



ANTIDIABETIC DRUGS IN AYURVEDA

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Article Received on: 12/03/13 Revised on: 01/04/13 Approved for publication: 21/05/13

DOI: 10.7897/2230-8407.04605

IRJP is an official publication of Moksha Publishing House. Website: www.mokshaph.com

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ABSTRACT

Ayurveda the Indian traditional Medical science uses many drugs for diseases derived from medicinal plants, Minerals, herbo mineral. Diabetes (Madhumeha) is an important human ailment afflicting many from various walks of life in different countries. This review focuses on Ayurvedic drugs like plants, minerals in single or compound form in various research institutes and articles. A list of Ayurvedic drugs having antidiabetic and related beneficial in treatment of diabetes is compiled. These include, Trivanga Bhasma, Triphala Churna, *Terminalia chebula*, Nimbapatra, Ashvattha, *Acacia arabica*, *Mangifera indica*, *Eugenia jambolana*, *Allium cepa*, *Allium sativum*, *Aloe vera*, *Tinospora cordifolia* etc.

KEYWORDS: Ayurvedic drugs, India, antidiabetic, Madhumeha.

INTRODUCTION

Diabetes is a challenge for every medical faculty. There are many Ayurvedic formulations, herbs, minerals found for the treatment of diabetes (Madhumeha) herbal medicine are gaining popularity both in developing and developed countries because of their natural origin and less side effects. Many traditional medicines in use are derived from medicinal plants, minerals and organic matter Madhumeha¹ is Ayurvedic term for Diabetes mellitus. Increased Kapha dosha and adipose tissue Medo dhatu are the important factors which causes D.M. according to Ayurveda. According to Modern medicine obesity leads to D.M. and obesity is the disease of Medo dhatu (adipose tissue) according to Ayurveda.

Trivanga Bhasma

For this study 36 patients had enrolled, having age more than 30 year. Signs & symptoms of D.M. were noted & blood sugar test was done. Fasting & post prandial blood sugar were done before starting the treatment, in the middle of treatment & after the treatment. The drug was given for three months duration & follow up was taken every after 15 days. The dose of Trivanga Bhasma was 1tds with lukewarm water (Each tablet of 125 mg).²

Triphala Churna (Powder)

A comparative study of Honey (Madhu) and lukewarm water (Ushnodak) as Anupana (Vehicle) with powder of Triphala choorna in Diabetes Mellitus. For this study research design was single blind randomized comparative 60 patients of diabetes were selected and divided into two groups. Group A – 30 patients treated with Triphala powder with honey. Group B – 30 patients treated with Triphala powder with lukewarm water. Dose of Triphala powder was decided as 5 gm twice a day divided doses & duration of treatment was 90 days. Drug was well tolerated by all patients. Drug does not pose any side effect or problem of toxicity. Triphala powder along with honey should more beneficial result in Diabetic patients.³

Terminalia chebula (Haritaki Churna)

In this double blind clinical study 100 patients of diabetes mellitus were selected randomly. Which were randomly divided into four groups. Powder of *Terminalia chebula* in the dose of 10 gm twice per day was administered in Group 1, 2 with Jala and in Group 2 with honey. Effect of *Terminalia chebula* powder vehicle with as a water and honey in both fasting and post prandial state in urine and blood sugar is satisfactory. The drug with water has useful role in the therapy as far as urine and BSL, fasting and post prandial are concerned it is also cost effective.⁴

Nimbapatra (*Azadirachta indica*) Svarasa

In this research work tried to study effect of Nim leaves juice on Diabetes. He had prepared nimb patra svarasa ghanavati. 500 mg thrice a day was administered. Clinical study was carried out on 60 patients. Patients having BSL more than 280 & having complications like hypertension, heart disease, fever etc were excluded. Patients having kapha prakruti was benefited by drug. Patients having dhaturkshaya Madhumeha was not beneficial by the drug. Patients having symptoms like Pipasa, Madhura, Shukla mootrata, Tandra, Hastapadataladaha, Snigdha-picchila-gurugatrata, Talu-jivhadantamalotpatti were cured by the drug.⁵

Nishakatakadi Churna

Nishakatakadi churna was given in the dose of 3 gms thrice daily before meals with lukewarm water for 30 days in both the groups. Diet restrictions according to pathya-apathya were advised. nishkatakadi churna provided better results.⁶

Medoghna Rasayana Vati

The patients having classical signs & symptoms of Diabetes mellitus type 2 have been selected randomly. Diagnostic criteria was increase in Blood sugar level either fasting or post prandial or both & Glucose tolerance Test. Patients of sahaja Madhumeha (IDDM) age below 20 yrs & above 60 yrs having severe diabetic complications cardiac problems, Diabetes mellitus due to other hormonal disturbances like pheochromomocytoma, acromegaly Thyrotoxicoses etc, Diabetes due to side effect of drugs like thiazide groups, steroids were excluded. Routine hematological, biochemical,

urine examinations were carried out, selected patients were categorized randomly in the following two groups. Group A – Medoghna Rasayana vati 11 patients of Diabetes mellitus were included in this group & given medoghna Rasayana vati in the dose of 1 gm twice/day with lukewarm water before meals for 60 days. Group B – Medoghna Rasayana vati with modern anti diabetic medicine, 15 patients were registered in this group treated with medoghna rasayana vati in the dose of 1 gm twice/day with lukewarm water before meals for 60 days along with modern medicine. Medohara rasayana vati was prepared as per reference from Su. chi 9/6. Ingredients are Bhallantaka, Tuvataka, Khadira, Agar, Vijayasara, Guggulu, Shilajitu, Makshika & Ayaskriti. All the patients were allowed to take their routine diet but advised not to take extra carbohydrates and fatty diets. After treatment patients were assessed as per improvement in signs & symptoms Fasting blood sugar & post prandial blood sugar levels, Sr. Cholesterol, Urine sugar. The patients were examined weekly.⁷

Medoghna rasayana vati group and medoghna rasayana vati with modern antidiabetic drugs both provided better relief in signs & symptoms of the disease. Relief in post prandial blood sugar was found significantly in with modern medicine group. Thus it can be said the medoghna rasayana vati can be a good complementary medicine to achieve better control in blood sugar levels.

Kuberaksha (*Caesalpinia bonducella* (L) Fleming)

In experimental study, the test drug was evaluated for its hypoglycemic, Antidiabetic & hyperglycemic activity in the normal rats, alloxan induced diabetic rats & normal mice respectively. In clinical study kuberaksha leaf ghanvati & Kuberaksha kernel seed powder capsule were given to Madhumeha patients in the dose 3 gm into three divided doses with lukewarm water for 6 weeks.

In experimental study, both groups were reduced blood sugar at low dose. In higher dose ghanvati group showed increases in BSL where as Kernel seed powder group significantly decreased BSL. The test drugs did not affect blood sugar level in the normal rats. In clinical study 26 patients were completed treatment in which 7.69% patients were moderately improved & 61.55 % patients were not improved. Leaf Ghanvati was more effective than kernel seed powder capsule. Both the groups were not effective at the dose of 3gm/day.⁸

Meha-Mudgaravati

46 patients of type II Diabetes mellitus were treated with mehamudgarvati (250 mg each) TDS for 3 months. Meha mudgar vati is hypolipidaemic, hypocholesterol, and hepatoprotective as it contains Loha, guguulu, triphala, trikatu, pippalmula, trivritta, bilve etc.⁹

Ashvattha (*Phycus religiosa*)

44 patients were randomly divided in four groups. Patients of erectile dysfunction not having diabetes mellitus were divided in i) Group AG ii) Group PG Group AG was given Ashvattha powder (Root, Stem bark, fruit, leaf buds) in 10 gm dose twice a day with one glass milk before meals. Group PG was placebo, given 500 mg starch capsule twice a day with milk before meals.¹⁰

Patients with diabetes mellitus were divided in i) AGDM was treated like AG group with Ashvattha 10 gm BD with milk & group PGDM with 500 mg starch one BD with milk. Duration was 45 days.

Sexual desire was assessed and scored. Erection, rigidity, ejaculation, orgasm, performance, anxiety, post act exhaustion, frequency of coitus, feeling after sex were examined and scored from 0 to 3 questioners was prepared. Haemogram, Fasting blood sugar, Post prandial blood sugar, Lipid profile, Blood urea level, Sr. Creatinine, routine microscopic urine Biomarkers, Sr. Testosterone, Sr. DHEA-S & Semen analysis was carried out. Erectile dysfunction is more common in diabetes mellitus & more difficult to cure than in non diabetes mellitus. Ashvattha (*phycus religiosa*) showed highly significant increased in total sperm count and total motility in non diabetic patients. Ashvattha is an additional new shukra vrudhdhikar vrushya (aphrodisiac) drug can be used in oligo-asthnozoospermia

***Acacia arabica* (Babul)**

It is found all over India mainly in the wild habitat. The plant extract acts as an antidiabetic agent by acting as secretagogue to release insulin. It induces hypoglycemia in control rats but not in alloxanized animals. Powdered seeds of *Acacia arabica* when administered (2,3 and 4 g/kg body weight) to normal rabbits induced hypoglycemic effect by initiating release of insulin from pancreatic beta cells.¹¹

***Mangifera indica* (Mango)**

The leaves of this plant are used as an antidiabetic agent in Nigerian folk medicine, although when aqueous extract given orally did not alter blood glucose level in either normoglycemic or streptozotocin induced diabetic rats. However, antidiabetic activity was seen when the extract and glucose were administered simultaneously and also when the extract was given to the rats 60 min before the glucose. The results indicate that aqueous extract of *Mangifera indica* possess hypoglycemic activity. This may be due to an intestinal reduction of the absorption of glucose.¹²

***Eugenia jambolana* (Indian Gooseberry, Jamun)**

The extract of jamun pulp showed the hypoglycemic activity in streptozotocin induced diabetic mice within 30 min of administration while the seed of the same fruit required 24 h. The oral administration of the extract resulted in increase in serum insulin levels in diabetic rats. Insulin secretion was found to be stimulated on incubation of plant extract with isolated islets of Langerhans from normal as well as diabetic animals. These extracts also inhibited insulinase activity from liver and kidney.¹³

***Allium cepa* (Onion)**

Various ether soluble fractions as well as insoluble fractions of dried onion powder show anti-hyperglycemic activity in diabetic rabbits. *Allium cepa* is also known to have antioxidant and hypolipidaemic activity. Administration of a sulfur containing amino acid from *Allium cepa*, S-methyl cysteine sulphoxide (SMCS) (200 mg/kg for 45 days) to alloxan induced diabetic rats significantly controlled blood glucose as well as lipids in serum and tissues and normalized the activities of liver hexokinase, glucose 6-phosphatase and HMG Co A reductase.¹⁴

***Allium sativum* (Garlic)**

This is a perennial herb cultivated throughout India. Allicin, a sulfur-containing compound is responsible for its pungent odour and it has been shown to have significant hypoglycemic activity. This effect is thought to be due to

increased hepatic metabolism, increased insulin release from pancreatic beta cells and/or insulin sparing effect.¹⁵

Aloe vera and Aloe barbadensis

Treatment of chronic but not single dose of exudates of *Aloe barbadensis* leaves showed hypoglycemic effect in alloxanized diabetic rats. Single as well as chronic doses of bitter principle of the same plant also showed hypoglycemic effect in diabetic rats. This action of *Aloe vera* and its bitter

principle is through stimulation of synthesis and/or release of insulin from pancreatic beta cells.¹⁶

Tinospora cordifolia (Guduchi)

Oral administration of an aqueous *T. cordifolia* root extract to alloxan diabetic rats caused a significant reduction in blood glucose and brain lipids. Though the aqueous extract at a dose of 400 mg/kg could elicit significant anti-hyperglycemic effect in different animal models, its effect was equivalent to only one unit/kg of insulin.¹⁷

Table: Ayurvedic Plans used for Madhumeha (Diabetes Mellitus) in text and Traditionally¹⁸

Sanskrit/local name	Latin Name	Family	Part Used
Apamarga	<i>Achyranthes aspera</i>	Amaranthaceae	Entire Plant
Agaru	<i>Aquilaria agallocha</i>	Thymelaeaceae	Stem
Argvatha	<i>Cassia fistula</i>	fabaceae	Flower
Ashvatha	<i>Ficus religiosa</i>	Moraceae	Stem Bark, Root Bark, Aerial Root
Babbula	<i>Acacia arabica</i>	fabaceae	Leaves
Bilva	<i>Aegle marmelos</i>	Rutaceae	Leaves, Root Bark
Bhunimba	<i>Andrographis paniculata</i>	Acanthaceae	Entire plant
Dhanyaka	<i>Coriandrum sativum</i>	Apiaceae	Entire plant
Gunja	<i>Abrus precatorius</i>	fabaceae	leaves
Gambhari	<i>Gmelina arborea</i>	Verbenaceae	Stem ,Root bark
Indravaruni	<i>Citrullus colocynthis</i>	Cucurbitaceae	Fruit, Root
Jambira	<i>Citrus aurantium</i>	Rutaceae	Pulp
Jiraka	<i>Cuminum cyminum</i>	Apiaceae	Seeds
Khadira	<i>Acacia chundra</i>	fabaceae	Stem
Kajutaka(kaju)	<i>Anacardium occidentale</i>	Anacardiaceae	Leaves
Kanchnar	<i>Bauhinia variegata</i>	caesalpiniaceae	Flowers
Kusmanda	<i>Benincasa hispida</i>	Cucurbitaceae	fruit
Kasmarda	<i>Cassia sopheru</i>	fabaceae	Bark, Seed
Karpas	<i>Gossypium arboretum</i>	Malvaceae	Seeds
Lasuna	<i>Allium sativum</i>	Liliaceae	Bulk
Mayurshikha	<i>Adiantum caudatum</i>	PtRIDACEAE	Leaves
Mandukparni	<i>Centella asiatica</i>	Apiaceae	Entire plant
Nimba	<i>Azadirachta indica</i>	Meliaceae	Stem
Palandu	<i>Allium Cepa</i>	Liliaceae	Bulb
Panasa	<i>Atrocarpus heterophyllus</i>	Moraceae	Fresh matured leaves
Patta gobi	<i>Brassica oleraceae</i>	Bursaceae	Leaves
Palasha	<i>Butea monosperma</i>	fabaceae	Flowers
Rasna	<i>Alpinia galanga</i>	Zingiberaceae	Rhizome
Saptaparni	<i>Alstonia scholaris</i>	Apocynaceae	Stem bark
Satapushpa	<i>Anethum graveolens</i>	Apiaceae	Seeds
Sitaphala	<i>Annona squamosa</i>	Annonaceae	Leaves
Udumbara	<i>Ficus racemosa</i>	Moraceae	Stem bark, root bark
Vasa	<i>Adhathoda vasica</i>	Acanthaceae	leaves

CONCLUSION

Ancient Ayurvedic Acharyas have very good knowledge about Diabetes Mellitus i.e. Madhumeha and its treatment. According to types of Madhumeha, age, bala and prakruti the use of these Ayurvedic plant or metals is very important and effective. Most of these plants are used by people as vegetables in day today life.

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Cite this article as:

Ingole Rajesh Kundlikrao. Antidiabetic drugs in Ayurveda. Int. Res. J. Pharm. 2013; 4(6):21-24