

ROLE OF CYAMOPSIS TETRAGONOLOBUS IN DIABETES MELLITUS (MADHUMEHA)

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ABSTRACT

*Disease burden related to Diabetes Mellitus is high and rising in every country fuelled by global rise in prevalence of unhealthy lifestyle. WHO estimates that globally 422 million adults aged > 18yr were living with diabetes mellitus in 2014. Global pandemic principally involves type 2 diabetes and is associated with greater longevity, unsatisfactory diet, sedentary lifestyle and increasing urbanization. Modern medical science accepted the ayurvedic theory and described that disease is caused due to hereditary and metabolic disorders. It is found from studies that resident of Gujarat and other places where Guar Phali (Fruit of *Cyamopsis tetragonolobus*) is used as vegetable, prevalence rate is less than other state. In regard of its action it is said that it delays the rate of absorption of carbohydrate in GIT. Guar gum has been well studied for its ability to reduce post prandial blood sugar and dosage of insulin in diabetic patients therefore need of regular insulin dose will be minimal. Present clinical study was conducted to evaluate the therapeutic effect of drug in selected 33 cases of Type 2 Diabetes Mellitus and the result was highly significant.*

Key words: Diabetes Mellitus, Guar Phali, Lifestyle, Metabolic disorder

INTRODUCTION

Diabetes Mellitus is a clinical syndrome characterized by hyperglycemia caused by absolute or relative deficiency of insulin. Hyperglycemia has many causes but is most commonly due to Type 1 and type 2 Diabetes. Incidence of Type 1 and type 2 Diabetes are rising, it is estimated that in year 2000, 171 million people had diabetes and this is expected to double by 2030. This global pandemic principally involves Type 2 diabetes and is associated with greater longevity, obesity, unsatisfactory diet, sedentary lifestyle and increasing urbanization. WHO estimates that globally 422 million adults aged > 18yr. were living with Diabetes Mellitus in 2014. Lack of insulin affects the metabolism of carbohydrate, protein and fat, and can cause significant disturbance of water and electrolyte homeostasis and death may result from acute metabolic decompensation.

According to Ayurved, Diabetes mellitus belongs to type of *Prameha* i.e. Madhumeha. According to *Acharya Charaka* the symptoms of madhumeha are: urine is astringent and sweet

in taste, pale (pandu) in colour and dry (ruksha) urination frequently. Charaka says that the Oza is excreted in urine.

There are so many oral hypoglycemic agents available in modern medicine for this disease, but they are full of side effects. So here we come with a drug known as *Guar Phali* (fruit of *C. tetragonolobus*) which is found to have hypoglycemic effect and so hereby used for present clinical study.

AIMS & OBJECTIVES

- 1) To study about lifestyle related factors responsible for Diabetes Mellitus.
- 2) To evaluate the therapeutic effect of *Cyamopsis tetragonolobus* in Diabetes Mellitus.

MATERIAL & METHODS

- **Sample Size:** 33 patients.
- **Source of data:** Patients attending Diabetes clinic of S.V.S.P. Hospital, Institute of P.G. Education & Research in Ayurved, Calcutta.
- During study, diet given to all patients was 1800 kcal/day.
- In present study, patients complaining of following symptoms are included:
 - Excessive thirst
 - Excessive urination
 - Excessive appetite
 - Loss of weight
 - Pruritus vulvae
 - Falling vision
 - Legs pain at night
 - Recurrent infection
 - Burning sensation

DRUG DETAILS

Reference: Shaligrama Nighantu- Shak varga- page no.688

Drug: Guar Phali (Fruit of *Cyamopsis tetragonolobus*)

Family: Leguminaceae

Sanskrit name: Bakuchi, Goraksha, Phalini, Gorani, Dridhbija

Hindi name: Goward

Gujrati: Guwar

➤ Guna:

Rasa- Madhura

Guna- Ruksha/ Guru/ Sar/ Ruchikar

Virya- Shita

Vipaka- Madhura

Karma- Kapha-Vata Vardhaka / Pitta Shamaka

Mode of Action

Guar gum has been well studied for its ability to reduce post-prandial glucose level in both healthy and diabetic patients. It is confirmed by various studies that slowing of rate of absorption of carbohydrates is a major factor.

Dose & Administration

Guar gum powder was administered in dose of 5gm twice daily with plenty of liquid /milk just before principle meals. Patients were advised to pour this powder in liquid/ milk for about half hour before meal and take just before principle meals. It can also be used during meals by just sprinkling the powder on rice/ vegetables/ dal.

CLINICAL STUDY

All patients were examined thoroughly for a detailed history, state of health and presence of complications.

Laboratory investigations

These patients were subjected to following investigations:

- Post prandial blood sugar
- Urine for glucose and ketone bodies

Final assessment of results

Results were observed and analyzed as per following index of assessment:

Excellent	Complete relief of signs and symptoms Absence of glucose in urine Reduction of blood glucose (PP) more than 60mg%
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Good	Partial relief of signs and symptoms Reduction of glucose in urine Reduction of blood glucose (PP) up to 60mg%
Poor	No relief of signs and symptoms No change or increased level of glucose in urine No change or increased level of blood glucose (PP)

RESULTS

Response of treatment on clinical features:

Effect of drug was assessed on clinical features after two months of end of treatment.

Signs & Symptoms	No. of cases			
	Before treatment	After 30 days	After 60 days	Response of drug
Excessive thirst	21	14	6	71.42 %
Excessive urination	24	14	5	79.17%
Excessive appetite	25	14	7	72.00%
Loss of weight	23	20	17	17.39%
Pruritus vulvae	6	3	1	83.34%
Falling vision	26	26	23	11.54%
Legs pain at night	27	18	7	74.08%
Recurrent infection	13	6	5	61.54%
Burning sensation	16	16	5	62.50%

Response of treatment on Urine Sugar:

Urine sugar	Before treatment	After 15 days treatment	After 30 days treatment	After 60 days treatment
++++	15.15%	15.15%	9.09%	6.06%
+++	18.18%	3.03%	6.06%	6.06%
++	21.21%	21.21%	9.09%	6.06%

+	18.18%	12.12%	15.15%	9.91%
Nil	27.27%	48.48%	60.60%	72.72%

Response of *C. Tetragonolobus* on Blood Sugar (PP):

Results were recorded before and after treatment (15, 30 & 60 days). It is found statistically significant. In this series of study patients were more than 30. So, 'Z' test is applied to assess the statistical value. Here 'Z' value is $1.73 < \text{table value}=2.58$, that means medicine is significant.

Total effect of drug on Diabetes Mellitus

Response of drug was studied from various aspects. Total effect on patients was assessed in terms of excellent, good and poor response.

Criteria of response	No. of cases	Response in percentage
Excellent	25	75.75%
Good	5	15.17%
Poor	3	9.08%

DISCUSSION

Word *Madhumeha* is derived from two words i.e. Madhu + Meha. Madhu means *Madhura* and Meha means *Prasravi*, so that the word means excessive sweet urination.

Ayurvedic system of medicine is pioneer to describe about this disease, so far the history reveals e.g. term *Ashrava* which means excess secretion from urethra is introduced from vedic period.

According to Ayurved, Diabetes mellitus belongs to type of *Prameha* i.e. *Madhumeha*. According to *Acharya Charaka* the symptoms of *madhumeha* are: urine is astringent and sweet in taste, pale (*pandu*) in colour and dry (*ruksha*) urination frequently. *Charaka* says that the *Oza* is excreted in urine.

Etiology of *madhumeha* is related to *aahar* and *vihaar* which means to lifestyle. *Acharya Charaka* has clearly mentioned that ingestion of excessive, heavy, salty articles and newly harvested grains and dried meat of domestic animals and a person who is indolent, inactive, heavy weight,

over indulge in sleep and has sedentary habits, avoid all types of activities, all these factors are responsible for origin of madhumeha. In modern era, we can say that these factors are a part of unhealthy lifestyle.

According to modern medicine, environmental factors interact with genetic susceptibility to determine which people develop clinical syndrome. Type 1 DM is associated with profound insulin deficiency requiring replacement therapy. Type 2 DM is associated with impaired sensitivity to insulin and initially be treated without insulin replacement therapy.

Epidemiological studies show that type 2 diabetes is associated with overeating especially when combined with obesity and underactivity. Risk of developing type 2 diabetes increases tenfold in people with BMI > 30 kg/m². Obesity probably acts as diabetogenic factor in those who are genetically predisposed to insulin resistance and beta-cell failure. In addition to this, sweet foods rich in refined carbohydrate consumed frequently may increase demand for insulin secretion while high fat foods may increase free fatty acids and exacerbate insulin resistance.

Hence from above review of ayurvedic and modern literatures we can say that lifestyle factors are associated with development of diabetes mellitus.

CONCLUSION

Lifestyle diseases are linked with the way people live their life. Madhumeha is a disease entity caused by Aahaar-Vihaar, heredity, and due to Mandagni of Dhatu. Similarly, Diabetes Mellitus is also caused due to hereditary, environmental and lifestyle related factors. Drugs from herbal or herbo-mineral origin are used to manage this disease since ancient period. Guar gum is a dietary fibre that is found much effective to manage this disease. Rarity of this disease is observed in patients, who used this in their diet. Present clinical study was conducted on 33 patients of established cases of type 2 Diabetes Mellitus. Clinical study revealed that Diabetes Mellitus is more prone in 41-60 years of age, males, hindus, non-vegetarians, sedentary habits. Observations were followed for response of drug on clinical features, Urine sugar, Blood sugar (PP) and findings assessed as excellent, good and poor. Drug C. tetragonolobus (guar gum) was found much effective i.e. excellent (75.75%), good (15.17%) and poor (9.08%).

It is concluded from this clinical study that drug C. tetragonolobus (guar gum) is effective in controlling Diabetes Mellitus. There is no untoward side effect noted. All the patients were kept on 1800 kcal/ day diet.

It is advised to assess its long term effect, so further study is warranted.

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