



Case Study

AYURVEDIC MANAGEMENT OF DIABETES MELLITUS (DM) AND DIABETIC NEUROPATHY: A CASE STUDY

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ABSTRACT

Diabetes is a burning problem of modern world and is associated with multiple complications. All oral hyoglycemic drugs and insulin used in modern medicine only help to lower blood sugar of body. The biological medicines are only available treatments which have limited effect and carrying many serious adverse effects. **Purpose:** The conventional medicine has its own limitation in this disease condition, it only help to lower blood sugar level of body and in a long run it has shown its side effects. They neither able to correct the pathology nor helpful to protect vital organs of the body and to prevent further complications. Ayurvedic treatment approaches are helpful in this disease. With the changing demand and awareness among these days, the role of Ayurveda is an emerging reality. **Brief case history:** A 49-year-old, married, Hindu male patient visited PD Patel Ayurvedic Hospital on 9th November 2021. He had been diagnosed with type 2 diabetes above 11 years and received medication for this. He was taking Tab. Metformine since last 11 years. He had chief complains of *Madhuryamasyata*, *Karapadadaha*, *Pipasadhikya*, *Mootraadhikya* since last 11 years, and other associated complains were *Kshudha Vriddhi*, *Atichinta*, and *Nidravridhi* since last 4 months. He had gradually increased body weight in last year 2 years. He had been admitted and treated with *Virechna karma* and *Basti chikitsa* and oral Ayurvedic medicines for one month. After one month of treatment, he is continuing oral medicines only and he regularly comes for following up in OPD. Now on the second follow up patient had much improvement in above symptoms. His blood sugar level and weight were also reduced significantly. **Result:** He got an excellent result with complete relief from all symptoms as well as marked reduction in objective criteria (lab investigation) within 1 month.

INTRODUCTION

Diabetes mellitus is one of the most common chronic diseases and become a formidable health problem in this millennium affecting more than 120 million individual world-wide. India has world's largest epidemic of diabetes in the world- an estimated 40 million and changes in life style are putting more at risk. Because of the associated risk of stroke, coronary artery disease, and renal failure, diabetes is ranked among top five killers in most countries.

Blindness, ulcers leading to amputation and terminal kidney disease are complications. Despite improved understanding of its pathogenesis and the identification of the various risk factor, prevention of the disease and its complications still challenge the medical world.^[1]

DM is a major health pandemic effecting mankind since ancient times. An absolute or relative absence of insulin causes an established complicated metabolic disease with very high blood glucose levels. Due to bad dietary pattern and sedentary lifestyles, which are the primary etiological causes for this disease, the incidence of diabetes has significantly increased in recent years.

A series of metabolic disorders known as diabetes mellitus (DM) are characterized by chronic hyperglycemia brought on by abnormalities in insulin

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production, action, or both. Increased thirst (polydipsia), increased hunger (polyphagia), and frequent urine (polyuria) are all signs of this hyperglycemia (high blood sugar). Diabetes mellitus can cause a number of consequences, including diabetic ketoacidosis, non-ketotic hyperosmolar coma, heart disease, stroke, kidney failure (nephropathy), foot ulcers, retinopathy, cataracts, and glaucoma, if it is not managed.

Diabetes has been controlled with dietary restriction, exercise, oral hypoglycemic drug such as – insulin sensitizers, alpha glycosidase inhibitors, glucagon like peptide 1, sulphonureas, and biguanides are the main contains of oral hypoglycemic treatment but maintain glucose, control in these patients remains a difficult task. Although Ayurvedic medication has been said to be less harmful and more effective, it has been effectively used to regulate other long-term problems of diabetes mellitus as well as bring blood sugar levels back to normal, heal damaged pancreatic cells, and reduce or avoid the development of microanoiaptic lesions.^[2]

Diabetic neuropathy is a degenerative and destructive condition of the peripheral nerves as an early and common long-term complication of diabetes mellitus. It is a very common and long term complication of diabetes mellitus. The majority of individuals with peripheral neuropathy are initially asymptomatic, with minor abnormalities such as loss of vibration perception, light touch, two-point discrimination, and temperature sensitivity on examination.^[3] They generally report numbness and tingling sensations after becoming ill, often in a classic "stoking-glove" pattern. Diabetic peripheral sensory neuropathy is characterized by axonal degeneration of myelinated or demyelinated axons, as well as thickening of the Schwann cell basal lamina. The involvement of micro vascular damage in diabetic peripheral sensory neuropathy is especially important to understand.^[4]

In Ayurved classics, there are different aspects of *Madhumeha* described. It would be known that ancient sages categorically emphasized on its prognostic status and complications. Most of the data described there on are akin to the findings established by modern researchers. Involvement of three basic humors of the body, the tissue systems and the body fluids, decline *Bala-masma*, the manifestation of no symptoms, less symptoms, all the symptoms, sudden onset early manifestation, late manifestation, non-curability, development of carbuncles and other complications are to be considered minutely. While *Charak* and *Vagbhata* considered *Madhumeha* as some variant of *Vatkia Prameha*. *Sushruta* enumerated that all the *Pramehas*, if not treated in time, leads to *Madhumeha* and become non-curable.^[5] Nowadays,

patients who cannot be treated at all reflecting the insulin-dependence stage can be considered under this group. *Vagbhata* while defining *Madhumeha* specified that the urine becomes sweet and so does the body.^[6] *Charak* also classified the *Madhumehi* patients as *Atisthula* and *Krishna* and observed that the new born baby may be *Madhumehi* due to defect in sperm or ovum.^[7]

Prameha belongs to the *Santarpanajanya Tridoshaja Vyadhi*. According to *Sushruta*, excessive *Pramehotpadaka Aahara-Vihara* causes vitiation of *Prakruta Vata, Pitta, and Kapha*, which mixes with *Medodhatu*. These corrupted *Dosha* and *Dhatu* descend down the *Mutravaha Srotas* and localize at *Basti*, where they result in *Prameha*.^[8]

Ayurveda states that *Madhumeha (Vataja Prameha)* is *Asadhya* i.e., incurable, however it can be managed with treatment. Further *Charak* while specifically enumerating the etiopathogenesis of *Madhumeha* emphasized the role of excess intake of sweet and fatty diet, sedentary lifestyle and occupations, lack of exercise or labour and stated that due to obstruction of channels of *Vayu, Oja* is taken to urinary bladder.^[9] *Vagbhata* also describes the condition of *Arishtalinagam* indicating decline in certain activities.^[10] These views reflect the degeneration or destruction of the insulin secreting cells in the pancreas and/or diminished secretion of the insulin.

There are descriptions of hundreds of herbal, herbomineral drugs and *Panchakarma* procedures for the treatments of *Madhumeha*. The treatment schedule consists of *Pathya Aahara, Vihara, and Shamana Chikitsa*.

The diabetes peripheral neuropathy can correlate in Ayurvedic classics, symptoms like *Suptata* (numbness) and *Daha* (burning sensation) in body parts, especially in the feet and hands are described as *Purvarupa* of *Prameha* and *Daha* is also described among the *Upadrava* (complications) of *Prameha*. These features are frequently seen in diabetic sensory polyneuropathy. There is involvement of *Vata* and *Pitta Dosha* in diabetic neuropathy.^[11]

Ayurveda is the answer as its benefits are all more significant for patients who were not responding to conventional drugs. Ayurvedic medicine prove to be economical are fruitful and without any side effect. That is why plenty of natural resources, which have been indicated in the wisdom of Ayurvedic system of medicine are, yet to be proved in the field of diabetes mellitus. Research, which could have benefits hundreds of diabetes patients, has reminded confident to scientific discussions.

Case Report**Patient Information (Vedana Vruttanta)**

A 49-year-old, married, Hindu male patient visited PD Patel Ayurvedic Hospital on 9th November 2021. He had been diagnosed with type 2 diabetes for 11 years and received medication for this. He used Tab. Metformin from the very first diagnosis. He had chief complains of *Madhuryamasyata*, *Karapadadaha*, *Pipasadhikya*, *Mootraadhikya* since last 11 years, and other associated complains were *Kshudha Vriddhi*, *Atichinta*, and *Nidravridhi* since last 4 months. According him, the weight is increased in the last years. He had been admitted and treated with, *Virechna Karma* and *Pathydi basti* and oral Ayurvedic medicines viz., for one month. After one month of treatment, he is continuing oral medicines only and he regularly comes for following up in OPD. Now on the second follow up, patient had much improvement in above symptoms. His blood sugar level and weight were also reduced significantly.

Personal history revealed that the patient is vegetarian but used to take extra oily and fatty diet, with a habit of intake of junk food and diurnal sleep. Frequency of micturation is 8-9 times during day and 4-5 times at night, bowel habits are irregular with mild constipation (once/1-2 days, hard stool) and the patient has no addictions. Past-history revealed that patient was suffering from type 2 diabetes mellitus for 11 years. While he was taking Metformin, he had a very irregular medication and blood sugar monitoring schedule. He also has both paternal and maternal side positive family histories of diabetes mellitus.

The general examinations of the patient revealed dryness of tongue, as for vitals, pulse rate was 84/min, respiratory rate of 18/min and blood pressure of 120/80mm of Hg. His body weight was 82kg, height 175cm and BMI of 26.8Kg/m². His respiratory system examination, gastro-intestinal examination, cardiovascular examination, central nervous system examination and locomotor examination did not uncover any abnormality.

His blood investigations on 2nd September 2013 showed fasting blood sugar level as 276mg/dl (70-110mg/dl Normal), post prandial blood sugar level as 294mg/dl (70-140mg/dl normal) and glycosylated haemoglobin (HbA1c) as 8.4% (4-6% normal). As

above symptoms the patient was diagnosed as a case of Diabetes mellitus type-2.

METHODS

Madhumeha is *Vata-Kapha Pradhan Tridoshaja Vyadhi*. It has two types: *Sahaja* and *Apathyanimittja*. In contrast to *Sthula*, *Avaranjanya*, and *Santarpanjanya*, which can be associated with *Apathyanimittaja Madhumeha*, other types explained in many classical books such as *Krishna*, *Dhatukshayajanya*, and *Apatarpanjanya* can be correlated with *Sahaja Madhumeha*. Since this patient had *Apathyanimittaja Madhumeha*, it is imperative to treat him with medications that target the primary pathology, such as *Meda Dhatu*, *Kleda*, *Kapha*, and *Meda Dhatvagni*, as well as those with *Deepana*, *Pachana*, *Lekhana*, *Vata-Kaphahara*, and *Medohara* characteristics.^[12]

Clinical features of *Prameha* correlates with diabetes mellitus. Diabetes mellitus contributes significant burden to the global population as it is leading cause of morbidity and mortality worldwide. It is chronic, metabolic disease characterized by elevated levels of blood glucose which leads to serious damage to the heart, blood vessel, eyes, kidneys, nerves. Most common type observed among all the patients of DM is type 2. Cases and the prevalence of diabetes have been steadily increasing over the past few decades. About 422 million people worldwide have diabetes, majority of them living in low-and middle-income countries and 1.6 million deaths are directly attributed to diabetes each year. According to WHO Diabetes Mellitus is a heterogeneous metabolic disorder characterized by a common feature of hyperglycemia with disturbance of carbohydrate, fat, and protein metabolism.

Disease management with Ayurveda entails a prescription of personalized diet, lifestyle, predominantly herbal medicines, and systemic cleansing therapies.

Pradhana Vedana

Patient complains of increase frequency of micturation with excessive hunger, since 6 months and burning sensation in both feet.

Purva vedana vruttanta: No relevant history found

Kula vyadhi Vruttanta: Father and mother were said to be diabetic.

Vyakthika vruttanta

Ahara	Vihara	Mansika
Vegetarian	Sleep disturbed	<i>Chintya</i>
<i>Madhura, Singhdha</i>	Sedentary lifestyle	
Irregular meal time	Bowel - 1 time/day	
	Micturition - 8-9 times in a day and 4-5 times in a night	

Samanya Pariksha

- Appearance – Fair
- Pulse rate - 75/min
- B.P. - 130/90mm hg
- R.R. - 17/ min
- Weight- 82 kg
- Height- 175 cm
- Temperature – Afebrile
- R.S. - Bilateral Air entry clear
- C.V.S. - S1S2 heard, no abnormal murmur heard
- C.N.S. - Conscious and oriented

Rogi Pariksha

- Prakruti: PittaKapha
- Sara: Madhyama
- Satva: Madhyama
- Samhanana: Madhyama
- Kostha: Krura
- Agni: Vishama
- Pramana: Madhyama
- Aharashkti: Madhyama
- Jaranashakti: Madhyama
- Vyayamashakti: Madhyama
- Vaya: Vriddha
- Jihwa: Saama

Ashtavidha pariksha

- Nadi: Vata Kapha
- Mutra: 8-9 times (day), 4-5 times (night)
- Mala: 1 time/day
- Jihwa: Saama
- Shabda: Spashta
- Sparsha Samshittoshna

- Druka: Prakruta
- Akrti: Madhyama

Diagnosis

Saupdrava Madhumeha (diabetes mellitus and diabetic sensory poly neuropathy).

Medical Management Strategy Treatments undergone

1. *Snehapana* is a process of full body internal and external lubrication by drinking ghee and oil as well as massaging the oil on without any other oral intake.
2. *Abhyanga* is a procedure which is performed with heated medicated oil massage.
3. *Bashpasweda* is a steam chamber in which the patient sits while steam from a boiling *Nirgundi Patra* concoction is emitted.
4. *Virechana Karma* is the procedure in the sequence of *Panchakarma* (Ayurveda Detoxification Program) that involves using medicines that have a laxative effect, mainly aimed at reducing *Pitta dosha* and toxic accumulation in the gastrointestinal tract, liver, and gall bladder).
5. *Udvartana* is a powder massage often used for slimming and treatment of obesity that can be done daily.
6. *Basti Chikitsa* is a type of medication given by enema, aiding in diminishing extra *Vata Dosha* present in the body. *Vata* is responsible for the elimination and retention of urine, sperm, feces, bile, and other excreta.

Table 1: Therapeutic Intervention

From date	To date	Procedure	Treatment medicine
10/11/21	15/11/21	<i>Snehapana</i>	<i>Panchatikta ghrita</i>
16/11/21	18/11/21	<i>Abhyanga + Sarwang Bashpasweda</i>	<i>Narayan taila + Nirgundi patra</i>
18/11/21		<i>Virechana karma</i>	<i>Dindayal churna-5gm+Eranda Sneha-50ml (Draksha kwath)</i>
19/11/21	23/11/21	<i>Sansarjan karma</i>	-
24/11/21 To 5/1/2022		<i>Udvartana</i>	<i>Triphala Choornam + Lodhra Churna (in Usnajala)</i>
		<i>Niruha basti (Pathyadi dm)</i>	<i>Niruha basti -320ml (Pathyadi dm)</i> 1) <i>Atibalamola kwath</i> 40ml (twice a day) 2) <i>Bhumiamalaki churna</i> -3gm (trice a day) 3) <i>Meshahsrungivati</i> -4 tab (twice a day) 4) <i>Mameghakhaghana vati</i> - 4 tab (twice a day)

RESULTS

The patient's lab values, symptoms, and BMI changes over the course of 9 months can be viewed (Tables 2 and 4).

Patient Condition on Treatment Day 1 (10/11/2021).

General Findings

Blood pressure (BP): 130/80mmHg

Pulse: 82/minutes

Weight: 82kg

Physical Examination

- Abdomen: Soft, non-tender
- Cardiovascular: S1, S2 heard
- Pulmonary: Normal breath sounds bilaterally
- Diagnosis. *Madhumeha* (type 2 diabetes mellitus)
- *Prakriti* (physical diagnosis). *Kapha-Vata (Dosha)*

Patient condition at the completion of his treatment on 12/22/2015

General findings

- BP: 110/80 mm Hg
- Pulse: 80/minutes
- Weight: 82 kg

Clinical examination

- Abdomen: Soft, no organomegaly
- Cardiovascular: Normal S1, S2
- Pulmonary: Normal breath sounds bilaterally

Table 2: Investigations Done Before and After the Treatment

Investigations	Before Treatment	After treatment
Hematological		
Hb	13.3gm%	13.7gm%
Tc	8700 cu/mm	8700 cu/mm
Dc	68/25/04/03	68/25/04/03
Platelet count	275000	275000
RBC	4.57 million/micro	4.57 million/ micro
Hba1c	7.25	6.81%
Urine Routine	Before Treatment	After Treatment
Ph	6.0	6.0
Specific Gravity	1.015	1.015
Blood	--	--
Protein	--	--
Urine Micro		
Pus	2-4/hpf	2-4/hpf
Specific gravity	1-2/hpf	1-2/hpf
Blood	--	--
Protein	--	--
Biochemistry	Before treatment	After treatment
FBS	276	130
Pp2bs	294	150
Liver function test	Before Treatment	After treatment
Total bilirubin	0.9mg/dl	0.9mg/dl
Direct bilirubin	0.3mg/dl	0.3mg/dl
Indirect bilirubin	0.60 mg/dl	0.60mg/dl
SGPT (ALT)	37 u/l	37 u/l
SGOT	25 u/l	25 u/l
ALP	86	86
Total protein	Before Treatment	After treatment
Total protein	6.80 gm/dl	6.80 gm/dl
S. albumin	4.70 gm/dl	4.70gm/dl
S. A/G Ratio	2.24	2.24
Lipid profile	Before Treatment	After Treatment
Total cholesterol (CHO-POD)	171mg/dl	160mg/dl

Triglyceride (GPOPOD)	129mg/dl	117mg/dl
HDL cholesterol (Enzymatic)	51.0mg/dl	51.mg/dl
VLDL- cholesterol (Immune inhibition/Mod. IFCC Method)	25.80mg/dl	25.80mg/dl
LDL cholesterol (calculated by Friedwald formula)	94.20mg/ dl	94.20mg/dl
Cholesterol/HDL Ratio (calculated)	3.35mg /dl	3.35mg/dl
LDL/HDL Ratio (Calculated)	1.85mg/dl	1.85mg/dl
Renal function test	Before Treatment	After Treatment
Serum Creatinine	1.20 mg/dl	1.20mg/dl
Blood urea	14mg/dl	14mg/dl
Thyroid	Before Treatment	After treatment
T3	1.22ng/dl	1.22 ng/ dl
T4	6.756ug/dl	6.754ug/ dl
TSH	1.170 uIU/mL	1.170 uIU/mL
Cystain -C	0.9	0.9

Treatment Conclusion

There were no adverse events during the patient's treatment course. He had also numbness in his big toes and feet region. He was advised to continue the internal and external treatments and medications for a period of 1 month with follow-up on 30/1/2022. He attained *Samyak Lakshana* of *Virechana*, which means that he successfully completed his treatment with desired disease reversal.

Table 3: Patient's clinical outcome

S.No.	Clinical Outcome Measures	Before consultation	After <i>Virechan karma</i>	At the end of Ayurvedic Treatment	Fourth Month Review status
1	Physiological status Coating on tongue	Present	Absent	Absent	Absent
2	Excessive eating	Present	Absent	Absent	Absent
2	Weight (kg)	82	80	72	65
3	BMI (Kg/m ²)	26.8	26.1	23.5	21.2
4	Lethargy	Present	Absent	Absent	Absent
5	Loss of concentration	Present	Absent	Absent	Absent
6	Numbness in big toes	Present	Absent	Absent	Absent

Table 4: Patient's Laboratory Results

S.No.	Lab Investigations	10/11/21 Before Consultation	1/1/1 On the first day of Ayurvedic Treatment	1/1/1 At the end of Ayurvedic Treatment	Fourth- month Review Status	Sixth month Review status
	Oral hypoglycemic agent					
1	Tab. Metformin	1-0-1	½-0-½	Nil	Nil	Nil
2	FBS	276	276	200	127	124
3	FUS	4+	4+	++	NILL	NILL
4	PPBS	294	290	190	150	150

Therapeutic Intervention

The treatment given during hospitalization is as follows:

Upon the admission patient was started with *Snehapana* with *Panchtikta Ghrtia* was given. After *Sneshapana Sarvanga Abhyanga* and *Sarvang Swedana*

was given for 3 days. On third day after *Abhyanga* and *Baspasawedana Virechana* was given with *Dindyalchurna*- 5gm and *Eranda Sneha*- 50ml with *Anuapan of Draksha Kwath*. After *Samyak Virechna*, *Samsargana Karma* was followed. On completion of *Sansarjana Karma* orally *Atialamoola kwath*- 40ml (twice), *Bhumiamalaki Churna*- 3gm twice a day, *Meshashrungivati*- 4 tab (twice a day), *Maejhakaghanavati*- 4 tab (twice a day). Everyday *Sarvanga Abhyanga* and *Sarvang Swedana* was performed followed by *Niruhabsti (Patyadi-Dm)*. And dietary precautions were advised. This following treatment was continued for 30 days. *Shamana Aushadha* were also given which are mention in below (Table 4).

Medications

Internal Medications

1. *Atialamoola kwath*- 40ml (twice), (empty stomach)
2. *Bhumiamalaki churna* - 3gm (twice a day)
3. *Meshashrungivati* - 4tab (twice a day)
4. *Mamaejakghanvati* - 4 tab (twice a day)

External Medications

Diet and exercise regimen for the 6 months following treatment and follow up:

Include

1. Follow timely meal schedule. Have freshly prepared warm food.
2. Churned butter milk and boiled-cooled water to drink.
3. Cooked vegetables.
4. Broken wheat, millets, and jowar, bajra should be included in the diet.
5. Vegetables - *Methika* (fenugreek), *Patola* (pointed gourd), *Rasona* (garlic),
6. *Mudga* (green gram), *Kulaththa* (horse gram)
7. Fruits - *Jambu* (jamun), *Amalaki* (goose berry), *Dadima* (pomegranate)
8. Oil - *Atsai* and *Sharshapa* mustard).
9. Spices - *Maricha*, *Saindhva* (rock salt), *Hingu* (asafoetida), *Haridra* (turmeric), *Ardraka* (ginger).
10. Moderate levels of exercise daily and walking and *Paranayam*.

Avoid

1. Refrigerated, deep oily fried, salty, spicy, packet food items.
2. Curd, paneer, cheese, sweets, and sour foods. *Dugdha*, *Dadhi*, *Takra*, *Ikshuvikara*, *Guda*, *Pista-Anna*, *Nava-Anna*, *Urada*, *Gramya*- *Audaka*- *Anoopa* *Mansa*, *Naveen Sura* *Avum Madhya*, *Adhyasan*, *Viruddhasana*, *Kapha-Meda Vardhak Ahara*, *Madhur-Amla-Lavana Rasadi ahara*.

3. Reduce excess usage of potato, cauliflower, green peas, rajma (kidney bean), channa (chickpea), peanut, and maida (white flour) products.
4. Daytime sleeping
5. Exposure to cold water and cold weather.

DISCUSSION

Prameha Nidana is of two types *Sahaja* and *Apathya Nimitaja*. *Apathya nimitaja* can be further divided into *Aharaja Nidana*, and *Viharaja Nidana*. *Aharaja Nidana* includes excess use of new grains and other pulses prepared in *Ghrita*, *Guda* and different preparation milk and sugar cane. And meat soup of different *Anupa* animals etc. All *Aharaja Nidana* are *Kapha* and *Medo Vardhaka*. According to *Vihara*, *Prameha's* causes include too much sleep, a lack of exercise, worry, grief, and anxiety.^[13]

In the manifestation of the disease diabetic neuropathy, the functions of peripheral nerves are impaired, which are mainly accredited to the *Vata dosha*, it is clear that the *Vata* acts as a receptor, as well as a stimulator. In other words, it initiates the functions in the body and perceives the stimulations from the external environment.

In this case, we found the etiological factor to have excessive intake of dietary items of *Madhura rasa*, *Snigdha Ahara*, irregular meal time, disturbed sleep during night, sedentary lifestyle, stress. Assessment of etiological factors is first step to prevent the disease from occurring. After that patient was advised to avoid *Nidana* and take strict diet according to Ayurveda. Diet mainly included avoiding of *Madhura*, *Snigdha Ahara* and including fiber rich green vegetables and cereals. This all reduces diabetes, delay sugar digestion and absorption. *Nidana Parivarjana* is advised during and after the treatment.

In these patients, a well-planned Ayurveda food and medication regimen together with regular exercise may assist to improve glycemic control. The two therapeutic forms of *Prameha*, known as *Sthoola* and *Krishta/Durbala*, are primarily diagnosed for correcting *Shodhana* or *Shamana* treatments.^[14]

Shodhana therapy includes selective oleation, mild fomentation, therapeutic emesis or and purgation as well as decoction enema. Before internal or external oleation, *Rookshana* (desiccating therapy) is mandatory in *Sthoola Pramehi Chikitsa*. The best *Rookshana* method is *Udwarthana* (dry power massage) in *Prameha* patients.^[15] *Lamghana* (depletion of *Medus* and *Kapha*) can be achieved by *Upavasam* (controlled fasting) or *Rookshahara* (fat free diet). Treatment explained in Ayurveda for morbid obesity in general can also be adopted in Type 2 DM. The dietary articles should be guru but consists of minimal nutritional value like fibre/cellulose rich diet. The

Abhyanga alleviates *Vata* and improves the sensory perception of the skin.

Even though light dietary articles ensure *Langhana*, the *Rookshana* can also be achieved by *Seka*, *Vatatapa Seva*, *Vyayamam* these all interventions work in body as *Langhana* therapy.

Bhummyamalaki having properties like *Pitta-Kaphahara* and *Dahahara* and also useful in diseases associated with the *Vata Dosha*. It is also described as *Mutraroga Nasini*, *Pittameha Nasini* in the classics.^[16] These drug increase renal blood flow, improves GFR, decrease inflammation and hence help in reducing urea, creatinine and reduces urinary excretion of protein.

Atibala has *Sita*, *Madhura*, *Balakrita* properties and also *Tridosahara* properties. In addition it has *Rasayana* effect which reduces all the three *Dosas*.^[17] *Atibalamula Kwatha* and *Bhummyamalaki Churna* are show significant improvement in reducing symptoms of DM and improves the general health.

Once the diabetes mellitus has developed then blood sugar level should be controlled by using *Madhumehahar* drugs and its complications should be prevented by using specific drugs and *Rasayana* as above mentioned.

The internal Medicine used in this study is therapeutically indicated in *Prameha*. It has *Tikta Rasa*, *Laghu Guna*, *Ushna Veerya*, *Katu Vipak* and subsides *Kapha* and *Pitta*. *Mamejaka* is said to have anti-diabetic and anti-oxidant property. Medicine contains *Mamejaka* extract (8 parts), *Mamajaka Churna* (2 parts), *Pippali* (*Piper longum* 2 parts), and *Ativisha* (*Aconitum heterophyllum*, 2 parts). *Mamejaka ghanavati* has explained in *Bheshaja Samhita* under *Gutika* and *Guggulu Kalpa*.^[18]

Both treatments, the Ayurvedic treatment protocol of oral drugs and external therapies were found to be effective. The combined use of Ayurvedic external and internal treatments is effective. The respective use of suitable *Rasayana* drugs may useful for the disease progression.

CONCLUSION

Diabetes mellitus is a disease of chronic nature and affect not only an individual but also family and society economical. It hampers the economy and man power. It is now established that most of the hypoglycaemic drugs have a series of side effect. This treatment have given excellent results and within 14 days of starting the treatment, raised blood sugar levels dropped to pre diabetic range while after 14 days, the sugar levels were in normal range in end of the treatment plan. Ayurvedic disease care involves prescribing a specialized diet, way of living, mostly herbal medications, and systemic cleansing therapies. Future initiatives should consider how to customise

population care to address unique patient needs while harnessing advancements in clinical information systems and care integration to achieve the best possible diabetes management and prevention in the long run. Long follow up and a greater number of patients are required to reach any conclusion but, in this case, it can be stated that this treatment is a hope for the patients with diabetes resistance to conventional medicine

Outcome and Follow Up

Patient was assessed before and after the treatment as well as after follow up after 6 months of discharge. Reduced frequency of urine, after one month of treatment, he is continuing oral medicines only and he regularly comes for following up in OPD. Now on the tenth follow up patient had much improvement in above symptoms. His blood sugar level and weight were also reduced significantly after the treatment.

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