



PREVALENCE OF DIABETES MELLITUS IN SAURASHTRA REGION OF GUJARAT: A SURVEY

Sharma Rohit^{1*}, Gokarn Rohit¹, Amin Hetal², Galib¹, Prajapati PK¹

¹Dept. of R.S & B.K, I.P.G.T & R.A, Gujarat Ayurved University, Jamnagar, Gujarat, India

²Dept. of Basic principles, I.P.G.T & R.A, Gujarat Ayurved University, Jamnagar, Gujarat, India

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*Corresponding author

Dr. Rohit Sharma, MD Scholar, Dept. of RS & BK, IPGT & RA, Gujarat Ayurved University, Jamnagar – 361008 Gujarat, India.
Email: dhanvantari86@gmail.com.

ABSTRACT

Diabetes Mellitus (DM) is a major cause of morbidity and mortality, as it affects almost every system of human body. It is a life-style disorder, which neither spared developing nor developed nations. Treatment modalities, in particular to this disease depend from patient to patient. This kind of strategy is true in case of traditional medical system like Ayurveda. This individuality is decided on the basis of Prakriti, Vaya, Bala, Desha etc. and hence it is essential to know these factors for successful management of diseases. Considering these aspects; a survey has been conducted on patients of DM in Saurashtra region to know the impact of diet, lifestyle and etiquettes over the disease. In the present study, 250 diagnosed patients of DM from Saurashtra region of Gujarat, India were selected to assess major causes of the DM. The observation of the study reveals that, certain dietary and life style regimes of this region are responsible in manifestation of DM.

KEYWORDS: Assessment, Ayurveda, Diabetes Mellitus, Saurashtra, Survey.

INTRODUCTION

DM (Diabetes mellitus) is one of the diseases grouped under the category of life-style disorders¹ and it has been reported that, presently 61.3 million people are suffering from DM in India which is to reach 101.2 million by 2030².

Ayurveda consider DM as Madhumeha, which is a Tridosha predominant disease. Madhumeha literally means urine having appearance as Honey. Word Diabetes Mellitus is a Latin word which also means the same³.

Ayurvedic signs and symptoms of Madhumeha signify the metabolic abnormality as well as urinary tract pathology. Madhumeha is commonly presented with Prabhuta-Avila Mutrata⁴ (increased frequency and turbidity of urine).

DM has become a global health problem in spite of advances in modern science. Apathya ahaara (Dietetic incompatibilities) and Apathya vihaara (Lifestyle incompatibilities) both are the major risk factors for Madhumeha⁵.

In today's era, Apathya in terms of over nutrition in the form of carbohydrates, processed food with high sugar⁶, heavy oily and fatty diet⁷, increased stressful living and luxurious life style leading to reduced physical activity⁸ have been reported to influence the manifestation of Diabetes in a population.

Saurashtra region includes seven districts (Jamnagar, Junagarh, Rajkot, Bhavnagar, Porbandar, Surendranagar and Amreli). High incidences of DM has been observed at O.P.D. and I.P.D. level in I.P.G.T. & R.A., Jamnagar; based on which necessity of a well planned regional study was sensed, this could provide certain leads towards prevalence, role of life style and dietary factors in the manifestation of disease. Further, the results and observations may also provide leads for policy makers to take decisions in maintaining the health of the region.

Aims and objectives

To assess the role of Demographic profile, changes in life style habits and dietary factors in pathogenesis of DM in Saurashtra region.

MATERIALS AND METHODS

A survey performa was prepared, including the present and past medical history of first degree relatives and controls, medications, diet pattern and life style etc of patients in light of etiological factors explained for Madhumeha in Ayurvedic classics.

Inclusion Criteria

- Residents of Saurashtra region without any bar of Age, sex, cast and religion.
- Patients with symptoms of Madhumeha⁹ as well as DM¹⁰.
- Standard criteria of National Diabetes Data group and W.H.O. for DM was adopted (Adopted by American Diabetic Association)¹¹ which are as follows:

Symptoms of Diabetes + Random Blood Glucose \geq 200 mg/dl

or

Fasting blood glucose \geq 126 mg/dl

or

Two hours blood glucose \geq 200 mg/dl, during an oral glucose tolerance test

Exclusion Criteria

- Patients outside from Saurashtra region.
- Patients having Type 1 DM.
- Known case of T.B., AIDS and Malignancies.

Selection of patients

Patients with signs and symptoms of Madhumeha attending O.P.D. and I.P.D. of I.P.G.T. & R.A., Jamnagar, who fulfills the inclusion criteria were included in the survey.

Subjective Criteria

Demographic Profile

Data from the patients fulfilling the diagnostic criteria was collected including demographic profile.

Clinical Profile

A detailed history, Clinical examination and ancillary investigations were done on each patient after preliminary registration. The method of clinical examination includes both Ayurvedic and modern aspects. The observations of Clinical examination and laboratory investigations were filled in the Performa. Institutional Ethical Clearance has been obtained through No.PGT/7-A/Ethics/2010-11/1858 (Date: 01.09.2010) and the study has been registered at CTRI.

Laboratory Investigations

1. Routine Hematological examinations i.e. TLC, DLC, Hb%, ESR
2. Biochemical investigations i.e. FBS, PPBS, LFT, RFT, Lipid profile.
3. Urine investigations i.e. Routine and Microscopic

OBSERVATIONS AND RESULTS

Present survey was conducted in 250 patients with DM. Observations related to Age (Ayu), Gender (linga), occupation (vyavasaya), socioeconomic status, habitat (desha), family history, addiction (Vyasana), physical activity (sharirika shrama), type of diet (ahaara), frequency of food, dietetic incompatibilities (viruddhahara), sleeping habits (nidra), mental stress, chronicity, satmya, satva, agni, bala, physical and mental constitution (deha prakriti and manasa prakriti, rasapriyata, medication (bhesaja), Fasting Blood Sugar (FBS), Postprandial Blood Sugar (PPBS), classical symptoms and urine analysis are depicted in the pictures.

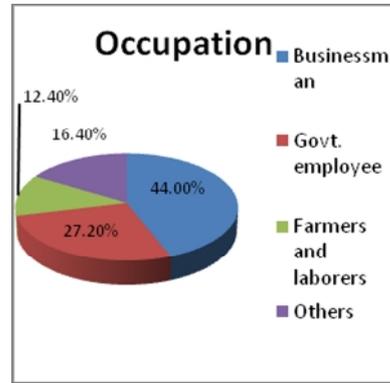


Figure 3

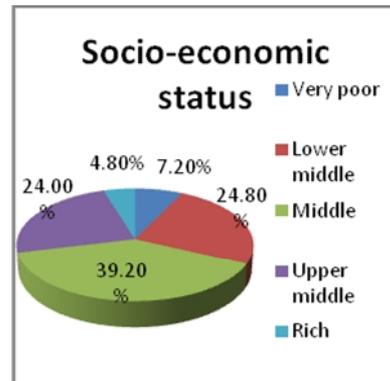


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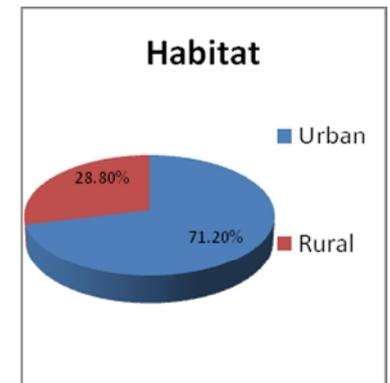


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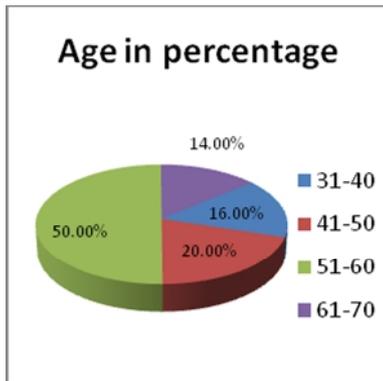


Figure 1

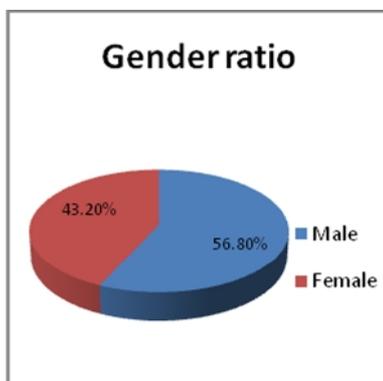


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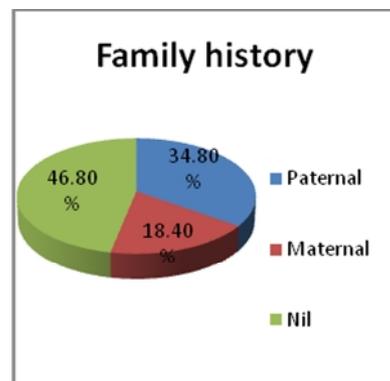


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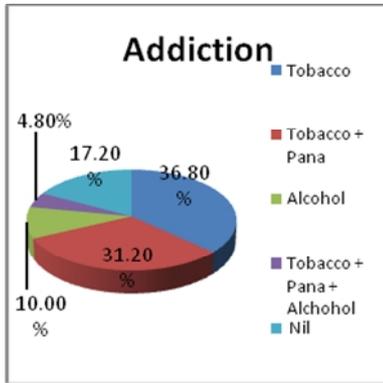


Figure 7



Figure 11

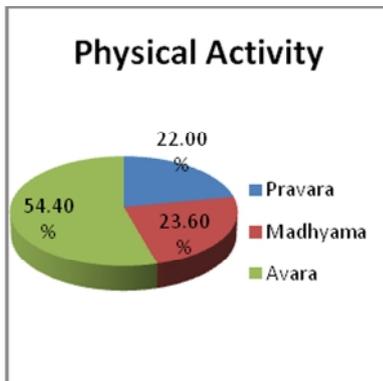


Figure 8

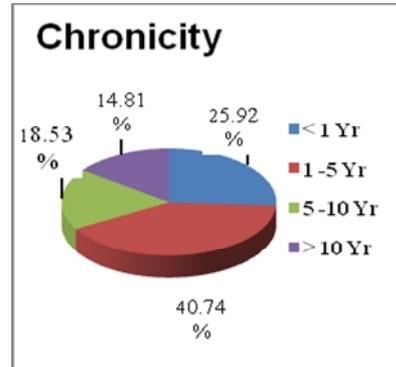


Figure 12

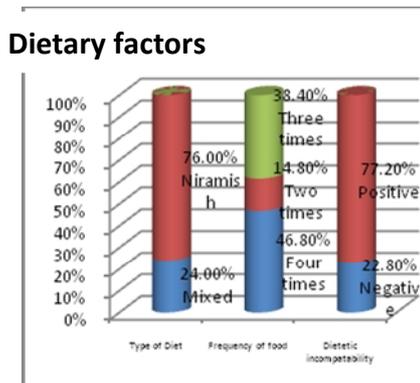


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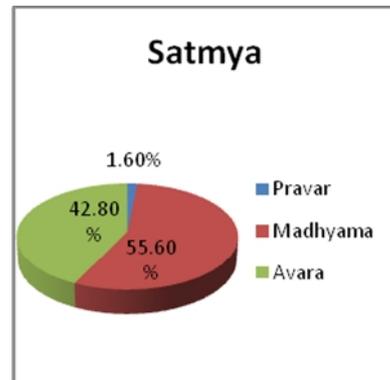


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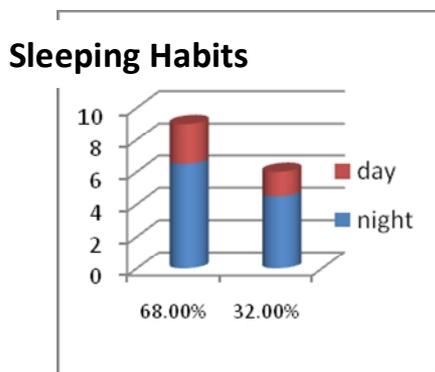


Figure 10

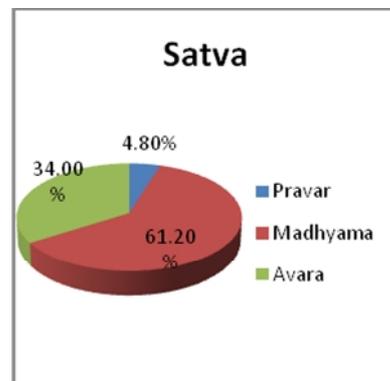


Figure 14

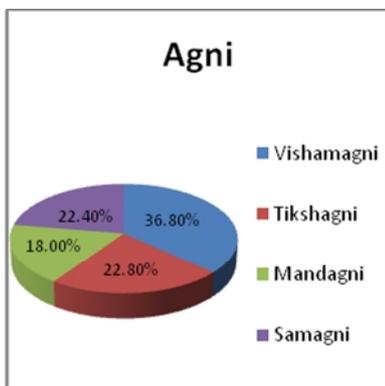


Figure 15

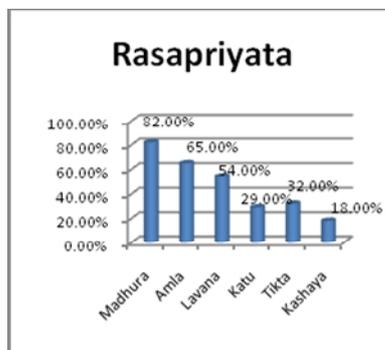


Figure 19

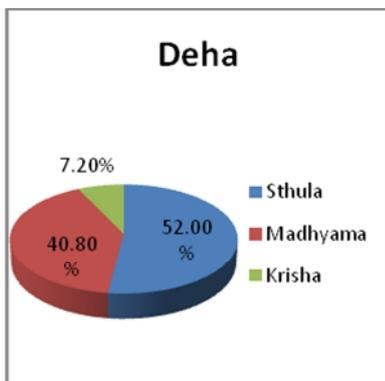


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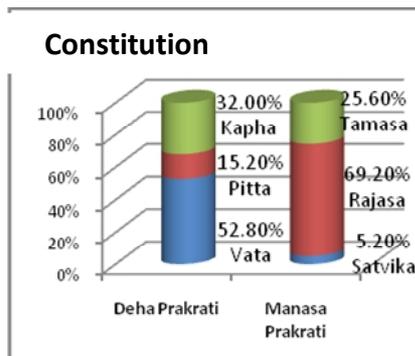


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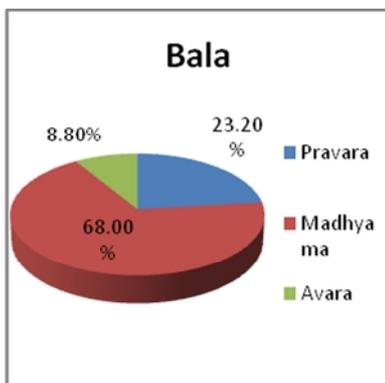


Figure 17

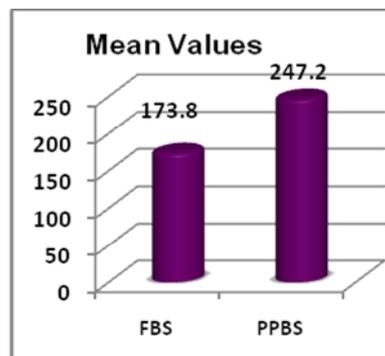


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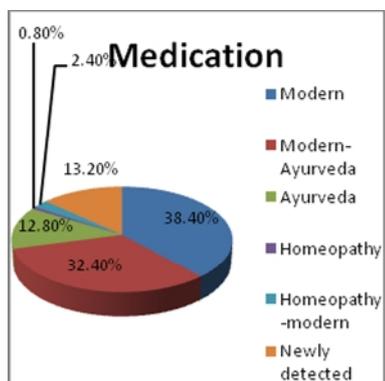


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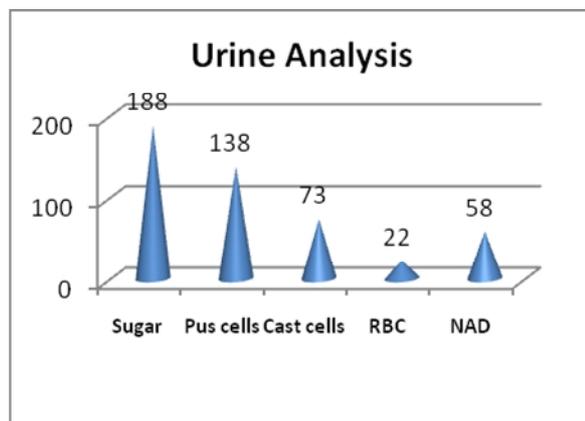


Figure 22

DISCUSSION

As the manifestation of the disease takes prolonged period, most of the subjects belonged to the age group between 51-60 years (Figure 1). At this particular age dietetic incompatibilities like Vishamashana, Viruddhashana; ignorance about Dinacharya e.g. Avyayama etc. becomes the leading cause for metabolic disorders. This is the period in life in which persons get exposed to variety of stress. Further stress causes imbalance in hormonal and nervous regulation of the body and makes the person susceptible to disorders including DM. It is also well known fact that DM more typically develops with increasing age. Worldwide estimation project that in 2030 the greatest number of individuals with diabetes will be 45-64 years of age¹².

In present survey, higher incidence observed in businessman and Govt. employee i.e. 44.00% and 27.20% respectively (Figure 3). Expansion of urban and industrial lifestyle spread the risk factor very fast. Lack of physical movement may become potential risk factor. The prevalence of type 2 DM is raising much more rapidly because of reduced activity levels¹³⁻¹⁴.

Figure 4 describes higher incidence of DM was found in Middle (39.20%) and Lower middle (24.80%) class. WHO predicts that currently, more than 70% of people with diabetes live in low- and middle income countries¹⁵. The survey revealed that urban population is more prone to DM (Figure 5). Population based survey in six largest Indian cities also extrapolated similar observations nationwide, applying a 4:1 urban: rural ratio for prevalence of diabetes¹⁶.

Maximum No. of patients i.e. 53.20% have history of DM in their 1st degree relatives (Figure 6). The diet and life style of parents may be one of the factors to higher prevalence of this disease. This may be compared with Beeja doshaja Madhumeha (Kulaja vikara) as mentioned in Charaka Samhita¹⁷. A positive family history confers a two to threefold increased risk to develop DM in first degree relatives¹⁸.

In 63.00% cases, one or different type of addiction (Alcohol, Smoking and Tobacco) was observed (Figure 7). Madyapana has the significant role as Nidana (etiological factors) of Madhumeha¹⁹. Vyavayi, Vikasi etc. ten Guna (properties) of Madya (Alcohol)²⁰ are opposite to Ojas, causes Tridosha dushti²¹ (vitiation) and kshubdhata (altered state) in Ojas²² which in turn can hamper Vyadhi Kshamatava (immunity); it may be one of the predisposing factors of Madhumeha. Smoking and alcoholism are considered as risk factors for DM²³.

Figure 8 depicts Avara Sharirika shrama (reduced physical activity) in the enrolled participants. Particulars in Saurashtra region most of people do not engage in any work between 1 P.M to 4 P.M. It infers they prefer to live more relaxed life. Sedentary lifestyle is said to be predisposing factor for Madhumeha²⁴.

People in Saurashtra region prefer to have their meals especially over oily and fried items outside during weekends. In Gujarat, a high dependence of milk products and oily foods coupled with genetic factors are responsible for Diabetes²⁵.

Adhyashana (Over eating) is found to be common in subjects of present survey region (Figure 9). Over eating is proved as a risk factor for DM²⁶.

The survey revealed that, the population of the region is fond of consuming articles predominant of sweet and fatty in nature. In addition, a peculiar habit of consuming food in small amounts frequently (Nasta) is also prevalent in the region. Such dietary habits have been emphasized in classics as factors of disease provocation in Ayurveda with special reference to Madhumeha²⁷. So Ahara, both in quantity and quality and pattern of intake will affect the health.

In the present survey, it has been found that, most of the patients are consuming Milk along with Khichadi (a type of food item predominant with Rice, Moong daal, flavoured with salt and spices); Gaathiya (a type of salty snack) with tea; cold drinks in lunch and dinner etc, which are few of the dietary incompatibilities explained in the classics of Ayurveda, which can be understood under the heading of Guna Viruddham²⁸. These Dietetic incompatibilities might be responsible in vitiation of Kapha and Pitta Dosha and Dushti of Mamsa and Meda Dhatu which may in turn cause Madhumeha.

Maximum No. of patients (68.00%) had sleeping habit of 8-9 hrs including day sleep (Figure 10), which indicates the prevalence of Divasvapna (day sleeping) in Saurashtra. Divasvapna is one of the causes of prameha²⁹⁻³¹. Atinidra (prolonged sleeping) is also a causative factor for Madhumeha³². Day napping is also proved as a risk factor for DM³³. Figure 11 indicates that sedentary life style and more stressful life can also lead to the disease³⁴.

Maximum No. of patients had Madhyama satva i.e. 61.20% followed by 34.00% and 4.80% had Avara Satva and Pravara satva respectively (Figure 14). Madhyama satva persons may not follow the dietetics and exercise regularly while the Avara Satva persons may not adopt the preventive measures; as a result they are more prone to the disease.

Maximum No. of patients were suffering from Vishamagni i.e. 36.80% (Figure 15). Most of the patients have Agnidushti which signifies the imbalanced state of Dosha. The digestion and metabolism depends on Agni.

In the present survey, maximum No. of patients were Sthula i.e. 52.00 % followed by Madhya Deha 40.80% and 7.20% Krisha (Figure 16). Maximum No of patients were obese because of disturbed metabolism. Habitual physical inactivity and obesity are the main risk factors for Diabetes Mellitus³⁵.

Madhyama bala is found in most of the patients (Figure 17) which also signifies the disturbed metabolism.

The data shows that 38.40% of the patients were taking Modern medicines, while 32.40% of patients were consuming Ayurvedic drugs along with modern drugs. Few were consuming medicines irregularly, while few were newly diagnosed (Figure 18). Most of the patients were not taking proper dietetics and exercises regimen.

More than half of the patients liked Madhura, Amla and Lavana rasa yukta ahara (Figure 19), which is mentioned in charaka as nidana of Madhumeha³⁶.

Maximum No. of patients were belonged to Vata-Kaphaja(55.00%), Pitta-Vataja (15.00%) and Kapha-

Pittaja(35.00%) Prakriti (Figure 20). Knowledge of Prakriti could help in deciding the dietetic regimen and exercises which may help in the management of disease. Maximum No. of patients had Rajas Prakriti in 69.20% and Tamas Prakriti in 25.60% (Figure 20). Rajasika and Tamasika Prakriti people are more prone to the Madhumeha manifestation because of wrong diet regimen and activities. A study of this type could provide an enormous public health impact and help the Authorities to take some possible actions to improve health conditions in that particular area. It provides an appropriate life style intervention that would be greatly helpful in preventing or postponing the diabetes prevalence.

CONCLUSION

The disorderly life style plays an important role for development of DM. In Saurashtra, the lifestyle, sleeping habits, addictions etc are the main reason which may produce DM. In this study maximum patients were between the 51-60 age groups, which show that it is very important to manage the disease in early stage by changing the diet and life style. Extremely important areas of research could be identifying the risk factors involved in DM in people of different geographical regions. DM is an endemic health problem; therefore, socioeconomic, behavioral and nutritional issues relating to DM should be highlighted and addressed.

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