabetes is an autoimmune disease prevailing both in the developed and the developing countries. The term diabetes is derived from a Greek word which means "siphon". Aretus a Greek physician coined the condition diabainein during the second century. He narrated that patients who were passing too much water (polyuria) resembles like a siphon. In 1675, Thomas Willis included mellitus to the term Diabetes, even though it is commonly referred to as diabetes. Diabetes patients have excess glucose in the urine and it is sweet like honey. Diabetes mellitus could literally mean "siphoning off sweet water".

Diabetes mellitus (DM) is a group of metabolic disorders in which a person possesses high blood sugar. Type 1 DM is characterized by loss of insulin-producing beta cells of islets of Langerhans in the pancreas causing relative lack of insulin. This increased incidence in the global population is because of aging, lack of exercise and obesity.¹⁻⁶ DM is characterized by hyperglycemia, deranged metabolism and sequel, which predominantly affects the vasculature.

The major types of DM

- ◆ Type 1 diabetes mellitus occurs due to the inability of body to generate sufficient amount of insulin.
- ◆ Type 2 diabetes mellitus occurs from resistance to insulin, initially with normal or increased levels of circulating insulin.
- ◆ Gestational diabetes occurs in pregnant women initially and developed during pregnancy. Gestational diabetes affects about 4% of all pregnant women.
- ◆ Maturity-onset diabetes of the young (MODY) indicates as mild hyperglycemia at a young age and usually inherited in an autosomal-dominant manner.
- ◆ Secondary diabetes accounts for only 1-2% of patients with DM.

The reasons

- ◆ Pancreatic disease: cystic fibrosis, chronic pancreatitis, pancreatectomy and carcinoma of the pancreas.
- ◆ Endocrine: Cushing's syndrome, acromegaly, thyrotoxicosis and pheochromocytoma.⁷⁻¹²

Signs and symptoms

- ◆ Frequent urination
- ◆ Excessive thirst
- ◆ Unexplained weight loss
- ◆ Extreme hunger
- ◆ Sudden vision changes
- ◆ Tingling or numbness in the hands and/or feet

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- ◆ Feeling very tired most of the time
- ◆ Dry skin
- ◆ Sores that are slow to heal
- ◆ More infections than usual

A survey was carried out in adults of rural areas of Thiruvallur district of Tamilnadu, India to assess the prevalence of DM in undernourished population groups. Special detection drives and public announcements were made for the people to attend the health camp. Pamphlets were issued with the sole aim to study the management of diabetes by rural communities.

MATERIALS AND METHODS

The family history about diabetes was obtained for all the subjects. The details on physical activities and other parameters were assessed, using a validated questionnaire.

Inclusion criteria

Subjects of age between 20 and 70, who are living in rural areas of the study region.

In addition to standard socio-demographic factors (age, sex, nativity, height and weight), potential risk factors for diabetes were assessed (e.g. Diabetic parents, grandparents, infant- nutrition, day care attendance etc.)

Exclusion criteria

Critically ill and persons with other co-morbidities.¹³⁻¹⁷ The validated questionnaire covered the following important questions.

- What is your occupation?
- Do you exercise regularly or in your leisure time?
- How would you grade your physical activity at home?

Since the most people are illiterate, they are unaware of diabetes and its complications like wider health problems and the deleterious effects of diabetes. This includes smoking, elevated cholesterol levels, obesity, high blood pressure and lack of regular exercise.

Informed verbal consent was obtained from the study participants before obtaining the data. Provision for referral service was made for participants who were newly diagnosed as diabetic. The mechanism of action was explained in simple vernacular language for the benefit of the participants.¹⁸⁻²⁰

Study design

A short cross sectional based study and analysis was done in 250 persons belonging to lower middle socio-economic class. Out of 250 subjects, 127 constituted male and 123 female. 27% of the subjects were engaged in agricultural work, 33 % working in industry and 40 % in different walks of life with sedentary lifestyle.

Methods

A medical camp was conducted successfully in Thiruniravur as part of community service in creating awareness to people. 3 days before the camp staff members and volunteer team was sent for canvassing and distribution of pamphlets in rural areas of Thiruvallur. The camp was started at morning 8 am sharply and many people registered actively.

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Anthropometric measurements, blood glucose level test, blood pressure, height and weight were measured utilizing student volunteers and doctors. 250 people enrolled their name. The medical reports were given immediately to the patients for their benefit. The causes and symptoms of diabetes were explained to patients in video form.

Glucometer

- ◆ Glucose levels were measured using glucometer (Accu-chek, Aviva)
- ◆ Blood droplet of the patient was put on the test strip containing glucoseoxidase, an enzyme that reacts with glucose in blood and an interface to an electrode in the meter
- ◆ When the strip is inserted into the meter, the flux of the glucose reaction generates an electrical signal
- ◆ Glucometer is calibrated periodically so that the number appearing corresponds to strength of the current.

RESULTS

Anthropometric measurements

The height of the subjects was measured using measuring tape and weight was taken by weighing machine for the recruited adults. Individual subject BMI was calculated using the formula:

$$BMI = \frac{Weight (kg)}{Height (cm)^2} \times 10,000$$

The results are shown in Table 1.

Table 1 : Anthropometric measurements of the population surveyed

Age group (years)	Sample Surveyed			Height (cm)	Weight (Kg)	BMI
	Total	Male	Female			
20-30	29	17	12	161.7±0.42	58.7±0.38	22.45
31-40	140	72	68	161.5±0.37	56.5±0.36	21.66
41-50	50	24	26	161.5±0.48	63.7±0.43	24.42
51-60	22	08	14	159.6±0.53	56.0±0.48	23.14
>60	09	06	03	159.3±0.58	59.4±0.69	27.40
Total	250	127	123			

Distribution of participants according to Education level, Nature of work

The subjects were asked questions regarding their education status and nature of work. The results are shown in Table 2.

Table 2: Distribution of subject according to their education and nature of work

Sl.No.	Education status	Total	Nature of work	Total
1	Graduate and above	25	Agriculture	128
2	Primary to middle	174	Industry	73
3	Illiterate	51	Office/ Govt/others	49

Patient counseling

The medication information was provided orally or in written form to the patients or their representatives on directions for use, advice on side effects, precautions, storage, diet and life style modifications.

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Patient counseling was done with following aids

- ♦ Audio
- ♦ Visual
- ♦ Pamphlets
- ♦ Verbal
- ♦ Pictograms

Patient counseling was given to two groups of patient. To the first group, counseling was done with pictograms and verbal instructions and the second group with audio-visuals and pamphlets about diabetes. Pictogram and verbal instruction group achieved better results in interpreting the label instructions. The following life style choices were suggested mainly in patient counseling to help patients with diabetes to preserve and enhance their health and avoid some of the negative outcomes that can easily result from diabetes.

- Blood sugar management
- Sustained weight reduction (By diet and exercise)

Prevalence of DM in the study population is represented by pie- chart as shown in Fig 1.

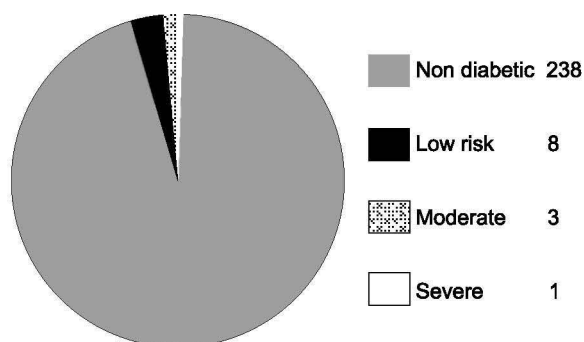


Fig 1: Prevalence of diabetes

DISCUSSION

Data analysis was performed by grounded theory, involving concurrent data collection and analysis, together with systematic efforts to check and refine emerging categories of data. Many participants diagnosed with an intermediate condition seemed confused. They appeared to be unaware of this diagnostic label or struggled to understand its meaning or the messages from their general practitioner.

- ♦ Indeed, the number of cases in India is likely to be doubled in two decades, that is from 39.9 million in 2007 to 69.9 million by 2025.²¹⁻²²
- ♦ A total of 250 persons were interviewed, among them 127 males and 123 females. Males had waist circumference of <90 cm and females >90 cm. According to the physical activity, most of them (73%) belonged to mild to moderate category of the disease.
- ♦ 5% of them only showed symptoms of diabetics (first time awareness).
- ♦ BMI analysis revealed that none of the subjects were underweight. All the subjects in the age bracket 20-60 are having normal body weight, while subjects above 60 years of age

are overweight. This distribution of BMI might be related to physical activity.

- ♦ The camp was conducted to gain knowledge about the disease process, predisposing factors, clinical manifestation and the disease management.
- ♦ Effective patient counseling was given regarding administration of drugs (22%), diseases (68%) and on healthy life style (10 %).

CONCLUSION

It has been found that only 5 % of the subjects showed the symptoms of diabetes who were given effective patient counseling in simple language. Illiterate people showed excellent response during counseling with pictograms of diabetes. Hence from this camp, people gained knowledge on diabetes and its method of prevention, which will help in improving the quality of care to diabetic patients and others.

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