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EFFECT OF HERBAL MEDICINAL PLANTS IN DIABETES MELLITUS

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ABSTRACT

Over the last century human lifestyle and food habits have drastically changed which lead to various chronic diseases. Diabetes Mellitus is a metabolic disorder characterized by hyperglycemia due to defect in insulin secretion, insulin action or both. According to WHO statistics diabetes is the sixth leading cause of disease- related death in world. Diabetes mellitus is one such disease which is causing serious problems to human health. Around 200 million people around the world are being diagnosed with diabetes. On long standing it leads to many micro and macrovascular complications. The micro vascular complications of diabetes include nephropathy, retinopathy, and neuropathy. Today it is estimated that about 80% of people in developing countries are still depending on traditional medicines based largely on species of plants and animals. Diabetes is a serious metabolic disorder and plenty of medical plants are used in traditional medicines to treat Diabetes. These plants have no side effects and many existing medicines are derived from the plants. The use of plant medicines is becoming popular due to toxic and side effects of allopathic drugs. This led to sudden increase in number of herbal drug industries. The main purpose of this article is to introduce such effective medicinal plants used for treating diabetes and other mechanisms of plant compounds used to reduce glucose levels and increase insulin secretion. In *Ayurveda* there are many herbal medicinal plants described which are useful in diabetes mellitus. This systematic review is to study diabetes and to summarize the available treatments for this disease, focusing especially on herbal medicine.

Keywords: Diabetes Mellitus, Medicinal Plants, Nephropathy, Retinopathy.

INTRODUCTION

Diabetes Mellitus is a metabolic disorder characterized by hyperglycemia due to defect in insulin secretion, insulin action or both.[1,2] Over the last century human life style and food habits have drastically changed which lead to various chronic diseases. Diabetes Mellitus is one such disease which is causing serious problems to human health. Around 200 million people around the world are being diagnosed with diabetes. According to WHO statistics Diabetes is the sixth leading cause of disease- related death in world. [3,4] On long standing it leads to many micro and macro vascular complications. The micro vascular complications of Diabetes include nephropathy, retinopathy, and neuropathy. [5] Today it is estimated that about 80% of people in developing countries are still depending on traditional medicines based largely on species of plants and animals. [6,7] The use of plant medicines is becoming popular due to toxic and side effects of Allopathic drugs. This leads to sudden increase in number of herbal drug industries. In *Ayurveda* there are many herbal medicinal plants described which are useful in Diabetes Mellitus.

Aim- To study the effect of herbal medicinal plants in diabetes mellitus.

Objectives-

1) To study metabolic disorder Diabetes Mellitus in details.
2) To highlight the effect of herbal medicinal plants in Diabetes Mellitus.

Materials and Methods

Diabetes mellitus occurrences in world

Diabetes mellitus is estimated to increase from 4.0 % in the year 1995 to 5.4 % by the year 2025. The number of people with diabetes mellitus in the world will increase from 135 million in 1995 to 300 million in the year 2025. According to statistics, there will be a 42% increase, from 51 million to 72 million, in the developed countries and 70% increase, from 84 to 228 million, in the developing countries.

Types of Diabetes

3 major types

1. Type-1 DM (Insulin dependent Diabetes Mellitus)
2. Type 2 DM (Non- insulin dependent Diabetes Mellitus)
3. Gestational Diabetes Mellitus

Type 1 DM or Insulin dependent Diabetes Mellitus

In Insulin dependent diabetes mellitus, insulin is completely absent because the pancreas lacks cells pore contains defective cells. This condition occurs in genetically susceptible individuals from an autoimmune response that selectively destroys pancreatic cells. Their life spans are drastically reduced up to one third as a result of degenerative complications like kidney dysfunction, nerve impairment, and cardiovascular complications as well as blindness.

Type 2 DM or Non- Insulin Dependent Diabetes Mellitus

Non- Insulin Dependent Diabetes Mellitus is characterized by reduced insulin secretion in response to glucose levels and Insulin resistance which leads to the inefficient absorption of glucose into the cell for energy. It is present in 90% of diagnosed cases of diabetes and affects 18% of the population above 65 years of age, usually occurs in obese individuals.

Gestational Diabetes Mellitus

Gestational Diabetes mainly develops during the time of pregnancy. It results due to the hormonal changes in pregnancy which can change the body ability to use insulin leading to carbohydrate intolerance.

Table 1: List of plants used for treatment of Diabetes Mellitus

Sr. No	Botanical Name	Common Name	Family	Reference
1	*Benincasa hispida*	White gourd melon	Cucurbitaceae	*Raj nighantu*
2	*Commiphora mukul*	Gum-guggul	Burseraceae	*Bhavprakash*
3	*Azadirachta indica*	Neem	Meliaceae	*Kaidevnighantu*
4	*Piper nigrum*	Black Piper	Piperaceae	*Charaksutrasthan*
5	*Luffa acutangula*	Ridged gourd	Cucurbitaceae	*Sushrutsutrasthan*
6	*Cirullus colocynthis*	Bitter Apple	Cucurbitaceae	*Bhavprakash*
7	*Picrorhiza kurroa*	Picrorhiza	Scrophulariaceae	*Bhavprakash*
8	*Mallatus philipinensis*	Kamala Tree	Euphobiaceae	*Bhavprakash*
9	*Solanum nigrum*	Black night shade	Solanaceae	*Bhavprakash*
10	*Myrica esculenta*	Box myrtle	Myricaceae	*Bhavprakash*
11	*Tribulus terristris*	Land Caltrops	Zygoplyllaceae	*Bhavprakash*
12	*Anogeissus latifolia*	Axle-wood	Combretaceae	*Bhavprakash*
13	*Momordia charantia*	Bitter gourd	Cucurbitaceae	*Kaidevnighantu*
14	*Terminalia chebula*	Chebulicmyrobalan	Combretaceae	*CharakChikitsa*
15	*Tinospora cordifolia*	Gulanch	Menispermiaceae	*Bhavprakash*
16	*Hemisdusmus indicus*	Indian sarsaparilla	Asclepiadaceae	*DhanvantariNighantu*
17	*Rubia cordifolia*	Indian madder	Rubiaceae	*DhanvantariNighantu*
18	*Centella asiatica*	Bramhi	Umbelliferae	*Bhavprakash*
19	*Ricinus communis*	Cator oil	Euphorbiaceae	*Shodhalnighantu*
20	*Cedrus deodara*	Deodar	Pinaceae	*Bhavprakash*
21	*Aconitum ferox*	Monks Hood	Ranunculaceae	*RasRatnaSamuchaya*
22	*Moringa olifera*	Drumstick	Moringaceae	*Sushrutsutrasthan*
23	*Cocos nulifera*	Coconut	Palmae	*Kaidevnighantu*
24	*Curcuma longa*	Turmeric	Zingeberaceae	*Bhavprakash*
25	*Semicarpus anacardium*	Marking Nut	Anacardiaceae	*Raj nighantu*
26	*Terminalia arjuna*	Arjuna	Combretaceae	*Bhavprakash*
27	*Adathoda vasica*	Adusa	Acanthaceae	*Bhavprakash*
28	*Piper longum*	Long Piper	Piperaceae	*Bhavprakash*
29	*Acacia cathechu*	Cutch tree	Leguminoceae	*Bhavprakash*
30	*Pongammia pinnata*	Indian beech	Leguminoceae	*Kaidevnighantu*

Some animal experiments that proved efficacy of herbal medicines in Diabetes Mellitus

Aegle marmelos[8]: Antihyperglycemic activity of aqueous leaf extract in streptozocin induced diabetic rats. Each group of animals were treated for 14 days orally. Aegelin alpha and beta sistosterolmarmelosin, marmesin are the constituents responsible for anti-diabetic activity. The extract given at a dose of 10 mg\kg orally reported effective hypoglycemic activity.

Allium sativum[9]: Antihyperglycemic activity was observed in ethyl acetate, ethanol, and petroleum ether extract of alloxan induced rabbits. The extract given at kg/ orally. Allicin, apigenin, allicin, s-allyl cysteine sulfoxide is responsible for hypoglycemic activity.

Allium cepa[10]: Hypoglycemic activity reported in ether soluble fraction of onion (0.25mg/kg/p.o) in streptozotocin induced rabbits. The bulb part contains s-methyl cysteine sulfoxide, s- allyl cysteine sulfoxide has antidiabetic activity.

Mucuna pruriens[11]: Alcoholic extract of plant (100,200, 400mg/kg/day) is given to alloxanized rats reported significant glucose lowering effect. Hypoglycemic activity of plant extract (200mg/kg) reported on daily oral feeding of extract for 40 days in streptozotocin induced diabetic mice.

Ocimum sactum[12] : Leaf power extract (200mg/kg for 30 days) has plasma glucose lowering activity in streptozocin induced diabetic animals revealing the effect of the extract on three enzymes of carbohydrate metabolism namely glucokinase, hexokinase, and phosphofructokinase. Eugenol, carvacrol, linalool, caryophylline, beta sistosterol has potent hypoglycemic hypolipedemic effects in normal and diabetic rats.

DISCUSSION

Diabetes Mellitus is a metabolic disorder characterized by hyperglycemia due to defect in insulin secretion, insulin action or both. Over the last century human lifestyle and food habits have drastically changed which lead to various chronic diseases. Diabetes Mellitus is one such disease which is causing serious problems to human health. Herbal medicines are the major remedy in traditional system of medicine has been used in medical practices since ages. In *Ayurvedic Samhita* many herbal plants are found which are useful in Diabetes Mellitus. Not only in *samhita* but also some animal experiments are proved that some of the herbal plants are effective in Diabetes Mellitus.

CONCLUSION

Diabetes mellitus is a chronic disease which leads to various complications on long standing. Allopathic medicines are not effective in treating the disease leading to various adverse effects. Hence medicinal plants are the best alternative for the treatment of Diabetis Mellitus. The plant species have proved their efficacy in reducing blood glucose levels.

REFERENCES

1. Kooti W, Moradi M, Akbari SA, Sharafi-Ahvazi N, AsadiSamani M, Ashtary-Larky D. Therapeutic and pharmacological potential of Foeniculum vulgare Mill: A review. J HerbMed Pharmacol. 2015;4:1–9.
2. Afrisham R, Aberomand M, Ghaffari MA, Siahpoosh A, Jamalan M. Inhibitory Effect of Heracleum persicum and Ziziphus jujuba on Activity of Alpha-Amylase. Journal of Botany. 2015;2015:1–8. doi: 10.1155/2015/824683.
3. Mukesh R, Namita P. Medicinal Plants with Antidiabetic Potential-A Review. American-Eurasian J Agric Environ Sci. 2013;13(1):81–94.
4. Kazi S. Use of traditional plants in diabetes mellitus. Int J Pharm. 2014; 4(4):283–9.
5. Mohana L, Sandhya R, Kiran U. A review on diabetes milletus and the herbal plants used for its treatment. Asian Journal of Pharmaceutical & Clinical Research. 2012; 5(4):15–21.
6. Modak M, Dixit P, Londhe J, Ghaskadbi S, Devasagayam TP. Indian herbs and herbal drugs used for the treatment of diabetes. J ClinBiochemNutr 2007; 40: 163-173.
7. Rizvi SI, Mishra N. Traditional Indian medicines used for the management of diabetes mellitus. J Diabetes Res 2013; 2013: 712092.
8. B Sharma, SK Satapathi, P RoyHypoglycemic and hypolipidemic effect of Aegle marmelos (L.) leaf extract on streptozotocin induced diabetic mice - Int J Pharmacol, 2007
9. R. Roman-Ramos J. L. Flores-Saenz F. J. Alarcon-Aguilar Anti-hyperglycemic effect of some edible plants August 1995, Pages 25-32
10. Ravindra Patil Bharati Ahirwar Dheeraj Ahirwar Current status of Indian medicinal plants with antidiabetic potential: a review October 2011, Pages S291-S298
11. M. Murugan, C. Uma Maheshwara Reddy Hypoglycemic and hypolipidemic activity of leaves of Mucuna pruriens in alloxan induced diabetic rats Journal of Pharmaceutical Science and Technology Vol. 1 (2), 2009, 69-73
12. Sethi, J., Sood, S., Seth, S. *et al.* Evaluation of hypoglycemic and antioxidant effect of*Ocimum sanctum*. *Indian J Clin Biochem* 19, 152–155 (2004).

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