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Diabetes Mellitus Herbal Treatment

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ABSTRACT :-

Diabetes mellitus (DM), or simply diabetes, is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger). Conventionally, diabetes has been divided into three types namely: Type 1 DM or insulin-dependent diabetes mellitus (IDDM) in which body fails to produce insulin, and presently requires the person to inject insulin or wear an insulin pump. This is also termed as “juvenile diabetes”. Type 2 DM or non insulin-dependent diabetes mellitus (NIDDM), results from insulin resistance, a condition in which cells fail to use insulin properly, with or without an absolute insulin deficiency. This type was previously referred to as or “adult-onset diabetes”. The third main type is gestational diabetes which occurs when women without a previous history of diabetes develop a high blood glucose level during her pregnancy.

Key words: Diabetes mellitus, hyperinsulinemia, herbal plants, treatment, etc.

INTRODUCTION:-

Hyperglycemia is the primary symptom of diabetes mellitus, a chronic condition that also has several clinical neuropathies and macrovascular diseases of the kidney and eyes as consequences [1]. This review is restricted to a discussion of retinopathy, nephropathy, and neuropathy, even though diabetes is also linked to premature macrovascular disease [2].

A non-infectious endocrine condition called diabetes mellitus is linked to hypoglycemia and is typified by a disruption in the metabolism of carbohydrates. It is associated with the development of several severe conditions, including macrovascular conditions like peripheral vascular disease and coronary heart disease, and microvascular conditions including retinopathy, nephropathy, and nephritis [3]. Diabetes, commonly known as diabetes mellitus, has been linked to muscle loss and “sweet urine”-like symptoms. The pancreas secretes the hormone insulin, which regulates blood glucose levels. The pancreas produces insulin to maintain the blood glucose level as these levels rise. Hyperglycemia is brought on by reduced or absent insulin synthesis in diabetic patients. There are three forms of diabetes mellitus: Type 1, Type 2, and gestational diabetes [4]. Insulin-dependent diabetes mellitus also referred to as type 1 diabetes mellitus, is caused by the complete failure of the β cell in the pancreatic islets of Langerhans [5]. Insulin non-dependent diabetes mellitus also referred to as type 2 diabetes mellitus, is characterized by a transient loss of cell mass caused by a hereditary predisposition. It is primarily seen in obese individuals.

Insulin is a hormone secreted by the pancreas that helps to regulate blood glucose levels. The pancreas produces insulin in response to a rise in these levels, which keeps the blood glucose level stable. Hyperglycemia in diabetic patients is brought on by either insufficient or nonexistent insulin production.

One kind of diabetes that manifests in pregnant women as hyperglycemia is called gestational diabetes. Typically, it manifests in 2-4% of second- or third-trimester pregnancies. Polydipsia, polyuria, polyphagia, weariness, nausea, vomiting, impotence in men, poor wound healing, and blurred vision are all signs of diabetes mellitus.[6]. The pancreatic islets of Langerhans are also involved in these symptoms. Insulin-dependent diabetes mellitus, sometimes referred to as type 2 diabetes mellitus, is characterized by a transient decrease of β cell mass. It is mostly caused by genetic predisposition, primarily affecting obese individuals, and is linked to elevated blood pressure and cholesterol levels. Reducing insulin resistance and boosting insulin secretion are the goals of type 2 diabetes treatment.

HERBAL REMEDY TREATMENT:-

The largest dilemma facing medical professionals is how to treat diabetes mellitus using herbal remedies without suffering any negative side effects. Eight hundred medicinal plants are reportedly used worldwide in ethnobotany to prevent diabetes mellitus. Only 450 medicinal herbs have been shown in studies to have anti-diabetic qualities, of which 109 exhibit a full mode of action. Traditional medicinal plants with their active ingredients and therapeutic qualities were employed in the past by both medical professionals and laypeople to treat a variety of illnesses, including diabetes, cancer, and heart disease. In China and India, traditional herbal remedies have long been utilized to treat diabetes. Numerous literature, like Susruta Samhita and Charka Samhita, are available and explain the phytopharmacological aspects of diabetes and its harmful effects[7]. [Sickness, vomiting, dysentery, alcohol flush, migraine, swelling, malignant anemia, and faintness are some of the side effects of synthetic drugs used to treat diabetes. Herbal drugs are a better choice than synthetic drugs due to lower side effects and adverse effects. Herbal formulations can be obtained without a prescription. These herbal medicines are used to treat life-threatening diseases. These drugs are also used when chemical drugs fail to treat a disease. These are natural and risk-free drugs.

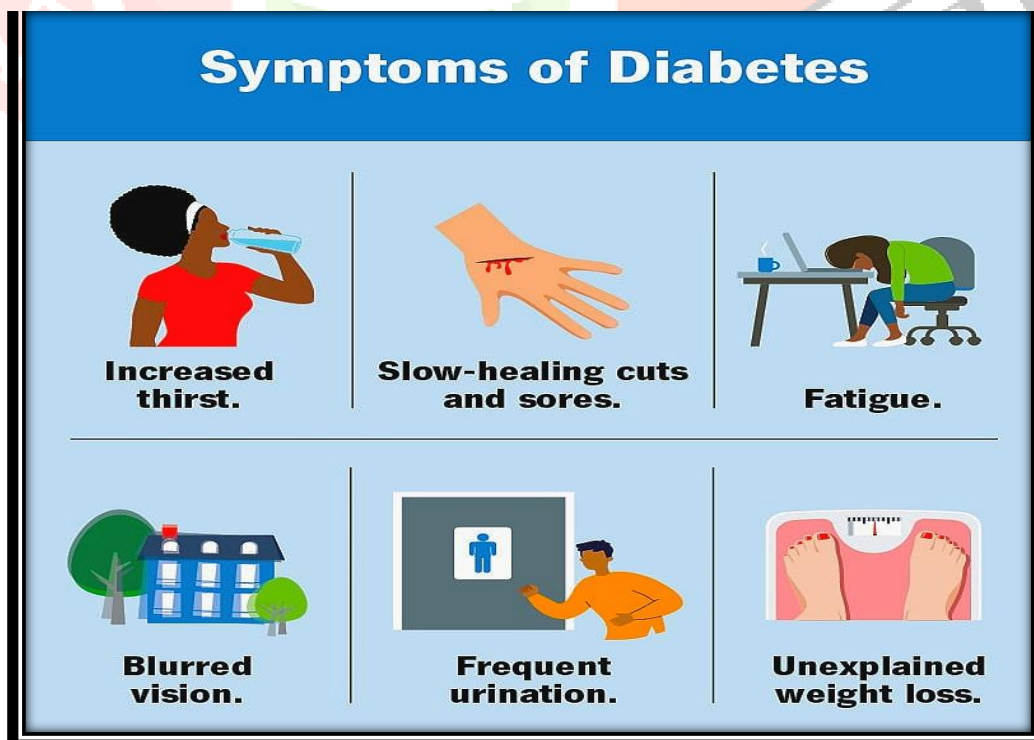


Fig.1 symptoms of diabetes

Herbal medications have become more and more popular as a source of hypoglycemic drugs in recent years. It was estimated by Marles and Farnsworth that over a thousand plant species are utilized in traditional medicine to treat diabetes[8]. The chemical makeup of the plant items utilized as alternative medications to treat diabetes affects how those products function biologically. Plant or herbal items are abundant in components that lower blood glucose levels, such as phenolic chemicals, terpenoids, flavonoids, and coumarins.[9],[10],[11]. Numerous types of herbal remedies have been reported to possess antidiabetic properties in both scientific and popular literature[12].

Herbal medicines are prescribed because of their perceived efficacy, less adverse effects in clinical practice, and affordable price.[13]

Herbal drugs permanently cure people and treat diseases, whereas synthetic drugs only temporarily cure people. Herbal formulations contain natural herbs, fruits, and vegetable extracts that are beneficial in the treatment of a variety of diseases with no negative side effects. Chemical drugs, on the other hand, are synthesized and have side effects. Herbal formulations are less expensive than allopathic medicines. Herbal formulations are environmentally friendly. Herbal formulations are made from natural ingredients, whereas all allopathic medicines are made from chemicals. And natural products that have been chemically modified.[14][15].

Traditional herbal anti-diabetic medications Medicinal plants and herbs are currently being used in extract form for their anti-diabetic activity. Several clinical studies have confirmed that medicinal plant extracts have anti-diabetic activity and can restore pancreatic-cell function.[16].

WHO has identified 21,000 plants used for medicinal purposes around the world. There are 2500 species in India, with 150 of them being used commercially on a large scale. India is the world's largest producer of medicinal herbs and is known as the botanical garden. [17].



Fig.2 Advantages of herbal formulations

1. **Allium sativum** :-Garlic belongs to the Liliaceae family, which includes Allium sativum .[18].Garlic ethanolic extract (10 ml/kg/day) frequently exhibits hypoglycemic activity . Garlic extract outperformed the anti-diabetic drug glibenclamide .[19].In STZ-induced rats, extracts of ethyl acetate, ethanol, and petroleum ether were found to have anti-diabetic activity. Garlic has a variety of therapeutic effects, including antiplatelet, antibacterial, blood pressure, and cholesterol reduction.[20].



Fig.3 Allium sativum

2. **Aloe boradenais**:- It is referred to as Ghikanvar and is a member of the Liliaceae family. With its heavy, narrowing, hairy, green blade-shaped leaves that are filled with clear, viscous gel, it resembles a cactus plant. Blood glucose levels are markedly reduced when aloe vera aqueous extract is taken orally at a dose of 150 mg/kg of body weight . Aloe Vera gel has several medicinal benefits, including anti-diabetic and antioxidant properties. It also causes a four-fold increase in glutathione levels in diabetic rats.



Fig.4. Aloe boradenais

3. **Azadirachta indica** :- It is known as neem in India and is a member of the Meliaceae family. It is sold in India and Myanmar . In large doses, ethanolic and aqueous extracts of *Azadirachta indica* reduce Blood glucose levels. It can be supplemented with allopathic medications in type 2 diabetic patients whose diabetes cannot be controlled solely with allopathic drugs . Natural neem tablets are used to treat a huge number of patients worldwide. Its extract enhances blood circulation by expanding blood vessels and is beneficial in lowering blood glucose levels in the body.[21].



Fig.5 *Azadirachta indica*

4. **Brassica juncea** :-it is known as Rai and is a member of the Cruciferae family. It is commonly used as a spice in a variety of foods. The blood sugar-reducing effect of aqueous seed extract was observed in alloxan-induced diabetic rats. Extract dosages of 250, 350, and 450 mg/kg exhibit hypoglycemic action [22].



Fig.6 *Brassica juncea*

5. **Papaya Carica** It is known as papaya and is a member of the Caricaceae family. In alloxan-induced diabetic mice, seed and leaf extract lowers blood sugar levels, lowers lipid levels, and promotes wound [23].



Fig.7 papaya carica

6. **Catharanthus roseus:-** It is referred to as Vinca roseus and is a member of the Apocynaceae family. In diabetic rats induced with alloxan, methanolic extract of leaves and twigs demonstrates a reduction in blood sugar levels. In animals, oral administration of a 500 mg/kg dosage of extract from leaves and twigs proved effective in decreasing blood sugar levels. Catharanthus roseus works by stimulating the β cells of Langerhans to produce more insulin.



7. **Coriandrum sativum:-** It is often known as coriander and is a member of the Apiaceae family. It is commonly used as a spice in a variety of foods. 200 mg/kg seed extract regularly boosts the action of Langerhans cells and decreases serum sugar in alloxan-induced diabetic rats, as well as insulin generation from pancreatic cells. Coriandrum sativum extract has blood sugar-reducing and insulin-synthesizing properties.



Fig .9 coriandrum sativum

8. **Indica Mangifera** It belongs to the Anacardiaceae family and is commonly known as mango. Although leaves extract (250 mg/kg) has anti-diabetic activity, oral administration of aqueous extract did not affect blood glucose levels in alloxan-induced diabetic rats[24].



Fig.10 mangifera indica

9. **Ocimum sanctum:** It is known as tulsi and is a member of the Labiateae family. It can be found all over India. It is used in Indian Ayurvedic medicine to treat a variety of ailments. Aqueous extract of Ocimum sanctum leaves (200 mg/kg) has shown hypoglycemic action in streptozotocin-induced rats in several animal investigations. It is also used to treat viral infections, fungal infections, stress reduction, tumor treatment, and stomach ulcer treatment[25].



Fig.11 Ocimum sanctum

10). Allium cepa :- It is referred to locally as “onion” or “pyaz” and is a member of the Allium cepa family, Liliaceae. Both the ether soluble and ether insoluble components of dried onion powder demonstrated antihyperglycemic action. Its chemical component, allyl propyl disulphide, or APDS, inhibits the liver’s ability to break down insulin and stimulates the pancreas to produce more insulin, which raises the concentration of insulin and lowers blood glucose levels. In diabetic rats treated with alloxan, essential oil (100 mg/kg) extracted from red onions usually exhibits antioxidant, antihyperglycemic, and antitistatin properties. The most effective percentage for treating hyperglycemia and hyperlipidemia is 300 mg/kg. Numerous clinical studies and investigations on animals have revealed that onions are utilized in the therapy of. Onions are used to treat a variety of illnesses, including cancer, diabetes, asthma, and viral infections, according to data from numerous human trials and animal studies.



Fig.Allium cepa

Diabetes mellitus herbal formulations:- for sale, There are currently several polyherbal formulations in the Indian market that are utilized in various forms for the treatment of diabetes, including Vati, Churna, Arkh, Quath, and so on . These formulations may contain aqueous extracts or powders of various plant parts used to treat diabetes. These formulations are known as poly herbal formulations since they comprise 3 to 25 herbs [26_31].

Herbal Medicine's Difficulties in India:- Although herbs have medicinal value, there are some drawbacks, such as the need for consistency, the fact that a specific amount of medicine is not prescribed to patients, the dose is not strictly given on time, and because the manufacturing method is not standardized, varying amounts of the active ingredient are present. Now the issue is "how to prepare these herbal drugs to overcome the above criticisms to compete with pharmaceutical medicines." It will entail extensive research that will include the separation and categorization of active elements of medicinal plants. Furthermore, herbal medications and even conventional medicine are not currently being used to cure many disorders. There is a need to research alternative medicinal treatments through plant kingdom investigations and the reasoning of their potential through comparative studies [32_33].

Conclusions:

Millions of people worldwide suffer from diabetes mellitus, one of the most prevalent endocrine disorders. This category of metabolic disorders is defined by elevated blood sugar levels brought on by deficiencies in either insulin production, insulin function, or both. Research is shifting towards traditionally available medicines with low side effects and a wide range of bioactivity that do not require laborious pharmaceutical synthesis due to the increase in resistance and populations of patients at risk, as well as the limited number of commercially available drugs for diabetes that still present with many side effects and issues like unwanted hypoglycemic effect, are the reason behind the movement in research towards commonly used medications, which seem very appealing because they have few side effects, a broad spectrum of bioactivity, and don't require time-consuming pharmaceutical manufacturing. Health professionals, scientists, and academics may find this review article helpful in developing evidence-based alternative medicine to treat various forms of diabetes using herbal preparations. Extracts and substances that have been separated from various natural resources are crucial for the development of medications that address the hyperglycemic issue associated with diabetes mellitus.

The use of herbs is not rare to the diabetic patients. Doctors caring for diabetic patients they encourage them to speak regarding the use of herbs as it may effect and the management of their disease.

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Reference:-

- 1) Nathan DM. Long-term complications of diabetes mellitus. N Engl J Med 1993;328:1676-85.
- 2) The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med 1993;329:977-86.
- 3) Colwell JA. DCCT findings: applicability and implications for NIDDM. Di-abetes Rev 1994;2:277-91.
- 4) Committee on Practice Bulletins—Obstetrics: Practice Bulletin No. 137: Gestational diabetes mellitus. Obstet Gynecol, 122(2 Pt1):406–416,2013. Doi:10.1097/01.AOG.0000433006.09219.f1.
- 5) Ross and Wilson. Anatomy and Pathophysiology in Health and Illness, Churchill Livingstone Elsevier, 11th edition, 2010; 227-229.
- 6)Edition;. Edition; <http://www.vision2020uk.org.uk/idf-diabetes-atlas-7thedition>.

- 7) Prabhakar PK, Doble M. Mechanism of action of natural products used in the treatment of diabetes mellitus. *Chin J Integr Med*;2011(17).
- 8) R.J. Marles, N.R. Farnsworth, Antidiabetic plants and their active constituents, *Phytomedicine* 2, (1995) 137–189.
- 9) C.N. He, C.L. Wang, S.X. Guo, Study on chemical constituents in herbs of *Anoectochilus roxburghii* II, *Chin. J. Chin. Materia. Medica* 30, (2005) 761–776.
- 10) M. Jung, M. Park, H-Ch. Lee, Y. Kang, E.S. Kang, S.K. Kim, Antidiabetic agents from medicinal plants, *Curr. Med. Chem.* 13, (2006) 1203–1218.
- 11) HF. Ji, X.J. Li, H.Y. Zhang, Natural products and drug discovery, *EMBO Rep.* 10 (3) (2009) 194–200.
- 12) Valiathan, M.S., Healing plants. *Curr. Sci.* 75, (1998) 1122–1126.
- 13) Verspohl, E.J., Recommended testing in diabetes research. *Planta Med.* 68, (2002) 581–590.
- 14) Kumar K, Fateh V, Verma B, Pandey S. Some herbal drugs used for treatment of diabetes: review article. *International*. vol. 2014;.
- 15) Galor SW, Benzie IF. Herbal medicine : an introduction to its history, usage, regulation, current trends and; Re-research needs. 2011.
- 16) Gupta R, Bajpai KG, Johri S, Saxena M. An overview of Indian novel traditional medicinal plants with antidiabetic potentials. *Complementary and Alternative Medicines*;2008(5):1–17
- 17) Modak, M., Dixit, P., Londhe, J. Devasagayam. Indian herbs and herbal drugs used for the treatment of diabetes. *J Clin Biochem Nutr* 40: 163-73 (2007)
- 18) Malvi R, Jain S, Khatri S, Patel A, Mishra S. A Review on Antidiabetic Medicinal Plants and Marketed Herbal Formulations. *International Journal of Pharmaceutical & Biological Archives*;2011(2):1344–1355.
- 19) Gebreyohannes G, Gebreyohannes M. Medicinal values of garlic: A review. *International Journal of Medicine and Medical Sciences*;2013(5):401–408.
- 20) Lakshmi MS, Rani KSS, Reddy UKT. A review on diabetes mellitus and the herbal plants used for its treatment. *Asian journal of pharmaceutical and clinical research*;2012(5):15–21.
- 21) Mishra R, Shuaib M, Shravan M, S P. A review on herbal antidiabetic drugs. *Journal of Applied Pharmaceutical Science* 2011;1(6):235–237
- 22) Arumugam G, Manjula P, Paari N. A review : Antidiabetic medicinal plants used for diabetes mellitus. *Journal of acute diseases*; 2013
- 23) Giovannini P, Jayne MR, Howes E, E S. Medicinal plants used in the traditional management of diabetes and its sequelae in Central America: a review. *Journal of Ethnopharmacology*;2016(2).
- 24) Dwivedi CP, Dasgaul S. Antidiabetic herbal drugs and polyherbal formulation used for diabetes: A review. *The journal of phytopharmacology*;2013(2):44–51.
- 25) Khan Y, Aziz I, Bihari B, Kumar H, Roy M, Verma VK. A Review- Phytomedicines Used in Treatment of Diabetes. *Asian Journal of Pharmaceutical Research*;2014:4–3
- 26) Jarald E, Joshi SB, Jain DC. Diabetes and herbal medicines. *Iranian Journal of Pharmacology and Therapeutics*;2008(1):97–106.
- 27) Available from: <https://www.ayurtimes.com/bgr-34-for-diabetes>.

28) Rosalie IO, EL E. Antidiabetic potentials of common herbal plants and plant products: A glance. International Journal of Herbal Medicine;2016(4):90–97.

29)Ghorbani A. Best herbs for managing diabetes: A review of clinical studies.Brazillian. journal of pharmaceutical sciences;2013(49).

30)Wais M. Nazish I, Samad A, Beg S, Abusufyan S, Ajaz AS,Mohd Aqil. Herbal Drugs for Diabetic Treatment:An;.

31)Vijayalakshmi N. Anbazhagam M, Arumugam K. Medicinal plants for diabetes used by the people of thirumoorthy hills region of western ghats. International Journal of current microbiology and applied sciences;2014(3):405–410.

32)Nigam V, Nambiar VS. Therapeutic potential of aeglemarmelos correa leaves as an antioxidant and antidiabeticagent : a review. International Journal of Pharma Sciencesand Research2015;6(3);.

33) Elavarasi S. Saravanan K, Renuka C. A systematic reviewon medicinal plants used to treat diabetes mellitus. International journal of pharmaceutical, chemical and biological sciences;2013(3):983–992.

