



## Prevention and management of Diabetes Mellitus in Ayurveda

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### ABSTRACT

Diabetes mellitus is a common and very prevalent disease affecting about 25 % of world population. India has the largest Diabetes population in the world with an estimated 41 million people, amounting to 6% of the adult population. Diabetes mellitus is a clinical syndrome characterized mainly by hyperglycaemia due to absolute or relative deficiency of insulin. Lack of insulin affects the metabolism of carbohydrate, protein and fat and causes significance disturbance of water and electrolyte homeostasis. Increased demand of Ayurvedic medicine due to high cost and innumerable side effects of allopathic medications is of vital importance. Panchakarma also have a major part to do with prevention and management of Diabetes as these are purificatory procedures which removes the stagnated, vitiated Doshas out of body in a natural way. Now a day many Ayurvedic herbal or herbo-mineral formulations have been used in the treatment of Diabetes mellitus throughout the world. As prevention is better than cure hence prevention of disease with Pathyakara Aahara and Vihara accomplished with Yoga and Naturopathic procedures has major role in preventing the type II Diabetes, hence this is an attempt to explain the prevention and management of Diabetes in Ayurved. Details will be discussed at the time of paper presentation.

**KEYWORDS:** Herbo-mineral, Panchakarma, Pathyakara Aahara, Vihara

### INTRODUCTION

Diabetes mellitus (DM) affects 5-6% of global adult population. "World Diabetes Congress" summarized on 14<sup>th</sup> Nov.2009; that Diabetes is expected to affect 380 million by 2025. Every 10 seconds a person dies from Diabetes related disorder. India has the largest Diabetes population in the world with an estimated 41 million people, amounting to 6% of the adult population. As age progresses, in either sex, the probability to get Diabetes increases. In the population that is above 60 years of age, approximately 18.3 percent have Diabetes<sup>1</sup>.

Ayurvedic point of view Diabetes is a disease which is caused due to Nidana Sevana that aggravates Kapha and vitiates Meda Dhatu in the body<sup>2</sup>. According to Penta-element theory both Kapha and Meda are Jala tattva predominant. Greater omentum and kidneys are the Moolasthanas of Meda dhatu. Hence when Jalatwa is disturbed patient suffers from excessive urination and excessive thirst. For Kapha predominance major sight is Urah i.e. chest and Amashaya i.e. Stomach. In Trividha Avastha Paka, Achha Pitta is said to be prepared in Adho Aamashaya which can be considered as both gastric secretions and secretions from common bile duct as it is again watery in nature. If the Kapha is vitiated then ultimately Pitta also gets malformed. Hence for the management of disease reconstruction of vitiated Pitta and

Kapha is required. All causative factors described in Ayurvedic classics prove that it is a life style disorder and which may have a genetic predisposition<sup>3</sup>. This is a disease of digestive power derangement, it is accepted in all texts unanimously that due to excess Meda (fat) all Strotasa (channels) gets blocked which leads to frequent hunger and thirst to the patient. The digestive power at the same time is not sufficient to digest whatever heavy food patient consumes out of false hunger. This in turn aggravates the symptoms. Hence this vitiated excess Kapha and Meda will cause further complications of disease. The management lies predominantly in the triad of decreasing Kapha subsequently deranged and malformed Meda Dhatu, increasing or correcting digestive phenomenon and maintaining good state of mind.

A number of lifestyle factors are known to be important for the development of type 2 Diabetes. In one study, those who had high levels of physical activity, a healthy diet, did not smoke, and consumed alcohol in moderation had an 82% lower rate of Diabetes. When a normal weight was included the rate was 89% lower. In this study a healthy diet was defined as one high in fiber, with a high polyunsaturated to saturated fat ratio, and a lower mean glycaemic index. Obesity has been found to contribute to approximately 55% type II Diabetes and decreasing consumption of saturated fats and trans-fatty

acids while replacing them with unsaturated fats may decrease the risk.

Environmental toxins may contribute to recent increases in the rate of type 2 Diabetes. A positive correlation has been found between the concentration in the urine of bisphenol A, a constituent of some plastics, and the incidence of Type 2 Diabetes.<sup>4</sup>

Also Acharya Charaka says regular bathing and walk will help in reducing the probability of occurrence of Madhumeha<sup>5</sup>. Further elaborating the fact he claimed that Sthaulya (obesity) and Karsha (Emaciation) both are dependent on two factors mainly i.e. food habits and sleep of the individual<sup>6</sup>. As the matter of fact it is already proved that obesity leads to Madhumeha.

Pathyakara Aahara Vihara, Pranayama, Yogasanas etc. play vital role in preventing Diabetes mellitus. Therefore the present paper has been designed with following aims and objectives i.e. to focus upon purificatory procedures (Panchakarmika and Shatkarmika) and herbo-mineral formulations effective in managing type II Diabetes along with Pathya Aahara and Vihara (Yogasanas) as Ayurvedic treatment regime for diabetics and to chart out a non invasive, cost effective, easily adoptable but effective changes, according to Ayurved, in lifestyle and diet style for prevention of disease.

## **MATERIAL & METHODS:**

The whole study is based on the literary material viz. Brihat Trayis, theses related to topic, Rasashastra Ayurvedic classics, and information from contemporary modern texts, available resources from the internet. Methodology comprised of Panchakarma procedures – Vamana & Virechana, Naturopathic purificatory procedures, Pathyakara Aahara & Vihara, Yogasanas followed by relative Pranayama -Anuloma Viloma, Nadi shodhana, Bhastrika, Bhramari, Shitali, Shitkari and herbal and herbo-mineral formulation pertaining to management of Diabetes. Majority of Research works taken are now property of Gujarat Ayurved University.

## **OBSERVATIONS:**

### **RESEARCH WORKS DONE WITH PANCHAKARMA PROCEDURES ON DIABETES MELLITUS:**

Management of Madhumeha (Diabetes mellitus) with Shodhana and Shamana Chikitsa- Patel A *et al.* Ahmadabad<sup>7</sup>. 28 patients were divided into two groups with 14 patients in each. Group A comprised of Shodhana Purvaka Shamana Chikitsa in which Deepana Pachana by means of Trikatu Churna and then Abhyantara Snehapana with Triphala ghrita was carried out, followed by Virechana with Abhayadi Modaka. Then trial drug Vidangadi Ghanvati

with Ushnodaka was administered 12 weeks. Group B received only Shamana Chikitsa with Vidangadi Ghanvati from Yogratanakara, Uttarardha, Prameha Chikitsadhikara, given orally with Ushnodaka. The dissertation concluded that Shodhan Purvaka Shamana Chikitsa is better than Shamana Chikitsa.

A comparative study on the role of Basti therapy and Pramehaghna drugs in the management of Madhumeha (Diabetes mellitus) –Pawar A *et al.* Jamnagar<sup>8</sup>. 29 patients of Madhumeha were divided into three groups. Group-I Oral Group: Pramehaghna Ghana Vati - 2 gm thrice a day with luke worm water for 11/2 month. Group-II Basti Group: Pramehaghna Basti for 16 days including Niruha and Anuvasana (Kalabasti) and Group-III Placebo Group: Placebo capsule - 500mg thrice a day, Strict diet control and exercise. The thesis concluded that Avaranjanya Madhumeha can be correlated with Diabetes mellitus type-II. Basti and Pramehaghna Ghana Vati provided better results but percentage relief was observed more in Basti group. So Basti can prove better treatment modality for Avaranjanya Madhumeha because the drugs used in it acts against the Kapha, Meda and Kleda and Sneha helpful to normalize Vata.

Clinical Study on the role of Virechana Karma in the management of Madhumeha w.s.r. to Diabetes mellitus - Tikoo A. *et al.* Jamnagar<sup>9</sup>. 42 patients with combined therapy with Virechana and Nishakatakadi Yoga, provided better relief in Madhumeha in comparison to Shamana Therapy i.e. Nishakatakadi Yoga.

### **RESEARCH WORKS DONE WITH SINGLE HERBAL DRUG ON DIABETES MELLITUS:**

A comprehensive study of Kuberaksha (Caesalpinia bonducella (L) Fleming) w.s.r. to Madhumeha (Diabetes mellitus) – Pankanikar Satish *et al.* Jamnagar<sup>10</sup>, Pharmacological and clinical studies were carried out in this particular work. Pharmacologically, Kuberaksha Ghanavati and the kernel powder of the seed reduced blood sugar at low dose but in the Ghanavati group the blood sugar level was increased but statistically significantly decreased in the kernel powder of the seed at high dose. In clinical study, 26 patients, Group I -kernel powder of the seeds in the capsule form - 9 patients. Group II- Ghanavati- 17 patients. Anupana - Lukewarm water, for 6 weeks were given. Ghanavati was more effective than the kernel powder of the seed on clinical trials.

### **RESEARCH WORKS DONE WITH BASIC AETIOPATHOGENESIS OF DIABETES MELLITUS:**

Concept of Mano Abhigatakar Bhavas on Ama (Free Radicals) Utpatti particular to Madhumeha(DM)-

Mohanty Bishnupriya *et al.* Jamnagar<sup>11</sup>, excessive generation of free radical sustained affection of Manobhitapakara Bhavas altered the body defense mechanism, which in terms can understand that treatment like Manasa Dosahara, counseling, antistress approach, Dipana, Pachana, can check the vicious pathogenesis involved in Madhumeha. There is a direct relation of the mean score of Manobhitapakara Bhavas, Lipid peroxide and fasting blood sugar. Both the role of Vata and Manas has detected as potent initiator of pathogenesis.

#### RESEARCH WORKS DONE WITH BHASMA PREPARATIONS ON DIABETES MELLITUS:

The Role of media in preparation of Vanga Bhasma and evolution for hypoglycemic and anti hyperglycemic effect-Jalpa Jani *et al.* Jamnagar<sup>12</sup>, pharmacology study produces weak to moderate anti-diabetic activity in rats showing high initial blood sugar values and increased blood sugar level in diabetic rats having moderate elevation in blood sugar level. Clinical study done on total 50 patients, 25 in Group A treated with Vastraputi Vanga Bhasma and 22 were in Group B (Vanga Bhasma prepared by Jarana and Marana). Highly Significant improvement in symptoms like Prabhutnutrata, Aavilmutrata, Kshudhadhikya, Trishadhikya and Pindikoudvesthana were observed in both the treated groups. Although, the drugs don't show any hypoglycemic effect on any patients.

A pharmaceutical Standardization and toxicity study of Naga Bhasma prepared by two different methods w.s.r.to Madhumeha (Diabetes mellitus) – Tate P. *et al.* Jamnagar<sup>13</sup>, pharmacology study w.s.r. to Hypoglycemic and Antihyperglycemic study revealed that Naga Bhasmas prepared with and without Jarana have no hypoglycemic action but possess moderate antihyperglycemic action. On Anti-diabetic study: Naga Bhasma showed good anti-diabetic action. Clinical trials on test drug - Naga Bhasma with placebo control, Maize starch in a dosage form of capsule of dose: ½ Ratti (60 mg) (1 capsule) twice days for 28 days were given. Total 56 patients were registered. The scholar concluded that significant relief in all signs and symptoms were observed. Significant decrease in blood glucose level (fasting and 2 hr) was found in both drug treated groups. Unpaired 't' test applied, Naga Bhasma prepared by both methods are equally effective.

The effect of Puta in the preparation of Vanga Bhasma w.s.r.to Madhumeha (Diabetes mellitus) –Darshan Parmar *et.al.* Jamnagar<sup>14</sup>, pharmacology study showed VB1 has weak anti-hyperglycemic effect in streptozotacin diabetic rats and VB2 moderate effect. Thus VB2 showed better activity profile. In addition to producing antihyperglycemic effect it also protects liver and kidney against Diabetes

induced fatty changes. The adjuvant GGH has weak to moderate anti-hyperglycemic effect which tapers off during the course of administration. Further it has the tendency to produce hypertriglyceridemia and its attendant fatty changes in liver and kidney. It does not seem to add to the therapeutic activity of the main drugs. Thus whatever therapeutic activity present in the VB depends upon the Puta, Gaja Puta prepared VB is better. Clinical study of both Vanga Bhasma sample, along with Sahapana (Guduchi Ghana + old honey) following by double blind study on Madhumeha (Diabetes mellitus), The Sahapana also carried out as a control group. 250 mg from each sample of Bhasma along with 250 mg Sahapana was given in capsule form to open it on palm & mixer made by adding previously given honey. This mixer was given to licking twice before 45 min of meal. Total 92 patients 27, 25 & 23 were completed the treatment in Group A, B & C respectively. Diagnostic criteria were followed from WHO & National Diabetes data group. After completion of study, decoding shows that the group A contains Vanga Bhasma by Ardthagaja Puta & Group B contains Vanga Bhasma by Gaja Puta. Unpaired 't' test used, reveals the better effect of Group A [Vanga Bhasma by Ardthagaja Puta] in comparison to Group B [Vanga Bhasma by Gaja Puta].

#### RESEARCH WORKS DONE WITH KUPIPAKWA RASA PREPARATIONS ON DIABETES MELLITUS:

A Pharmaceutico-Pharmaco-Clinical study of Makaradhwaja prepared by Swarna Patra-Varkha and Bhasma w.s.r. to Madhumeha (Diabetes mellitus) - Khedekar Sanjay *et al.* Jamnagar<sup>15</sup>. Pharmacological Study: MKV has the better potential in the treatment of hyperglycemia observed in diabetic condition. Makaradhwaja prepared by Swarna Varkha has the best activity profile. Among the three preparations studied. MKB: Makaradhwaja prepared by Swarna Bhasma closely follows it, while MKP: Makaradhwaja prepared by Swarna Patra has only weak effect which requires longer onset and tapers off quickly. MKP- has weak antihyperglycemic effect in STZ diabetic rats and MKB- moderate consistent effect and MKV moderate to good effect. The test drugs protect kidney against Diabetes induced fatty changes. The adjuvant GGH per se has weak to moderate anti-hyperglycemic effect which tapers off during the course of administration. Further it has the tendency to produce hypertriglyceridemia and its attendant fatty changes in liver and kidney. Guduchi Ghana control group does not seem to add to the therapeutic activity of the main drugs.

In the clinical study, total 126 patients were enrolled and treated for four weeks with Makaradhwaja prepared from three different types of Swarna with

Sahapana. Significant relief in all signs and symptoms was found in both drug treated groups. Significant decrease in blood glucose level (fasting and 2 hr) was found in treated groups. Unpaired 't' test used, Makaradhwaja prepared by Swarna Varkha and Swarna Bhasma are more effective than prepared by Swarna Patra while Makaradhwaja prepared by Swarna Varkha is slightly more effective than the prepared by Swarna Bhasma. All the three groups of Makaradhwaja shows highly significant decrease in subjective as well as objective parameters compared to Guduchi Ghana control group.

#### RESEARCH WORKS DONE WITH VATI PREPARATIONS ON DIABETES MELLITUS:

Further Clinical Studies in the management of Madhumeha with Medoghna Rasayana Vati - Dyauti Dave *et al.* Jamnagar<sup>16</sup>. 35 patients, two groups, Medoghna Rasayana Vati Group A-1gm twice day-60days with lukewarm water. Medoghna Rasayana Vati with modern antidiabetic medicine Group B-same schedule as in Group A. Avaranjanya Madhumeha can be correlated with Diabetes mellitus type II, mainly vitiates Kapha, Pitta and Meda causes obstruction to the path of Vata. Both groups provided better relief in signs and symptoms of the disease.

#### RESEARCH WORKS DONE WITH AASANAS, KAPALBHATI AND PRANAYAMA ON DIABETES MELLITUS:

Aasana is said that by practicing Pranayama regularly anyone can be Sarvarogokshayo. Before Pranayama come Aasana which is praised as, Aasana brings mental as well physical steadiness, health and a feeling of lightness<sup>17</sup>. In a study conducted to assess the effect of Yoga Aasanas on nerve conduction in type 2 Diabetes<sup>18</sup>. - 20 Type 2 diabetic subjects, 30-60 years, 40 days of Yoga Aasanas on the nerve conduction velocity. Yoga Aasanas have a beneficial effect on glycaemic control and improve nerve function in mild to moderate Type 2 Diabetes with sub-clinical neuropathy.

Kapalbhati i.e. rapid performance of Rechaka (exhalation) and Puraka (inhalation) like (emptying and filling up of) the bellows of a blacksmith, well known as the destroyer of disorders caused by phlegm<sup>19</sup>. - In a study conducted to assess the effect of two selected yogic breathing techniques on heart rate variability, in 12 male volunteers (age range, 21 to 33 years) it was noted that Kapalbhati modifies the autonomic status by increasing sympathetic activity with reduced vagal activity. The study also suggests that HRV is a more useful psycho physiological measure than heart rate alone was assessed before and after each practice on separate days<sup>20</sup>.

Ujjayi is appreciated as - Practicing Ujjayi Kumbhaka accomplishes no disorder of phlegm, flatulence or indigestion<sup>21</sup>. Ujjayi removes throat diseases caused by Kapha and increases the gastric fire<sup>22</sup>. - A study conducted to assess the effect of Oxygen consumption during pranayamic type of very slow-rate breathing : Yogic Ujjayi pranayamic type of breathing, ten males ,Age- 28-59 years, The results revealed that the short Kumbhaka pranayamic breathing caused a statistically significant increase (52%) in the oxygen consumption (and metabolic rate) compared to the pre-pranayamic base-line period of breathing<sup>23</sup>.

#### DISCUSSION:

As India has the largest Diabetes population in the world with an estimated 41 million people, amounting to 6% of the adult population it is really a matter of concern to all alternative medicinal experts. Ayurved can contribute a real mine stone treatment with the combination of Pathyakara Aahara Vihara, Regular practice of specific Yogasanas and Pranayamas initially with the Shudhikriyas, regular purification of body with advantageous Panchakarma procedures and with the use of minimum dose of disease specific Rasaushadhis.

As the etiology of disease is chronic hence Shodhana Purvaka Shaman Chikitsa is better than Shamana Chikitsa as only Shamana Chikitsa is not able to correct long lived vitiation of doshas and break old Samprapti. Avaranjanya Madhumeha can be correlated with Diabetes mellitus type-II. So researches prove Basti a better treatment modality for Avaranjanya Madhumeha because the drugs used in it acts against the Kapha, Meda and Kleda and Sneha helpful to normalize Vata which is the main controlling factor of entire body. For Virechana as specific treatment for the disease Madhumeha acts better with Shamana Aushadhi like Nishakatakadi Yoga proves combined successes of both Shodhana and Shamana Chikitsa in Type II Diabetes.

Kuberaksha (Caesalpinia bonducella(L)Fleming) Ghanavati was more effective than the kernel powder of the seed as more active contains can be extracted in Ghana Kalpana than simple Churna of specific herbal drug. Nearly 56 Drugs have been advised for treating 20 types of Prameha. Amongst them, around 14 drugs are prescribed for Madhumeha generally. According to recent researches, Amalaki, Haridra, Gudmara, Tejapatra, Karavellaka, etc. alone or in combination with Rasa Bhasmas can prove beneficial in lifelong control of Madhumeha.

There is a different concept of excessive generation of free radical which in turn leads to sustained affection of Manobhitapakara Bhavasa altering the body defense mechanism, helping in understanding that treatment like

Manasa Dosahara, counseling, antistress approach, Dipana, Pachana, can check the vicious pathogenesis involved in Madhumeha. Both the role of Vata and Manas has detected as potent initiator of pathogenesis.

Rasaushadhis used in minimal amount specific to disease like Naga Bhasma, Vanga Bhasma & Makaradhwaja proved effective in managing type II Diabetes with their well known augmenting property. For Vanga Bhasma scholar claims that whatever therapeutic activity present in the Vanga Bhasma depends upon the Puta, Gaja Puta prepared VB is better. Hence it can be concluded that the amount of heat and time of preparation of Rasaushadhis are directly proportional to their therapeutic effectiveness, more the amount of heat given and more the time taken to prepare the drug higher is the therapeutic efficacy.

As researches showed Kapalbhathi modifies the autonomic status by increasing sympathetic activity with reduced vagal activity i.e. it helps reducing excessive Kapha and make body work in less energy which intern reduces Meda also.

Ujjayi pranayamic type revealed that the short Kumbhaka pranayamic breathing caused a statistically significant increase (52%) in the oxygen consumption (and metabolic rate) compared to the pre-pranayamic base-line period of breathing which increases the metabolic rate increasing the hormonal secretions which helps in maintaining homeostasis in body.

In nutshell Pathyakara Aahara Vihara, Regular Yogasanas and Pranayamas with following proper treatment regime comprising of Panchakarmic and Shatakarmic purificatory procedures with internal herbal and herbo-mineral medications helps predominantly in preventing and managing dreadful disease Diabetes mellitus.

#### Conclusion:

Ayurvedic treatment regime can prove to be boon to the wide population suffering Diabetes mellitus comprising of Pathyakara Aahara-Vihara followed with regular practice of Yogasanas and specific Pranayamic procedures with very vital role of Panchakarmic and Shatakarmic procedures being followed at specific period of year and internal medication as single herbal drugs as well as herbo mineral drugs with Stress reducing practices. Hence further big patient number researches in this field are required as this is only the beginning in this direction.

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