



“Comprehensive Review on Ayurvedic Herbal Medicine for Prameha (Diabetes Mellitus)”

¹**Dr. Pravin Masram**, Research officer (Ayu.), Central Ayurveda Research Institute Guwahati

²**Dr. Rahul Dhanraj Ghuse**, Assistant Professor, Department of Kaumarbhritya, All India Institute of Ayurveda, Goa

³**Dr. Mridul Ranjan**, Assistant professor, Department of Panchakarma, Faculty of Ayurveda, IMS Banaras Hindu University, Varanasi

⁴**Dr Pramod Kumar Singh**, Assistant professor, Department of Sharir Kriya, NEIAH. Ministry of AYUSH, Govt of India, Shillong Meghalaya

Corresponding Author: Dr. Pravin Masram,

Research officer (Ayu.),

Central Ayurveda Research Institute Guwahati, Assam

Email: pravinmasram15@gmail.com

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Abstract:

Introduction: Ayurveda medical system is used in many places in the Indian subcontinent. Which is emerging in the field of medicine all over the world. Type 2 diabetes, known as Prameha in Ayurveda, is a chronic disease that has long-term effects on the individuals suffering from the disease as well as the entire health care system. Management of Prameha by Ayurveda includes medicines as well as modifications in diet, exercise and lifestyle.

Aims: To explore in-depth information about antidiabetic potential and bioactive compounds present in Ayurvedic herbs.

Methods: This review was done by compiling the classical Ayurvedic literature, Ayurvedic books, Modern Medicine book, Pharmacology (Dravyaguna) and Rasashastra books, magazines and research journals as well as PUBMED, Ayush Data portal, Web of Sciences, Scopus and Google Scholar.

Results: 10 Ayurvedic drugs are having excellent anti-hyperglycaemic effect, anti-glucose tolerance effect, so this could be value addition in biology of diabetic patients. Analysis of the compiled data shows that, about 10 plants used in treat Prameha (DM). Some of these drugs are reported for various pharmacological activities like antidiabetic, anti-hyperlipidaemic, antioxidant and immunomodulatory etc. Chemical constituent and bioactive substances present in drugs also describe in this article.

Discussion and Conclusions: Prameha (~Diabetes mellitus) is a chronic metabolic disorder which can be controlled by Ayurvedic medicine to reduce the increased sugar level. Ayurvedic drugs are having excellent potential as anti-diabetic. The Ayurvedic drugs are having excellent anti-hyperglycaemic effect, anti-glucose tolerance effect, so this could be value addition in biology of diabetic patients.

All ayurvedic herbs mentioned in this article that have been preclinical or clinically tested are beneficial for diabetic patients. Based on the data collected on Ayurvedic

medicines, it can be concluded that Ayurvedic medicines work on the prevention and management of Prameha (Diabetes). Also, no side effects have been found in Ayurvedic medicines. This may be helpful for planning further scientific studies.

Keywords: Ayurveda, Prameha, Diabetes Mellitus, Ayurvedic Herbal Antidiabetic drug

Introduction:

Ayurveda is a traditional medicinal system of medicine that dates back to 1000 BC and originated in ancient India. Ayurvedic medicine is one of the world's oldest holistic healing systems. The word Ayurveda has been formed by combining two Sanskrit words 'Ayus' and Veda. In which Ayushincomes "life" and Veda incomes "knowledge". Thus, 'science of life' is literally meaning of Ayurveda. In the key texts of Ayurveda like Charak Samhita, Sushruta Samhita, AshtangaHridaya and other Ayurvedic books, it is described that diabetes mellitus is a disease of the urinary system which has 20 types. All the symptoms and treatment of Prameha (Diabetes Mellitus) have been explained in detail. Ayurvedic texts define Prameha (Diabetes Mellitus) as disproportionate urination (equally in prevalence and amount) and squalidity. And in Sushruta Samhita also, Prameha (Diabetes Mellitus) is defined as a disease in which the patient has frequent urination which is said to be astringent, sweet. The nature of the turbidity may vary depending on the body's reaction with the doshas.¹ Plants, metals, minerals, sea creatures and animal-derived ingredients are mainly used to make Ayurvedic medicines. The Government of India regulates Ayurveda related policies and the development of Ayurvedic medicines. Research and world-class education in Ayurveda are conducted by the Ministry of AYUSH, Government of India and various states. Has helped in improving the global acceptance of Ayurveda. Ayurveda has grown in popularity around the world following increased awareness in Western countries about the side effects of Western medicine. The World Health Organization is beginning to understand the benefits of traditional medicine due to the side effects of Western medicine and is attempting to advance it. The coming forward of global institutions like World Health Organization will help Ayurveda in getting global acceptance.

The aim of Ayurveda is to maintain the health of a healthy person and to free the sick person from the root causes of disease. Physical and mental treatment is done in Ayurvedic medical system. In physical therapy, Sanshodhan (bio-sensing) and Samashaman (palliative) therapy are done. Treatment of all types of mental disorders is also described in Ayurveda. Special importance is given to the use of herbal and herb-mineral preparations as well as regulation of diet and exercise according to the disease. Ayurveda gaining acceptance in developing and developed countries due to their natural origin and low side effects. With increasing attention of people towards medicinal herbs and Ayurveda, there has been rapid progress in this field. India has the world's largest botanical garden and is the largest producer of medicinal herbs. The present review focuses on the preparations of herbal medicines and plants used in the treatment of Prameha (diabetes mellitus), a major chronic disease causing massive financial loss in the world.

Prevalence of Diabetes Mellitus:

The prevalence of diabetes in 2020 was 151 million among 20–79 years. The International Diabetes Federation (IDF) estimates that by 2030, 578 million people (10.2% of the population) will suffer from diabetes. And diabetes will remain at the top of the top ten causes of death.² After China, India has become the country with the second highest number of people suffering from diabetes in the world. It is estimated that 77 million people in India are suffering from diabetes.³ Diabetes remains a complex problem for the entire world. Reducing the side effects of modern anti-diabetes drugs is also a challenge and becoming a financial burden for developing countries like India.

Diabetes Mellitus: Diabetes is placed in the category of group of metabolic diseases. Increase in blood sugar level above the prescribed level is an indicator of diabetes mellitus. Blood sugar increases as a result of defects in insulin production, insulin action, or both. There are two types of diabetes. One is Type I or Insulin Dependent Diabetes Mellitus (IDDM) and the other is Type II or Type Non-Insulin Dependent Diabetes Mellitus (NIDDM). In Type I, insulin deficiency is found and, in the type II, the level of sugar in the blood increases due to variable degree of insulin resistance, impaired insulin secretion and increased glucose production. Diabetic patients undergo long-term treatment to control blood sugar levels. Due to which the dosage of medicines often has to be increased and a time comes when the patient has to switch to insulin. Such patients become cases of insulin-dependent diabetes and can develop serious complications in multiple organ systems. In which mainly kidney and liver are mostly affected. Dialysis is done continuously at regular intervals which may affect the kidney function.

Method: The purpose of this review is to collect various researches and their results on Ayurvedic herbal medicine on Prameha. For which data has been collected from AYUSH Data Portal, Research Journal, PubMed, Web of Sciences, Scopus and Google Scholar etc. Besides, information has been collected from classical Ayurvedic literature, Ayurvedic books, modern medical books, pharmacology (Dravyagun) and Rasashastra books. Based on the information collected, the benefits of Ayurvedic herbal medicine on Prameha were reviewed.

Management of diabetes Mellitus in Contemporary medical science

1. **Oral drugs group:** Sulfonylureas, Biguanides, Thiazolidinediones, Alpha-glucosidase inhibitors, Meglitinide, DPP-4 inhibitors, SGLT2 inhibitors, Bile acid sequestrant and Dopamine agonist
2. **Insulin therapy**

Management of Diabetes in Ayurveda

1. for obese patients- Panchakarma (~Bio-purification) –
2. Diet control, exercise & therapeutic regimen-Pacifactory measures
3. Management of Obesity (*Medoroga*) is also applicable for diabetes (*Prameha*) because primarily fat (*Meda*) and *Kapha* are involved in both the diseases.
4. Ayurvedic drugs as single or polyherbal, herbo-mineral, fermented preparations as *Asava* & *Arishta*, Decoction & disease specific medicated ghee, oil etc. (mentioned in Samhita, Nighantu, Ayurvedic Pharmacopeia)

Herbal Ayurvedic medicine for Prameha (Diabetes Mellitus)

The focus is once again on pharmacology to prevent the long-term effects of modern antidiabetic drugs on diabetic patients. Clinical trials and animal trials are being included in various types of research. So that it can be established that traditional medicinal herbs can prevent long-term side effects in diabetic patients and improve their quality of life. Many conventional drugs which are made from extracts of traditional medicinal herbs have hypoglycemic effect. The hypo-glycemic effect of herbal extracts has been confirmed in human and animal models of type 2 diabetes. The various health Committee expert on diabetes has recommended that traditional medicinal herbs be further investigated for safety and free from side effect. There are many herbal remedies suggested for diabetes and diabetic complications in Ayurveda. list of drugs with antidiabetic and related beneficial effects is given in Table 1.

Result and Discussion: DM is chronic metabolic disorder due to insufficient secretion of insulin and it is a non-communicable disease. Its complete cure has not been discovered yet. In its treatment, only medicines that control blood sugar are used. Many anti-diabetic medicines are described in Ayurveda. Anti-diabetic effect of Ayurvedic drugs has been observed through research on medicines which includes clinical and animal trials etc. Ayurvedic medicines can be more valuable for diabetic patients because Ayurvedic

medicines have properties like low side effects, excellent anti-hyperglycaemic effects and anti-glucose tolerance effects etc. Analysis of the compiled data shows that, about 11 plants used in treat *Prameha* (DM). Some of these drugs are reported for various pharmacological activities like antidiabetic, anti-hyperlipidaemic, antioxidant and immunomodulatory etc. Chemical constituent and bioactive substances present in in drugs shown in table 1.

Conclusion: In this article, 10 drugs have been described, all of which have been preclinical or clinical trials on medicinal plants. And it has been found that this medicine can be an effective medicine on *Prameha*. The observed results may be helpful in planning further scientific studies regarding the efficacy of these drugs on the prevention and management of *Prameha* (Diabetes). Ayurvedic herbal drugs have struggle gaining worldwide acceptance due to the lack of scientific and clinical data proving their effectiveness and safety. To gain acceptance, it is enormously significant to develop several animal models, develop clinical research, biotic standardization, pharmacology and toxicology evaluation, toxicity study and safety evaluation.

Conflict of Interest: Nil

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Table: Ayurvedic Drugs

Sr. No	Drugs (Ayurvedic Name)	Botanical Name	Family	Part used	Active Chemical Constituent	properties and Mechanisms Action	References
1.	Amalaki	Emblica officinalis	Euphorbiaceae	Fruit	Tannoid compound	Anti-oxidative and anti-diabetics activity ⁴	5
2.	Kirat Tikta	Swertia chirata	Gentianaceae	Whole plant	xanthone, swerchirin	Stimulates insulin release from islets ⁶	7
3.	Daruharidra	Berberis aristata DC	Berberidaceae	Stem, Root	berberine	B. aristata possess anti-diabetic activity in alloxan induced diabetic rats. ⁸	9
4.	Guduci	Tinospora cordifolia	Menispermaceae	Bark	Alkaloid, tannins, cardiac glycosides, flavonoids, saponins,	Glucose uptake activity in EAT cells. ¹⁰	11
5.	Haridra	Curcuma	Zingiberaceae	Rhizome	Curcumin	Control	13

		Longa L	ceace	mes	d and turmeric	Blood Glucose Level ¹²	
6.	Karavella ka	Momordicac harantia	Cucurbita ceae	Fruit	charantinmo mordicosides . Amino acids. hydroxytrypt amine, polypeptide- p vicine	Hypoglyca emic effect ¹⁴	15
7.	Meshasri ngi/Guda mar	Gymnemasy lvestre	Asclepiad acea	Leaf	Gymnemage nin, gymnemic acids.	antidiabetic ¹⁶	17
8.	Methika	Trigonellafo enum- graecum	Papilionaceae	seed	C-steroidal sapogenin peptide ester, fenugreekine,	As an adjunct for the management of hypercholesterolaemia , and hyperglycaemia in cases of diabetes mellitus ¹⁸	19
9.	Vijaysar	<i>Pterocarpus marsupium</i>	Legumino sae	Stem bark	Tannin;Tannins include the hypoglycaemic principle (-)-epicatechin.	Blood Glucose lowering agent ²⁰	21
10.	Jambu	<i>Syzygiumcumii</i> Linn	Myrtaceae	Seed, leaves	alkaloid, jambosine, and glycoside jambolin or antimellin,	Animal study shows that leaves possess anti-hyperglycemic activity ²²	23

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