



Exploratory cross sectional investigation on diabetes (Madhumegam) population on the basis of their body constitution: A Siddha therapeutic approach

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Abstract

Diabetes mellitus (DM) commonly known by its name *Madhumegam* or *Neerizhivu* in Siddha terminology, it is a sustained metabolic disorder characterized by chronic hyperglycemia. DM is primarily due to either impaired insulin secretion or resistance to peripheral insulin binding or both. Conventional anti-diabetic therapy fails to provide adequate restoration in maintaining blood glucose level, further long term usage of allopathic medicine leads to certain potential side effects. Siddha system of traditional medicine has strategic principle on identifying the therapy required for each patient through unique techniques. The main objective of the present study is to categorize the patients according to their body constitution which would suggest suitable and appropriate therapy in managing DM. Investigation conducted on 300 diabetic patients with the age group varying from 31 to 90 years in both male and female patients. Results of the observation clearly suggesting that out of diabetes exist more on the age group between 50 to 70 years and 84.7% having family history of *Madhumegam* (diabetes). Among the comorbid complications systemic hypertension ranks first with the highest incidence of 59.67%. Further 79.67% having addiction towards smoking habituation. Body mass index plays a vital role in disease management from the present study it was observed that 35.67% patients seems over weight and 4.67% are under obese category. Siddha system has a classical approach on segregation of patients based on the body constituents. *Naadi* and *thegaillakanam* are the two constituents utilized for the present investigation. Study clearly states that majority of the population nearly 45% were indicated as *pithavaathhegi* and according to *naadi* classification 64 % were observed as *pithavaatham*. In conclusion this study has revealed an ideal strategy on categorization of the patients based on their individual body constituent's which provokes the therapy that suits them most in clinical management of DM.

Keywords: Diabetes mellitus, Siddha system, *Madhumegam*, *Neerizhivu*, *Naadi*, *Thegaillakanam*

1. Introduction

Diabetes mellitus (DM) is a major public health problem worldwide. Current global estimates indicate that this condition affects 415 million people and is set to escalate to 642 million by the year 2040 [1]. In diabetes chronic hyperglycemia in synergy with the other metabolic aberrations can cause damage to various vital organ systems, leading to the development of disabling and life-threatening health complications, most prominent of which are microvascular (retinopathy, nephropathy, and neuropathy) and macrovascular complications leading to a 2-fold to a 4-fold increased risk of cardiovascular diseases [2].

India considered to be world's capital of diabetes. The diabetic population in the country is close to hitting the alarming mark of 69.9 million by 2025 and 80 million by 2030. This denotes that the developing country is expected to witness an increase of 266%. The statistics recently accumulated showcase that culture of diabetes is more prevalent in the urban areas as 28% of the population living in cities are affected, whereas 5% of the rural population are positive with diabetes mellitus [3].

Several categories of drugs that have been currently used for the treatment of diabetes which can acts by multiple different mechanisms, such as stimulation of the release of insulin (e.g., sulfonylureas), reduction of hepatic glucose output and enhancement of the peripheral uptake of glucose (e.g. biguanidines) [4-6]. Some of the commonly used antidiabetic drugs include biguanides, e.g., metformin (*via* acting directly to influence insulin resistance), vildagliptin and other related “gliptins” (*via* blocking DPP-4, an enzyme that degrades the incretin GLP-1) and α -glucosidase inhibitors, e.g. acarbose and miglitol [7-8].

Major issue relies of regular usage of some diabetic medication results in potential adverse event. Usage of biguanides results in gastrointestinal distress, including diarrhea, cramps, nausea, vomiting, and increased flatulence. Metformin is a widely used drug for management of diabetes which offers side effects such as lactic acidosis, myalgia, flatulence, asthenia etc. Vildagliptin reported with adverse effects that included headache, nasopharyngitis, constipation, dizziness etc. Need of potential alternate therapy is high recommended for ensuring the safety on chronic usage. Worldwide usage of complementary and traditional for the management of diseases such as diabetes has rapidly increased over the last decade. It

is reported that up to 72.8% of people with diabetes used herbal medicine, dietary supplements and other alternate therapies.

Siddha is a pioneer traditional medicine which is in practice since several centuries before. According to the guidelines of siddha each human as independent body constitution which is dominated by three humors that is *vatham*, *pitham* and *kabam* [9]. Change in the proportion of these constituents may leads to several disorders one of this kind is diabetes mellitus (*madhumegam* or *neerizhivu*). Hence altering or reversing the humor to normal may by prescribing appropriate medication provides greater therapeutic successful in managing diabetes. The main aim of the present observational study is to categorize the patients according to their body constitution which would suggest suitable and appropriate therapy in managing DM.

2. Materials and Methods

2.1. Study design

Cross sectional observation study comprises of 300 diabetic patients presenting the clinical complications who are attending inpatient and outpatient department of Ayothidaspandithar siddha hospital at National institute of siddha, Tambaram Sanatorium, Chennai 600047, Tamil nadu, India. Study conducted according to the principles of qualitative research with application of focus for collection of information on the parameters relating the diabetes mellitus. Institutional committee clearance was obtained for this study with the total study period of 3 months. All patients subjected to the study will be explained in detail about the purpose of study, and those who are willing will be provided with data collection form (Questionnaire).

2.2. Questioner Pattern

The questionnaire was divided into fundamental sections that includes age, gender, dietary habituation, family history, co-morbidity, alcohol, tobacco dependence, body mass index inference of *naadi* and *thegaillakanam* among diabetic population.

3. Results

3.1. Impact of Age and gender among study population

Out of 300 patients screened 3% (male), 5.3% (female) are included in the age group of 31-40 yrs, 10.7% (male) 13% (female) are 41-50 yrs, 14% (male) 15.7% (female) are 51-60 yrs, 18.3% (male) 12.3% (female) are 61-70 yrs, 5% (male) 1.3% (female) are 71-80 yrs and 0.7% in 81-90 age group.

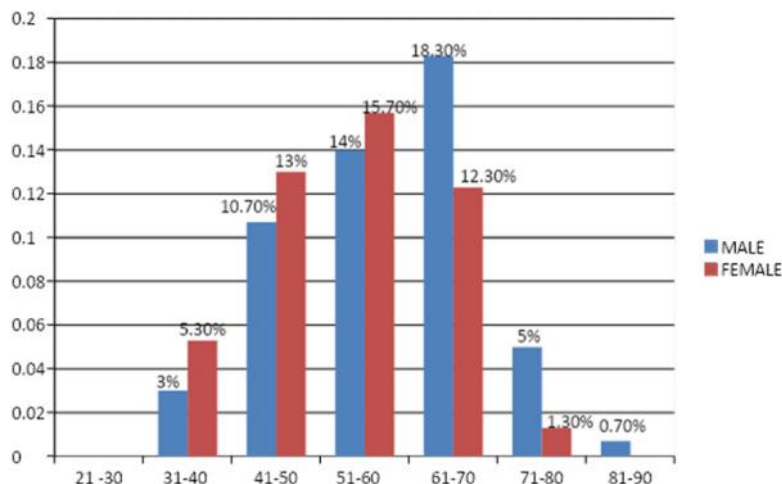


Figure 1: Age and gender prevalence among study population

3.2. Dietary habituation

In study population about 67% were under vegetarian diet among them 53% were taking milk daily 14% were taking ghee regularly.

Among non-veg population 14% were taking chicken periodically, 29% were taking mutton, 35% were taking fish weekly twice and 22% others.

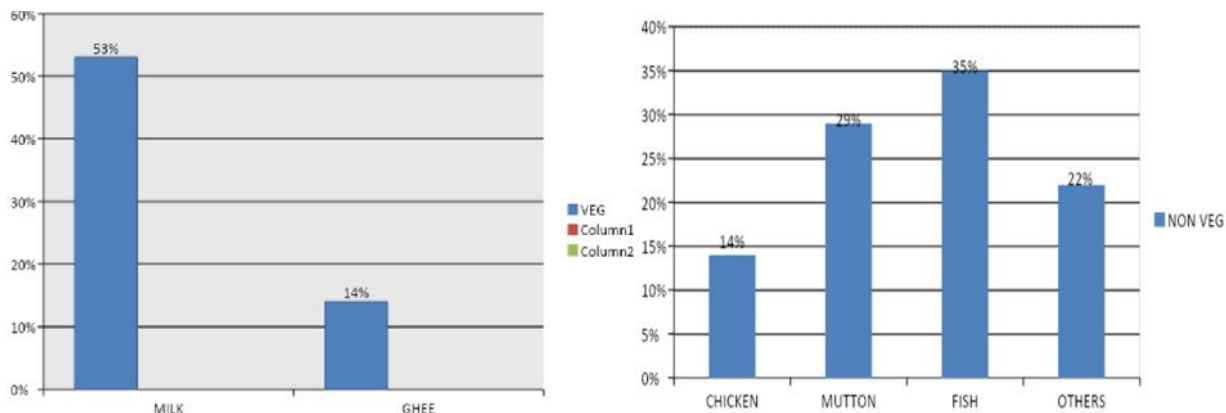


Figure 2: Impact of Dietary habituation

3.3. Family history and co-morbidity

In 300 patients about 84.7% having family history of madhamegam and less than 20% having no familial history. With respect the spectrum of secondary

complication 5% were having history of heart disease, 59.67% were having systemic hypertension, 3.3% were having history of chronic kidney disease, 2% are thyroid and 30% others.

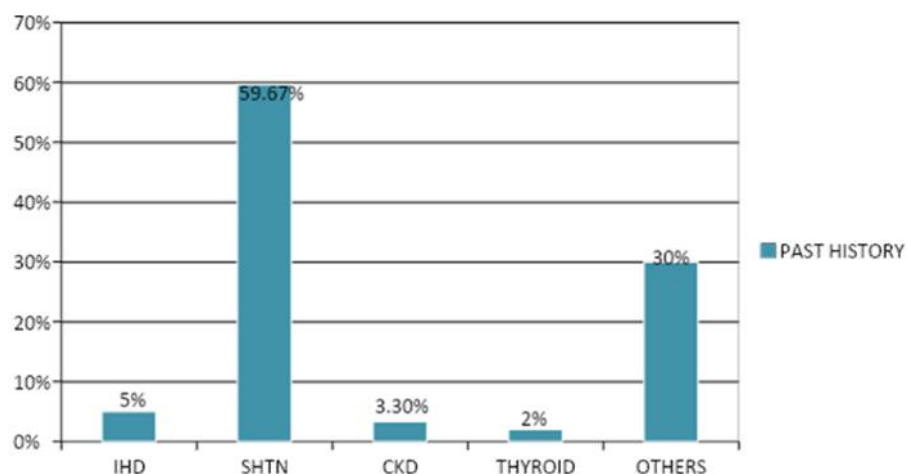


Figure 3: Family history and co-morbidity

3.4. Alcohol and tobacco dependence

In 300 diabetic patients 79.67% having addiction of smoking. 7.33% were addicted to tobacco. 4.3% having an alcohol habituation.

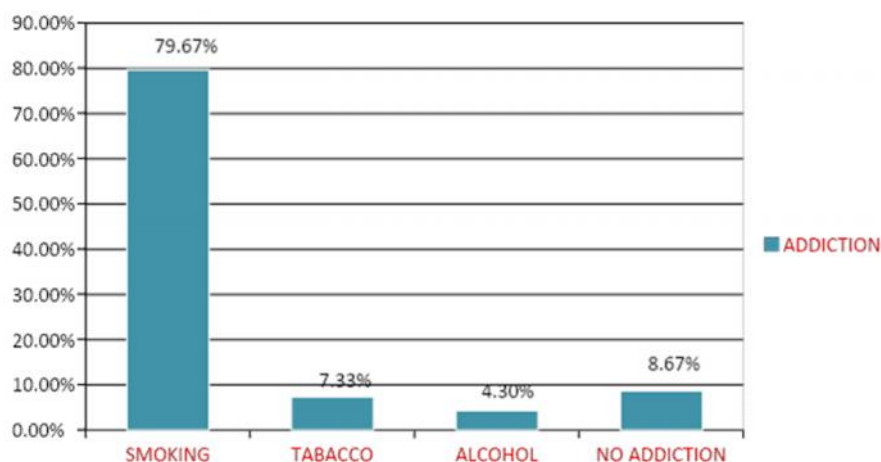


Figure 4: Alcohol and tobacco dependence

3.5. Body Mass Index

It was observed from the study that among 300 diabetic patients, 4.67% were obese, 35.67% were overweight, 0.67% are under weight and 59% normal.

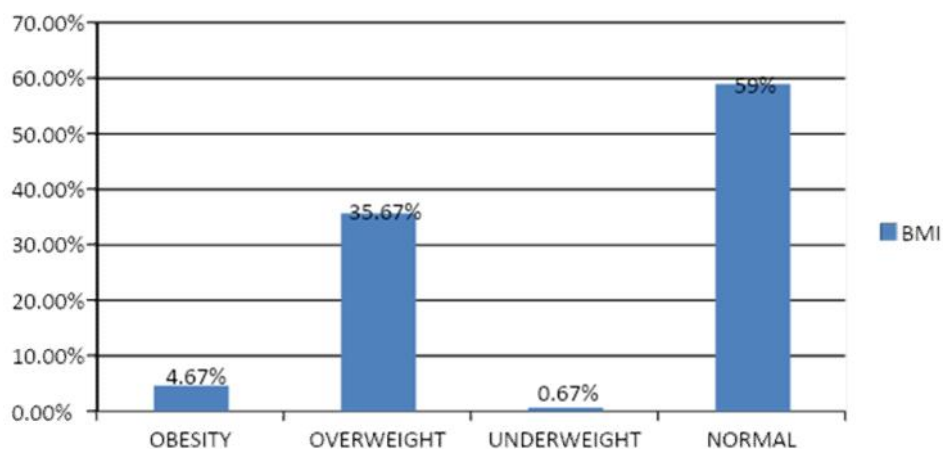


Figure 5: Body Mass Index

3.6. Inference of Naadi among diabetic population

An intellectual observation was made on observing the *naadi* of 300 diabetic patients 9.33% were

vaathapitham, 64 % were *pithavaatham*, 9% were *pithakabam*, 9% were *kabapitham*, 3% were *vaathakabam*, and 5.67% are *kabavaadhanaadi*.

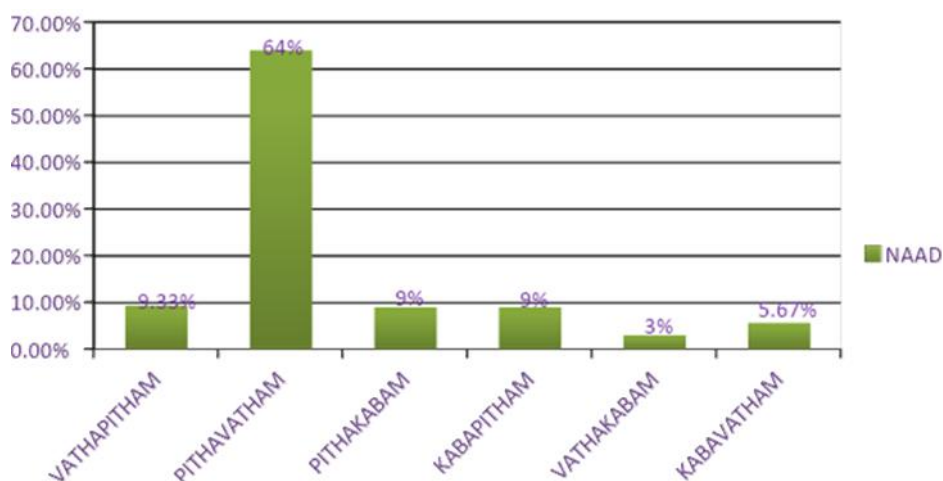


Figure 6: Inference of Naadi among diabetic population

3.7. Role of Thegaillakanam among diabetic population

Present study revealed that on observing *thegaillakanam*, 17% were *vathapithathegi*, 45% were *pithavaathathegi*, 7.3% were *vathakabhathegi*, 12.30 % are *kabavaathathegi*, 14% are *pithakabathegi*, 4.33% were *kabapithathegi*.

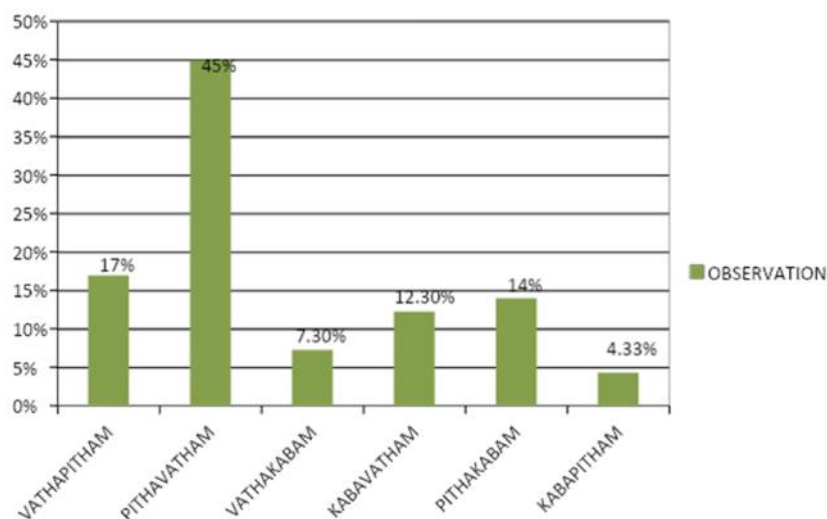


Figure 7: Observation on *thegaillakanam* among diabetic population

4. Discussion

According to data projected by international diabetic federation the global prevalence of diabetes in adults covers the age group in the range of 20-79 years. Out of 300 patients screened 3%(male),5.3%(female) are included in the age group of 31-40 yrs, 10.7%(male) 13%(female) are 41-50yrs, 14%(male) 15.7%(female) are 51-60 yrs, 18.3%(male) 12.3%(female) are 61-70 yrs, 5%(male) 1.3%(female) are 71-80 yrs and 0.7% in 81-90 age group. Results of the observation clearly suggesting that out of diabetes exist more on the age group between 50 to 70 years.

It was reported in the previous studies that there is strong correlation between the diet and type II diabetes. High intake of carbohydrates and fats have reported to be elevated glycemic index [10]. In the present study population about 67% were under vegetarian diet among them 53% were taking milk daily 14% were taking ghee regularly. Among non-veg population 14% were taking chicken periodically, 29% were taking mutton, 35% were taking fish weekly twice and 22% others.

Diabetes is a complex disease that is caused by a complex interplay between genetic, epigenetic and environmental factors. While the major environmental factors, diet and activity level, are well known, identification of the genetic factors has been a challenge [11]. Present study strongly indicates that 84.7% of the study population having family history of *madhumegam* (diabetes). Smoking is a major cardiovascular risk factor and the leading cause of

avoidable death worldwide [12]. After decades of studies, epidemiological evidence has firmly linked cigarette smoking with T2DM risk [13]. Some studies have shown alcohol to be positively associated with the incidence of T2DM [14-15]. Our study strongly suggests that out of 300 diabetic patients 79.67% having addiction of smoking, 7.33% were addicted to tobacco, 4.3% having an alcohol habituation.

lifestyle factors, in particular those related to obesity [16], contribute more on development of diabetes. In modern era both on developed and developing countries tend to have rapid increase in fat, saturated fatty acid and energy intake accompanies a decrease in physical activity that further worsen the disease state. It was observed from the study that among 300 diabetic patients, 4.67% were obese, 35.67% were overweight, 0.67% are under weight and 59% normal.

Principle of siddha system of medicine depicts that basic physiology and functionality of the humans depends on the balanced state of *vatham*, *pitham* and *kapham* [17-19]. Present review strongly indicates that according to *naadi* classification 64 % were observed as *pithavaatham*. This evidence based result suggest that individuals with elevated level of *pithavaatham* may be highly prone to diabetes [20]. Study also extrapolated the outcome of *thegaillakanam* analysis, according to the present observation majority of the population nearly 45% were indicated as *pithavaathathegi*. Hence it was proven that patients belong to *pithavaathathegi* category are at increased risk of developing or sustaining with diabetes.

The assessment of the economic and social impact of diabetes in India is important for several reasons. First, India is considered the diabetes capital of the world, yet not enough is done to tackle the disease. An article published in 2007 suggests that an estimated USD 2.2 billion would be needed to sufficiently treat all cases of type 2 diabetes in India [21]<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4279984/> - CR18. In comparison, health spending per capita in 2012 was USD 61. Second, by 2025, most people with diabetes in developing countries will be in the 45 to 64-year age group, thus threatening the economic productivity of the country and the income-earning ability of individuals [22].

5. Conclusion

The prevalence of diabetes increased in every state of India at the same time the policies and guidelines on controlling the prevalence of diabetes are very limited. Now DM becomes a major healthcare burden and destabilize the economic outgrowth of the country. Its highly mandate for the care providers to look for a safe and reliable therapy to ensure the wellbeing of an individuals affected with DM. Siddha system of medicine is one of the ancient practice of India emerged from the south and now flourishing globally. Unlike allopathy system of medicine siddha medicine treats individuals bases on their body constitution. Present observational study clearly indicates that classical diagnostic techniques like *naadi* and *thegaillakanam* are unique in identifying each type of patients and recommending them a right therapy which works well in managing the diabetes. In conclusion this study has revealed an ideal strategy on categorization of the patients based on their individual body constituent's which provokes the therapy that suits them most in clinical management of DM.

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