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A Clinical Study On Role Of *Gramya Ahara* (Dietetics & Life Style) In Aetiopathogenesis Of *Prameha* (Type 2 Diabetes Mellitus) And Evaluation Of Hypoglycaemic Effect Of *Bhudhatryadi Yoga*

Dr. Anil Bhadoria¹, Dr Sakshi Gupta²

1- Associate Professor Govt. Ayurvedic Medical College Jammu

2- Medical Officer Department of AYUSH Jammu and Kashmir

ABSTRACT: Diabetes Mellitus is largely covered under the broad heading of *Prameha*. However, *Apathyanimittaja Prameha* (*Sushruta*), *Sthula Pramehi* (*Charaka*) and *Avaranjanya Madhumeha* described in *Ayurvedic* literature have similarity with Type-2 Non-Insulin Dependent Diabetes Mellitus (NIDDM). Type 2 diabetes prevalence is rising at alarming rates worldwide because of increased urbanization, high prevalence of obesity, sedentary lifestyles and stress, among other factors. Up to 80% of type 2 Diabetes is preventable by adopting a healthy diet and increasing physical activity. The summary published by “World Diabetes Congress” on 14th Nov.; 2009 “World Diabetes Day” represents that Diabetes affects 246 million people worldwide and is expected to affect some 380 million by 2025. In an effort to find out effective remedy *BHUDHATRYADI YOGA* was selected for this study. This drug is indicated for the treatment of *Prameha* in *ayurvedic* classics. Study was carried out in single group consisting of 30 patients. Results of the treatment were assessed over the period of 45 days. Patients were provided a proper diet chart planned according to the classics, keeping Glycaemic Index of the dietary substances & Calorie requirement of the patients. 6.66% patients obtained control over diseased condition 16.66% patients provided Marked Improvement, Moderate Improvement was observed in 40% of cases, 36.66% cases showed Mild Improvement in Signs and Symptoms.

Keywords- Diabetes Mellitus, *Bhudhatryadi yoga*, *Gramya Ahara*

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Corresponding Author : Dr. Anil Bhadoria,
Associate Professor Govt. Ayurvedic Medical
College Jammu, Email id-

anilrbadhori@gmail.com

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INTRODUCTION

Ayurveda is one of the most ancient medical sciences of the world. It conceives and describes the basic and applied aspects of life process, health, disease and its management in terms of its own principles and approaches. As man has entered in 21st century with modernization in each and every walk of life, he has also paid for it by living in several stressful psychological conditions.¹ The study is focused on Type-2 Diabetic patients only to understand its etiopathogenesis and actual line of treatment from *Ayurvedic* view point. The root cause of this increased prevalence can be traced out from every stage of life right from the childhood. The nurture of children has been changed now a day. The young generation either due to laziness or busy schedule doesn't pay enough attention towards exercise. Increased working hours, target oriented jobs are making the lives of young

generation distressful. Stress doesn't care about long term health unless we survive the immediate crisis. Dr. Neal D Barnard, from George Washington University School of Medicine and the president of the Physicians Committee for Responsible Medicine (PCMR), through a new research carried out by a team of American doctors suggested that diabetes can be dramatically checked and even cured by switching to a low-fat vegan diet.² A vegan diet is distinct from a vegetarian diet so far that it excludes not only meals but also all animal products like milk, butter, curd, cheese, egg etc. For India, this means going back to the traditional vegetarian way of life but without milk products which are rich in fat.³ In type 2 Diabetes, Insulin resistance is the main problem which is associated with cluster of conditions as obesity, hypertension and hyperlipidaemia which is a specific entity ('Metabolic Syndrome' or

‘Syndrome X’) is the primary defect.⁴ So apart from reduction in blood sugar level other benefits of going vegan diet include weight loss, hypertension and lower cholesterol levels. We cannot gain our victory over genetic factors but of course, by diet control & by modifying our lifestyle we can definitely prevent or control this disease. And rather than spending too much money on the treatment that do not work, it is wise to spend enough on preventing the disease & managing health problems with nutrition & lifestyle intervention as life style change is safer than oral anti diabetic drugs. Keeping in view, this delirious distribution in India, dietary & life style related causes and concept of vegan diet; here an effort has been made to assess the role of *Gramya Ahara* in the aetiopathogenesis and management of type 2 Diabetes.

AIMS AND OBJECTIVES

1. To assess the efficacy of *Bhudhatryadi yoga* in *Prameha* and its hypoglycaemic effect.
2. To study the impact of *Gramya Ahara* on the pathogenesis of *Prameha*.
3. To study the nature incidence and prevalence of *Prameha* (D.M) in the area where clinical study is being carried out.

MATERIAL AND METHODS

Selection of Case

- 30 Patients were selected randomly from OPD and IPD of Kayachikitsa Deptt. of Jammu Institute of Ayurveda and Research hospital.
- All the patients were clinically diagnosed cases of Diabetes Mellitus and were properly registered.
- Details of examination and investigations were carefully recorded in the proforma.

Inclusion Criteria

- Mild to moderate cases of Diabetes Mellitus having fasting blood sugar within range:-
Mild –126 to 140mg/dl
Moderate –140 to 160mg/dl
- Patients above the age group of 18 years and below 60 years were selected.
- Patients within 1 yr of diagnosis for diabetes mellitus were selected for the study.

Exclusion Criteria

- Patients with type 1 D.M.
- Type 2 D.M. patients who were insulin dependent.

- Patients with F.B.S. more than 160mg/dl & P.P.B.S. more than 220mg/dl.
- Diabetic patients with severe complications like cardiovascular diseases, Nephropathy, Retinopathy, Diabetic foot etc.
- Patients of Gestational diabetes.
- Diabetes due to endocrinopathy e.g. Cushing's syndrome, Hyperthyroidism, Acromegaly etc.
- Patients with certain genetic syndromes which are sometimes associated with diabetes mellitus e.g. Down's syndrome, Klinefelter's syndrome, Turner's syndrome etc.
- Patients suffering from terminal sickness.
- Patients who don't adopt or follow the instructions regarding life style modifications during the trial period.

Investigations –

Following investigations were carried out in all the patients.

- Fasting blood sugar (F.B.S) and Post prandial blood sugar (P.P.B.S.).
- Routine examination of blood like Hb%, T.L.C., D.L.C., E.S.R. , C.T, B.T. to exclude any pathology.
- Routine examination of urine.

- **Special investigation were done in few Patient ie.HbA_{1c}**

PLAN OF STUDY:

Patients randomly selected for the study were taken in single group. Research Proforma was filled. In the patients who were taking oral hypoglycemic drugs, blood sugar level at that time was taken as basal level. Study drug was administered . Effect of study drug was observed in relation to basal sugar level and sign and symptoms.

Design:

It is a single blind clinical study with a pre-test and post-test design. In this study, 30 patients diagnosed of diabetes mellitus of either sex were subjected to clinical study.

Intervention:

Bhudhatryadi yoga was orally administered in a dose of 3gm twice daily after meals for 45days.

Recently diagnosed patients, mild to moderate cases of type 2 Diabetes (NIDDM- *Apathya Nimittaja Prameha*) were kept on *Bhudhatryadi yoga* along with controlled diet and physical activity from *pathya* point of view.

These patients were provided a proper diet chart planned according to our classics.

Duration of study- 45days

Diet and exercise:

1. Patients were advised to take meal twice a day. Major portion of meal should consist of *Munga, Yava, old shali rice, chanaa, arahara*, leafy vegetables with a predominance of *tikta-kashaya rasa, mustard oil, Jambu, Amalaki* etc.
2. Avoidance of *Gramya Ahara* was advised.
3. Physical active life was also advised to patients to reduce body weight and increase sensitivity.
4. Patients were advised to avoid day sleeping, high caloric diet, preparations of sugarcane, curd etc

Following score pattern was adopted for sign and symptoms (i.e. Chief and associated complaints)

<i>Grade</i>	<i>Complaint</i>
0	No complaint
1	Presence of mild complaint
2	Presence of moderate complaint
3	Presence of severe complaint

OVERALL EFFECT OF THERAPY:

Effects of both the therapies were assessed on the basis of two parameters-

- Improvement in Signs and Symptoms
- Improvement in Blood Sugar Level

1. Improvement in Signs and Symptoms:

1. Control: Complete relief in signs and symptoms.
2. Markedly Improved: $\geq 75\%$ relief in signs and symptoms.
3. Moderately Improved: $\geq 50\%$ relief in signs and symptoms.
4. Mildly Improved: Up to 25% relief in signs and symptoms.
5. No Improvement: $< 25\%$ relief in signs and symptoms.

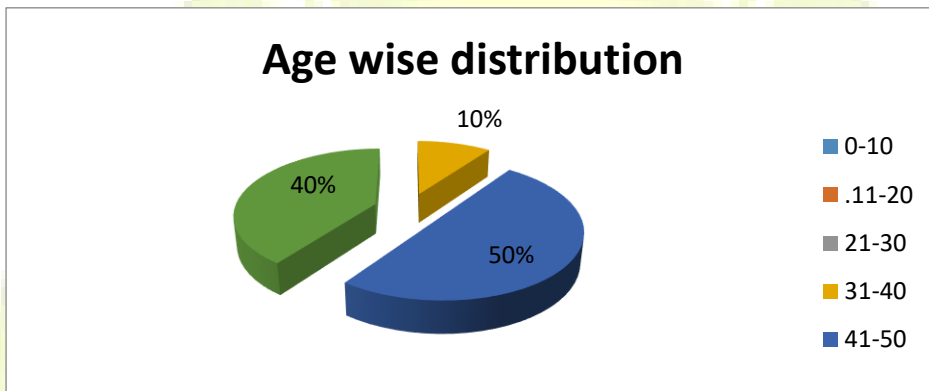
2. Improvement in Blood Sugar Level

Analyzed by above mentioned gradation pattern for Blood Sugar Level. Results obtained for each patient with the application of above-mentioned formula indicate efficacy of the drug in reducing the blood sugar level as compared to standard level of BSL [in the form of percentage].

3. OBSERVATIONS

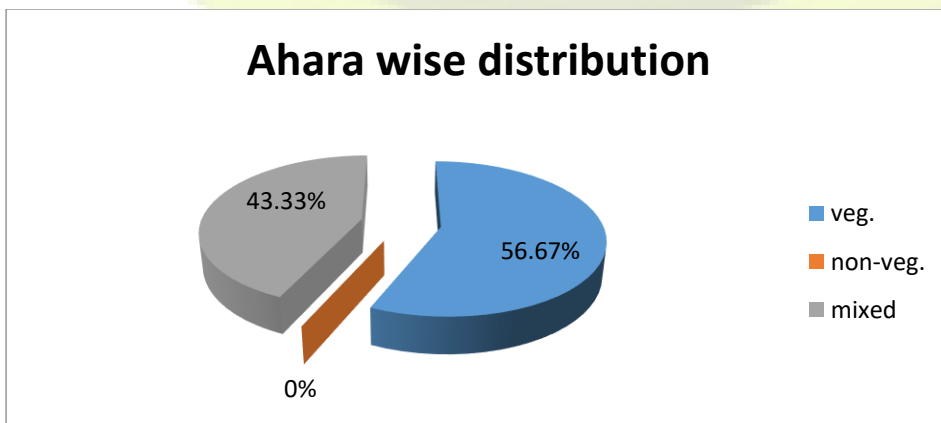
Total 30 patients were registered for the present study.

Graph 1. AGE:



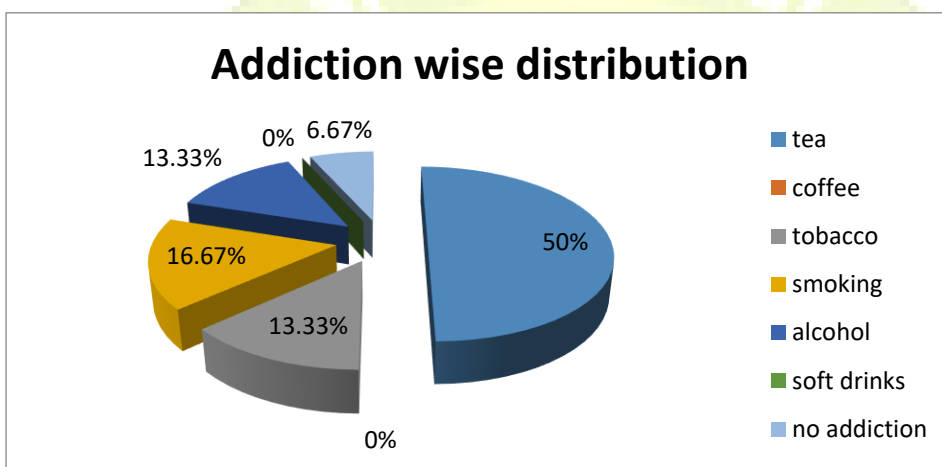
Out of 30 patients selected for present study, maximum no of patients i.e. 50% of patients were between age 41-50 yrs. 40% patients were between age 51-60 yrs while 10% of the patients were from age group 31-40yrs. From the data it is seen that incidence of Type 2 DM increases with the age of population. Decreased physical activity could be the cause behind this finding. Generally, it is observed that people above age of 40 yrs suffer from DM. This observation supports the fact that Type 2 DM has maturity onset as total 90% of people [50%+40%] were between age group 41-60 yrs.

Graph 2. AHARA



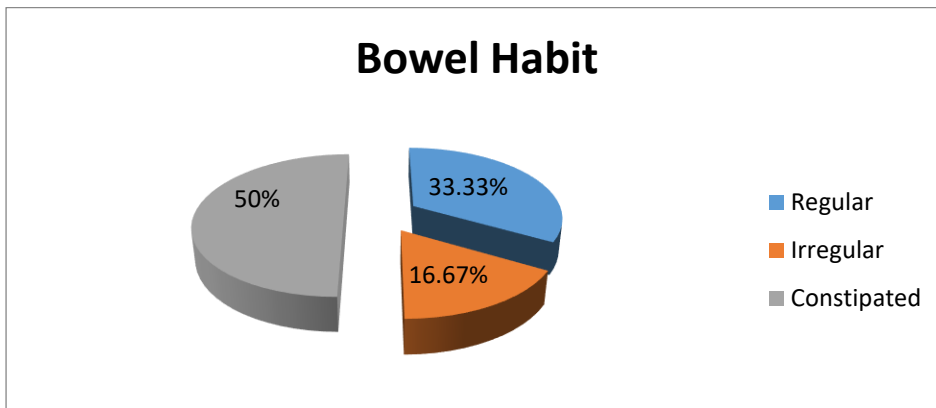
56.67% of patients were Vegetarian and 43.33% of them were consuming mixed i.e. Veg. And Non-veg. Diet. Cases shown mixed diet group were basically dependent on Vegetables who occasionally take Non-vegetarian diet for variation. Non-judicious intake of food is the cause of *Prameha*. e.g., In people who take Vegetarian diet, it is observed that they compensate their calories of protein by taking *Payansi*, Ghee etc. carbohydrate and fat rich food articles. This contributes to pathogenesis by affecting *agni* of patient.

Graph 3. ADDICTION



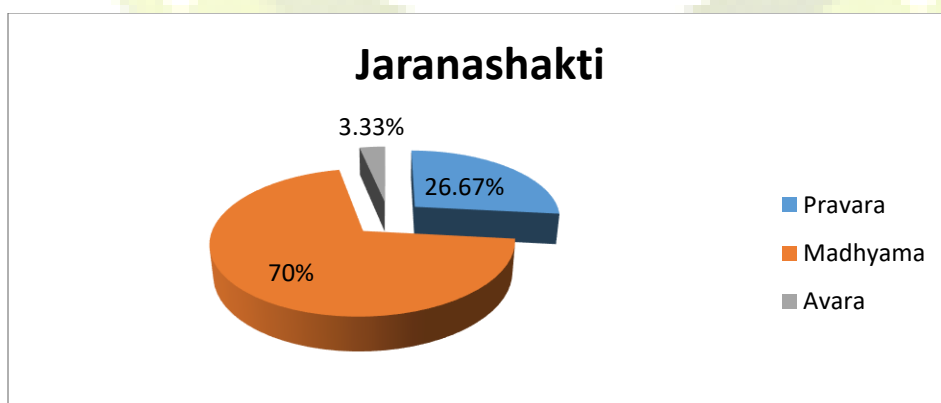
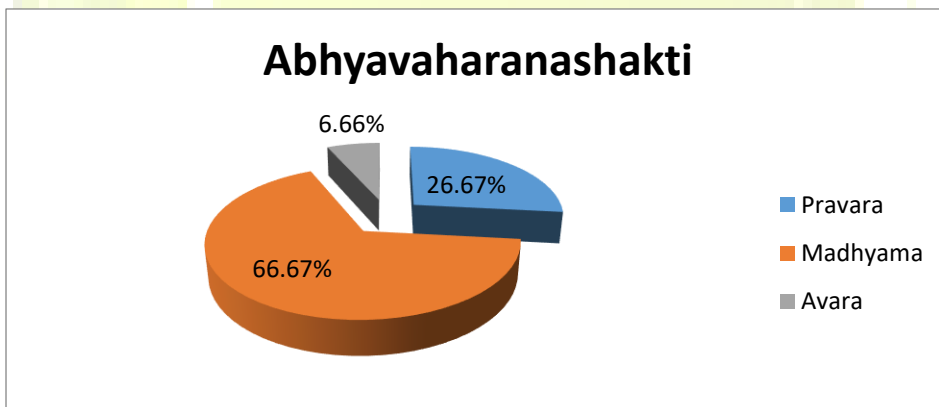
Maximum no. of patients i.e. 50% were habitual to Tea, 13.33% were addicted to Tobacco, 16.67% to Smoking, 13.33% were addicted to alcohol and 6.67% of them were having No Addiction. Smoking is estimated to increase the incidence of diabetes by 1.5-3-fold. The mechanism of this effect is not known but may be that smoking contributes to upper body obesity, which is associated with the metabolic syndrome of central obesity, insulin resistance, glucose intolerance or overt diabetes. Moreover, smoking increases oxidative stress which antagonize the insulin action and leads to diabetes mellitus. Alcohol may improve insulin sensitivity when consumed in small amounts. At higher levels of intake, alcohol may interfere with insulin-mediated glucose disposal, causing insulin resistance.

Graph 4. BOWEL-HABIT:



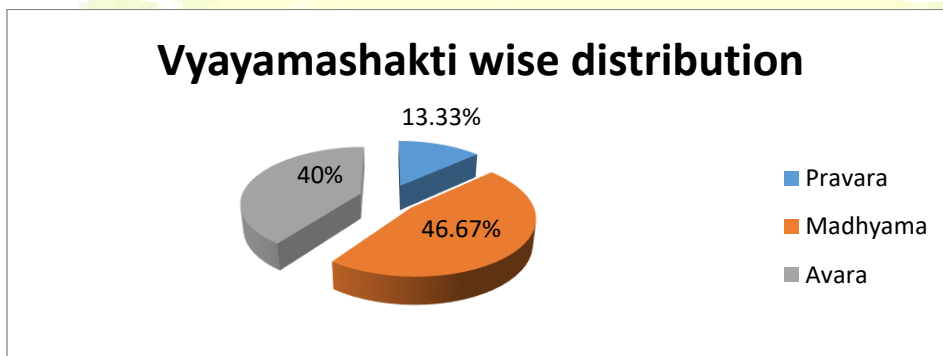
50% of patients were having Constipated Bowel , 33.33% were found to have Regular Bowel Evacuation and 16.67% of them were having Irregular Bowel Evacuation. *Baddhapurishatva* is one of the complication of *Prameha*. Long standing disease can affect the normal Bowel-habit of patient. Long standing DM may affect the motility and function of GI system.

Graph 5. AHARASHAKTI:



Out of 30 patients *Pravara Abhyavaharana Shakti* was found in 26.67% of patients, *Madhyama Abhyavaharana Shakti* was found in 66.67% of patients and *Avara Abhyavaharana Shakti* was found in 6.66% of the patients. *Pravara Jaranashakti* was found in 26.67% of the patients, *Madhyama Jaranashakti* was found in 70% and *Avara* in 3.33% of the patients. Patient's *Aharashakti* is diagnosed by observing these two things. In present study, patients with *Madhyama Abhyavaharana* and *Jarana Shakti* were more. It indicates that *Pachakagni mandya* was not there but *Dhatwagni* and *Bhutagni* were hampered widely, which ultimately leads to *Ama* formation.

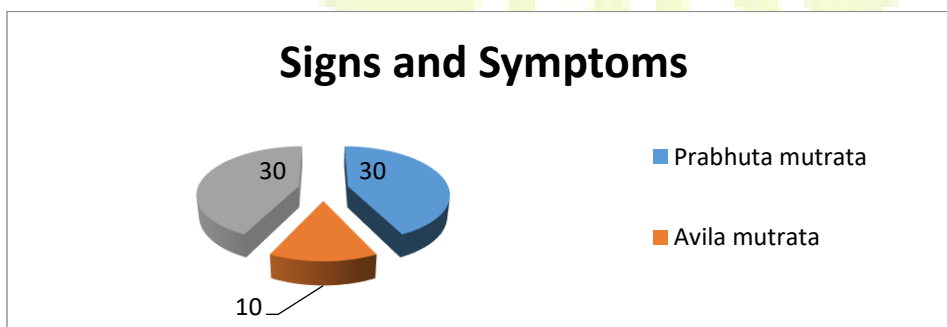
Graph 6. VYAYAMASHAKTI:



Madhyama Vyayamashakti was found in 46.67% of the patients, *Avara Vyayamashakti* was found in 40% and *Pravara Vyayamashakti* in 13.33% of the patients. Maximum patients had *Madhyama Vyayama Shakti* which shows that most of the patients suffering from this disease can not perform laborious work due to *Daurbalya* which is due to less uptake of glucose through muscle and fat though having hyperglycemia.

EFFICACY OF TREATMENT

Graph 7. MAIN SIGNS AND SYMPTOMS:



Prabhuta mutrata, Trishnadhikya and Gala-talu-shosha were found in 100% of patients which suggests the uncontrolled diseased condition. Though the presence of symptoms was 100% but the degree of severity was varying from patient to patient. *Avila mutrata* was found in 33.33% of patients.

OVERALL EFFECT OF THERAPY (RESULT)

- **Improvement in Signs and Symptoms:**

RESULTS	Patients	Percentage
Controlled	2	6.66
Marked Improvement	5	16.66
Moderate Improvement	12	40
Mild Improvement	11	36.66
Unchanged	0	0.00

2 patients (6.66%) assessed as controlled and 5 patients (16.66%) as Markedly Improved. Moderate Improvement was seen in 12 patients (40%) whereas Mild Improvement was observed in 11 patients (36.66%). All patients responded to treatment to some extent and no patient assessed as unchanged.

Improvement in Blood Sugar Level

RESULTS	F.B.S.		P.P.B.S.	
	Patients	Percentage	Patients	Percentage
Controlled	7	23.33	3	10
Marked Improvement	10	33.34	6	20
Moderate Improvement	9	30	9	30
Mild Improvement	4	13.33	10	33.33
Unchanged	0	0	2	6.67

Control in F.B.S. was achieved by 7 patients (23.33%) and that of in P.P.B.S. by 3 patients (10%). Marked Improvement in F.B.S. was observed in 10 patients (33.34%) while 6 patients (20%) for P.P.B.S. was categorized under this grade. Moderate Improvement in F.B.S. and in P.P.B.S. was observed in 9 patients (30%). Mild improvement in F.B.S. and in P.P.B.S. was observed in 4 patients (13.33%) and 10 patients (6.67%) respectively. P.P.B.S. of 2 patients (6.67%) remain.

DISCUSSION

Prameha has been mentioned as *Aanushangi Vyadhi* by *Maharishi Charaka*.⁵ *Chakrapani* explained the term *Aanushangi* as ‘*Punarbhavi*’, means a disease that presents itself again and again. *Gangadhara* has explained *Aanushangi* as a disease that remains attached forever.⁶ All these factors themselves are sufficient to get a hint about the dreadfulness of disease. It may be the one reason that *Maharishi Sushruta* included it under *Astamahagada*.⁷ The rising burden of Type 2 diabetes and other non-communicable diseases which has occurred with modernization can be understood in the context of ‘epidemiological transition’. Rapid socio-economic development and

coca colonization have resulted in a life style transition from traditional to modern. In virtually all populations, higher fat diets and decreased physical activity have accompanied the benefits of modernization.⁸ Exercise has been engineered out of our daily lives, both in the work place & leisure. These lifestyle changes when combined with increasing longevity form the basis of the dynamic Type 2 diabetes epidemic that we are witnessing today. The western lifestyle must have unmasked the effects of pre-existing genes because the consistent result has been diabetes within a few decades. The syndrome of diabetes mellitus is largely covered under the broad heading of *Prameha*. However, *Apathyanimitaja Prameha* (Sushruta), *Sthula Pramehi* (Charaka) and *Avaranjanya Madhumeha* (Vagbhata) described in *Ayurvedic* literature have similarity with Type-2 Non Insulin Dependent Diabetes Mellitus (NIDDM).⁹ Here the study is focused on Type-2 patients only to understand its etiopathogenesis, *Samprativighatana* of disease and then actual line of treatment from *Ayurvedic* view point. On the basis of clinical study of observations and, effect of treatment on signs & symptoms, bio-

chemical parameters, following discussion is put forth.

DISCUSSION OF OBSERVATIONS

On *Prabhuta mutrata*, it is seen that up to 71.50% relief was obtained. The result was statistically highly significant ($P < 0.001$). The effect of *Bhudhatryadi yoga* on *Prabhuta mutrata* can be thought upon as follows: *Bhudhatryadi yoga* is dominant in *Tikta - Kashaya rasa & Ruksha guna* among which *Tikta* rasa is said to be “*kleda upashoshana*” while *Kashaya rasa* to be “*sharira kledasya upayokta*”. The word *Ruksha* itself indicates dryness which in turn means lack or decrease of *Kleda*. Thus, all the three dominant properties show *Kleda* reducing effect. *Bahu drava sleshma* is the *dosha vishesha* and *Kleda* is one of the *dushya vishesha* in *Samprapti* of *Prameha* so the dominating three properties directly affect both the *dosha* and *dushya vishesha* and hence effectively counteract the *Samprapti*. *Samprapti vighatana* is told to be complete treatment in *Ayurveda*. Since *Prabhuta mutrata* is the chief complaint (*Pratyatma lakshana*) of *Prameha* and *Bhudhatryadi yoga* highly significantly reduces this complaint and thus useful remedy for treating *Prameha*.

AVILA MUTRATA:

During the course of treatment 22.72% relief was seen which is insignificant at $p > 0.05$.

TRISHNADHIKYA AND GALA-TALU-SHOSHA:

Trishnadhikya and Gala-talu-shosha were relieved up to 57.72% which are highly significant statistically ($P < 0.001$). *Trishnadhikya & Gala talu shosha* occur due to *Pitta vridhhi* and *udaka kshaya* which may be pacified by *Tikta, Madhura & Kashaya rasa* of the *Bhudhatryadi yoga* which affects by correcting *Pitta dosha* or due to *trishna nighrahana* effect of *Bhumiamalaki*. Polyuria is commonly found in diabetics. Through polyuria lot of body fluid is excreted. So, to compensate, body demands for liquid, this is occurred as polydypsia. Since *Bhudhatryadi yoga* significantly reduces polyuria, it in turn mechanically also reduces Polydypsia. In same manner it also shows effect on *Gala talu shosha*.

EFFECT ON BLOOD SUGAR

Reduction in raised F.B.S. level was up to 26.11% ($P < 0.001$), while reduction in raised P.P.B.S. level was up to 20.91% ($P < 0.001$). By observing the results, it can be concluded that *Bhudhatryadi yoga* has better effects in reducing blood sugar level.

OVERALL EFFECT OF THERAPY

6.66% patients obtained Control over diseased condition. Marked Improvement was seen in 16.66% patients. 40% of cases presented Moderate Improvement and 36.66% were categorized as Mildly Improved after the treatment. No patient was found as Unchanged.

Improvement in Blood Sugar Level

Assessment of each patient was done by taking into consideration both F.B.S. and P.P.B.S. values separately as both the values have their own significance. 23.33% of total cases obtained Control grade in their F.B.S. and 10% obtained Control grade in P.P.B.S. values while 33.34% showed Marked Improvement in F.B.S. and 20% in P.P.B.S. values. Moderate Improvement in both F.B.S. and in P.P.B.S was observed in 30% cases. Mild Improvement in F.B.S. was seen in 13.33% cases and 33.33% in P.P.B.S. In 0% and 6.67% cases F.B.S. and P.P.B.S. values remained unchanged. In present study, some patients were taking some oral hypoglycaemic agents [OHAs] and still were having high blood sugar level despite of their high dose. This therapy helped to improve their BSL nearer to standard level. Many patients were in favours of taking

only Ayurvedic treatment and got better results by this therapy

PROBABLE MODE OF ACTION:

As far as mode of action is concerned, Ayurvedic view has already been discussed in Drug Contribute. According to modern medical science, the mechanism of action of the drug may be one of these:

1. By decreasing absorption of glucose from the gut.
2. By increasing peripheral utilization of glucose.
3. By stimulating Beta cells to produce more insulin.
4. By increasing insulin sensitivity.

The drug may be acting through one or more of the mechanisms mentioned above. The precise mechanism is yet to be searched out and studied.

CONCLUSION

Rasyana is the therapy which establishes the age (*VAYAHSTHAPAN*), increases the life span (*AYUSHKAR*), Intelligence (*MEDHA*) and strength (*BALA*) as well as it enables the person to get rid of the diseases. On the other hand, *Gramya Ahara* is the root cause of all the diseases. *Prameha* can be compared to Diabetes Mellitus because of the similarities in both diseases in respect to aetiology, pathogenesis, clinical features, complications and treatment. The laboratory methods have revolutionized the diagnostic approach towards the disease.

Now the disease can be identified and managed in very early stages without waiting for the *pipeelikas* to get attracted to the *mutra*. *Ayurveda* has also recognized much earlier about the disturbance of lipid metabolism in *Prameha*. The present study was conducted with limited time, limited facilities and limited number of patients. A study of larger group of patients may help to comprehend the mode of action of the trail drug. Further study must be placed on the basis of *Mutra* as *Vishesha*

Parikshyabhava. *Pathya* is the foundation stone of the treatment as far as diabetes mellitus is concerned. *Pathya* should be emphasized when dealing with management aspect. *Pathya* provided significant results in the present study. In the future, additional studies may be performed to take the present issue further in a proper perspective and future possibilities of reduction of modern drug requirement.

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Conflict of interest :- Nil

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