

## **DIABETES AND CULTURE: A KERALA PERSPECTIVE**

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### ***Abstract***

This study is a survey of some of the cultural factors affecting blood sugar control in diabetes patients in a rural area of Kottayam district. This cross sectional study was conducted in a diabetes outpatient clinic in a rural hospital in Kanjirapally of central Kerala. A structured questionnaire to assess demographic and cultural factors was used. Samples of 300 diabetes patients were assessed. The study revealed that females are more affected than men. The majority in the sample had basic education only and belonging to middle and high income groups. More than half the sample had uncontrolled diabetes with an average HA1C of 8.7% and only 36% had normal B.M.I (Body Mass Index) ,the rest being either overweight or obese.. Physical activity levels were low. Diet was mostly non vegetarian. Consumption of tapioca by majority of the sample is a characteristic feature and 'fast food culture' is common. Religion is found to have a profound effect on blood sugar level. The observations could be utilised by physicians to incorporate a cultural element while devising an appropriate treatment plan.

***Keywords*** : Type 2 diabetes, Central Kerala, cultural factors

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## Introduction

India is a land of diverse culture, language and religion, true to its secular nature. The Indian Culture is often considered as an amalgamation of several cultures spread across the Indian subcontinent. The dictionary defines culture as "The sum of attitudes, customs, and beliefs that distinguishes one group of people from another. Culture is transmitted, through language, material objects, ritual, institutions, and art, from one generation to the next" (1). With culture varying from state to state in India, the disease pattern also changes especially with regard to the prevalence rates of diabetes.

Diabetes is assuming an epidemic proportion in India, as India is dubbed the diabetes capital of the world. The Diabetes Atlas, 2006 published by the International Diabetes Federation, expects the number of people with Diabetes in India to increase to 69.9 million by 2025 (2).

Numerous studies have documented the prevalence rates of diabetes in different states in India and it was found to vary considerably across the different states. This may be due to demographic transition which varies among the different states. Hence, a higher prevalence of diabetes could be expected in Kerala since Kerala has the highest proportion of elderly in India (3). One such study documents the prevalence rate in Kerala to be 20% (4) - i.e. more than double the national average of 8%. Kerala, with its high literacy rate and health indices, one would expect lower prevalence rates of life style diseases. This peculiar phenomenon is called the Kerala Paradox. Kerala Paradox refers to the unexpectedly and paradoxically high prevalence of lifestyle diseases - heart disease, diabetes, high blood pressure, and obesity resulting in very high mortality and morbidity (5). This rapidly changing scenario in Kerala may be due to socio-economic transition occurring in rural areas also. Environmental and life style changes resulting from industrialization and migration to urban environment from rural settings may be responsible for the increasing incidence of diabetes to a large extent..

Studies indicate that the prevalence rate of diabetes is highest in Central Kerala. The Amritha Diabetes and Endocrine population survey identified 9% reported prevalence and 10.5% prevalence of newly detected diabetes among semi-urban and urban adult resident in central Kerala (6). Yet another study documents a 16.3% prevalence rate in central Kerala (7), compared to 2.7 percent among coastal residents (8). Vijayakumar et al in 2007 carried out a cross sectional survey of 1990 adults of two panchayath wards in a central Kerala village. The prevalence rates were found to be 14.6%. This high prevalence rates even in a rural community validates the pandemic trend of diabetes (9).

This study was conducted in a central Kerala village- Kanjirapally with a population of 32680 of which 16073 are males while 16607 are females as per Population Census 2011(10). It is a hilly terrain where the chief source of income is rubber. This rubber rich land offers an affluent life style to its inhabitants. The effect of affluence and culture on the disease profile particularly life style disease like diabetes largely remains unstudied in the study area.

Kanjirappally village has high literacy rate. In 2011, literacy rate of Kanjirappally village was 96.97 % compared to 94.00 % for Kerala. In Kanjirappally male literacy stands at 97.66 % while female literacy rate is 96.31 %. (11).

The aim of the study was to analyze the effect of a few cultural factors on blood sugar control. Cultural factors like religion, diet, education, income, physical activity and body mass index (B.M.I.) were examined

## REVIEW OF LITERATURE

Recent studies indicate that specific cultural factors increase the risk of diabetes. One such factor is diet of an individual or community. Diet can affect diabetes in three different ways: via direct effects on blood sugar, the body's response to insulin and the risk of complications of diabetes (12). A diet rich in carbohydrates raises the blood glucose levels. A consistently high carbohydrate diet keeps the blood sugar consistently high too. Diet can also affect how the body responds to insulin. People who are obese or severely overweight are

much more likely to develop insulin resistance, which is caused by a diminished response by fat, muscle and liver cells to the effects of insulin. Insulin resistance is one of the major driving factors behind Type 2 diabetes, which typically strikes later in life. Diet also affects a person's likelihood of developing diabetes-related complications. Diabetics are much more likely to develop atherosclerosis, as high blood glucose levels cause the arteries to become inflamed, which makes it easier for cholesterol to build up in these blood vessels (13).

An annual report of the department of Animal Husbandry 2011-2012, (14) states that Kerala is the highest consumer of meat, with its daily requirement touching 5,000 tonnes. According to the State Animal Husbandry Department, Kottayam, Thrissur, and Malappuram lead the State's 14 districts in meat consumption.

A study by Joshi et al points out that the general clinical practice guidelines (CPGs) are not portable to diverse cultures, constraining the applicability of this type of practical educational instrument. Therefore, a transcultural Diabetes Nutrition Algorithm (tDNA) was developed and then customized per regional variations in India. The resultant India- specific tDNA reflects differences in epidemiologic,

physiologic, and nutritional aspects of disease, anthropometric cut off points, and lifestyle interventions unique to this region of the world (15).

Another study by Mitra shows that interpopulation differences exist in both diet and the socio-cultural factors both within and outside the subcontinent. Diversity of Indian population in intake of food, life-styles, socio-cultural beliefs etc are possibly due to different socio-cultural backgrounds (16).

## Materials and Methods

Samples of 300 patients were selected from a hospital in Kanjirapally which caters mostly to diabetes patients in the study area. They were of different cultural factors like Religion, diet and dietary factors, education and income. The patients were selected by convenient sampling method. These patients were interviewed by the researcher .

## Result and Discussion

The Christians constituted half the sample mainly as the study area is a Christian dominated area (17). According to the 1991 census, the largest number of Christians lived in Kottayam (45.8%). On the whole, the central districts of Kerala, from Pathanamthitta to Thrissur, which have only 40 percent of the total population of the state ,had among them over 70 % of the total Christian population in the state (18). A study in West Bengal by Analava Mitra in 2008 documents the ratio of diabetes patients among 7600 volunteers belonging to the Hindu, Muslim and Christian community as 11:8:13. He found that of the Muslims who do regular prayer five times a day the ratio is much less. The ratio in non-prayers, those who prays once a day, twice a day, thrice a day and five times a day are 9: 7: 5.5: 3: 2 respectively. He attribute it to the particular posture of Muslim worship may have some role. He further reports that while estimating serum insulin values (radio-immunoassay) of several volunteers maintaining identical conditions, repeated stooping exercises increased serum insulin values by 18-22 % (19). In this study too, all 75 Muslim patients were devout practising Muslims worshipping 5 times a day which may explain the lower number of uncontrolled diabetes cases among them . Further longitudinal study is necessary to establish the above fact.

In the present study of a sample of 300, 63.3% did not engage in any form of physical activity. The CUPS-14 also noticed higher prevalence of T2DM among those engaged in light work (20).When physical activity is considered, the leisure time activities also become important, since this involves additional calorie expenditure. Sedentary life style, watching television for long hours and working on computers as the risk factors for type 2 diabetes were pointed out in many observational studies (21). 75.6% of the patients who have uncontrolled diabetes spent more than 2 hours

of television viewing. Also 77.6% of the sample in the current study who have uncontrolled diabetes did not have any particular leisure time activities. More longitudinal studies are necessary to establish a etiological role of the same.

More than half the sample had basic education only. Delamater in his research article states that low levels of education are associated with low regimen adherence and consequent poor glycemic control (22).

Only 16.3% belonged to the BPL (below poverty line ) group. The rest belonged to the middle income and high income groups. This affluence can be traced to the cash crop cultivation (rubber). . This could explain the high calorie diet and luxurious standard of living of most of the respondents. Affluence is a risk factor for diabetes in this society and this fact is in accordance to the prevalence study in central Kerala (23).

More than three-fourth of the sample followed a non-vegetarian diet (93.3%, n=279).

Only 6.7% were vegetarians. Another peculiar dietary feature is the inclusion of tapioca as part of daily diet. Almost 92% (n=275) consumed tapioca on a daily basis. The mean A1C value of those who consumed tapioca on a daily basis was found to be 8.9 which signify poor glycemic control while it is 7.7 for those who did not. Clinical observations by local physicians and a recent review suggested an association between pancreatic damage and the consumption of the tropical starch cassava (tapioca) (24). Geevarghese and Mcmillan too brought out such a finding in their study in 1979. Further studies are necessary to establish the etiological role of tapioca in Diabetes (25).

More than half the sample (64%) had the habit of consuming food from fast food joints, bakeries and way side eateries. Kerala paratha made of Maida remains an all time favourite. The effects of fast food and sedentary life style have been established in the Chennai Urban Population Study (26). which records that 'fast food culture' which has overwhelmed our cities and towns is a major driver of the diabetes epidemic.

The participants were mostly overweight or obese. Obesity is usually measured by B.M.I. The mean B.M.I. of the sample was 27.3 kg/m<sup>2</sup> with a S.D. of 3.7. The cut off value for normal BMI for Asian men and women was 23kg/m<sup>2</sup> (27).

The blood sugar level or glycemic status (measured as HbA1C) of more than 3/4th of the sample was uncontrolled (77.3%) or the diabetes is poorly controlled (  $\bar{x} = 8.7, SD = 1.6$  )

As per the guidelines of the American Diabetes Association a HbA1C  $\geq 6.5\%$  indicates good glycemic control and a A1C level  $\geq 7$  indicates uncontrolled diabetes or poor glycemic control (28). Among the three religions, Syrian Christians have the maximum number of uncontrolled diabetes cases.(77.3%) followed by Hindus (60%) and the least among the Muslims (48%). Chi Square shows significant association

between religion and glycemic control at 0.01 significance level ( $\chi^2 = 20.51$ ,  $p = 0.000$ ,  $p < 0.01$ ).

## Conclusion

The study indicates the importance of cultural factors in blood sugar control. Hence these factors could be included while devising a treatment plan for the diabetes patients particularly in Kerala. This could result in better blood sugar control thereby improving the quality of life of these patients.

## Limitation

This study is a cross sectional study and the sample may not be truly representative of the population.

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