

A Review - Natural Remedies for Diabetes

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Abstract: *Traditional medicines derived from medicinal plants are used by about 60% of the world's population. This review focuses on herbal drugs and plants used in the treatment of diabetes, especially in India. Diabetes is an important human disease affecting many from various walks of life in different countries. In India it is proving to be a major health problem, especially in the urban areas. Though there are various approaches to reduce the ill effects of diabetes and its secondary complications, herbal formulations are preferred due to lesser side effects and low cost. A list of medicinal plants with proven antidiabetic and related beneficial effects and of herbal drugs used in treatment of diabetes is compiled.*

Keywords: Medicinal plant, Antidiabetic drugs, Herbal drugs, Diabetes

1. Introduction

Herbal medicine, also called botanical medicine or phytomedicine, refers to the use of any plant's seeds, berries, roots, leaves, bark, or flowers for medicinal purposes. Long practiced outside of conventional medicine, herbalism is becoming more mainstream as up - to - date analysis and research show their value in the treatment and prevention of disease. (1)

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs 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. A number of medicinal plants, traditionally used for over 1000 years named rasayana are present in herbal preparations of Indian traditional health care systems. In Indian systems of medicine most practitioners formulate and dispense their own recipes.

For most herbs, the specific ingredient that causes a therapeutic effect is not known. Whole herbs contain many ingredients, and it is likely that they work together to produce the desired medicinal effect. The type of environment (climate, bugs, soil quality) in which a plant grew will affect its components, as will how and when it was harvested and processed

How are herbs used?

For the reasons described in the previous section, herbalists prefer using whole plants rather than extracting single components from them. Whole plant extracts have many components. These components work together to produce therapeutic effects and also to lessen the chances of side effects from any one component. Several herbs are often used together to enhance effectiveness and synergistic actions and to reduce toxicity (2). Herbalists must take many things into account when prescribing herbs. For example, the species and variety of the plant, the plant's habitat, how it was stored and processed, and whether or not there are contaminants (3).

What is herbal medicine good for?

Herbalists treat many conditions such as asthma, eczema, premenstrual syndrome, rheumatoid arthritis, migraine, menopausal symptoms, chronic fatigue, and irritable bowel syndrome, among others. Herbal preparations are best taken under the guidance of a trained professional. Be sure to consult with your doctor or an herbalist before self - treating. Some common herbs and their uses are discussed below. Please see our monographs on individual herbs for detailed descriptions of uses as well as risks, side effects, and potential interactions.

What is the future of herbal medicine?

Although a renaissance is occurring in herbal medicine in the United States, the FDA still classifies herbs as dietary supplements and forbids manufacturers to claim that their products are able to treat or prevent specific diseases. In some countries in Europe, however, herbs are classified as drugs and are regulated. The German Commission E, an expert medical panel, actively researches their safety and effectiveness. (4)

Allopathic drugs used for the treatment of diabetes have their own side effect & adverse effect like hypoglycaemia, nausea, vomiting, hyponatremia, flatulence, diarrhoea or constipation, alcohol flush, headache, weight gain, lactic acidosis, pernicious anaemia, dyspepsia, dizziness, joint pain. So instead of allopathic drugs, herbal drugs are a great choice which is having more or less no side effect & adverse effects (5). Ethno botanical information identified about 800 Indian plants which may have antidiabetic potential (Gupta et al, 1986) All the herbs formulation were procured from local, authentic herbs supplier shops, specialized in sale of medicinal plants & run by the Ayurvedic specialist as OTC Ayurvedic medicines. Though complementary & alternative medicine (CAM) treatments are popular, scientific evidence support their application to diabetes care is scare (Tripathi K. D, 2007). Previous CAM diabetes research has generally focused on single modalities but CAM practitioners more commonly prescribed complex, multi dietary intervention. Ayurvedic interventions may benefits patients with higher base line HbA1c value, warranting further research (6).

Many studies have confirmed the benefits of medicinal plants with hypoglycemic effects in the management of diabetes mellitus. The effects of these plants may delay the

development of diabetic complications and correct the metabolic abnormalities.

The aim of present review is to establish the use of plants, plant parts or extract in curing diabetes mellitus. It also collates available data on plants with hypoglycemic effects. In the present investigation, interest is focused on experimental studies performed on hypoglycemic plants and their bioactive components. A brief description is given about the, type of diabetes, related physiological disorders and available herbal plants which can be further exploited for antidiabetic activity. Overall, this review presents the profiles of plants with hypoglycemic properties, reported in the literature.

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs 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. The World Health Organization (WHO) has listed 21, 000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world. The current review focuses on herbal drug preparations and plants used in the treatment of different chronic diseases in the world. The use of Ayurvedic medicines is common in both adults and children and is increasing in many areas of the world.

Herbal medicine is gaining popularity both in developing and developed countries because of their natural origin. The herbal drugs with antidiabetic activity are yet to be commercially formulated as modern medicines, even though they have been acclaimed for their therapeutic properties in the traditional systems of medicine. The present article gives a brief idea about diabetes mellitus and its treatment by using herbal remedies

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin. Many traditional medicines in use are derived from medicinal plants, minerals and organic matter (7). Number of medicinal plants, traditionally used for over 1000 years named rasayana are present in herbal preparations of Indian traditional health care systems (16). In Indian systems of medicine most practitioners formulate and dispense their own recipes (17). The World Health Organization (WHO) has listed 21, 000 plants, which are used for medicinal purposes around the World. Among these 2, 500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as Botanical garden of the World (17 a).

It is estimated by World Health Organization (WHO) that at least 80% of human population rely on traditional systems of medicine for their primary health needs and these systems are largely medicinal plant based. The rich Indian plant wealth has made a good contribution to the development of

ancient Materia Medica (11). Today traditional societies throughout the World possess a wealth of indigenous knowledge which they have accumulated during prolonged interactions with the nature, which remains fundamental to their physical, spiritual and social well being (2). Ethnobotanists, throughout the World are busy to collect, document and conserve the indigenous medicinal plants. In the last two decades, many reports on medicinal plants used to cure different common as well as severe diseases have been published from the various states of India (1).

Diabetes

Diabetes mellitus may be a disorder of disarranged digestion system, more often than not due to a combination of genetic and natural causes, coming about in strangely tall blood sugar levels (hyperglycemia). Blood glucose levels are controlled by a complex interaction of numerous chemicals and hormones within the body, counting the hormone affront made within the beta cells of the pancreas. Diabetes mellitus alludes to the gather of maladies that lead to tall blood glucose levels due to surrenders in either affront emission or affront activity (11)

Diabetes creates due to a reduced generation of affront (in sort 1) or resistance to its impacts. Both lead to hyperglycaemia, which generally causes the intense signs of diabetes: intemperate pee generation, coming about compensatory thirst and expanded liquid admissions, obscured vision, unexplained weight misfortune, dormancy, and changes in vitality digestion system. Monogenic shapes, e. g. MODY, constitute 1 - 5 % of all cases.

The term diabetes, without capability, usually refers to diabetes mellitus, which is associated with over the top sweet urine (known as "glycosuria") but there are several rarer conditions too named diabetes. The foremost common of these is diabetes insipidus in which the urine isn't sweet (insipidus meaning "without taste" in Latin); it can be caused by either kidney (nephrogenic DI) or pituitary gland (central DI) harm. Most cases of diabetes mellitus drop into one of two wide categories. The term "sort 1 diabetes" has all around supplanted a few previous terms, counting childhood - onset diabetes, adolescent diabetes, and insulin - dependent diabetes (IDDM). Moreover, the term "type 2 diabetes" has supplanted a few previous terms, counting adult - onset diabetes, obesity - related diabetes, and non - insulin - dependent diabetes (NIDDM). Past these two sorts, there's no agreed - upon standard terminology. Different sources have characterized "type 3 diabetes" as, among others, gestational diabetes, insulin - resistant sort 1 diabetes (or "double diabetes"), sort 2 diabetes which has advanced to require infused affront, and inactive immune system diabetes of grown - ups (or LADA or "type 1.5" diabetes.) There's too development onset diabetes of the youthful (MODY) which may be a gather of a few single quality (monogenic) clutters with solid family histories that show as sort 2 diabetes some time recently 30 a long time of age. (12)

Diabetes mellitus may be a systemic metabolic illness characterized by hyperglycemia, hyperlipidemia, hyperaminoacidemia, and hypoinsulinaemia it leads to diminish in insulin, discharge and affront activity.

Currently available treatments for diabetes include insulin and different verbal antidiabetic specialists such as sulfonylureas, biguanides, α - glucosidase inhibitors and glinides. In creating nations items are costly and not easily accessible (13)

Diabetes may be a heterogeneous metabolic clutter characterized by altered carbohydrate, lipid, and protein digestion system which causes hyperglycemia resulting from inadequately affront emission, affront activity or both. (14.) It is one of the refractory infections recognized by Indian Committee of Medical Research for which an alternative pharmaceutical may be a require for the treatment. Diabetes mellitus has gotten to be a growing issue within the modern world. India has nowadays ended up the diabetic capital of the world with over 20 million diabetes and this number is likely to increase to 57 million by 2025. (15)

Allopathic drugs utilized for the treatment of diabetes have their claim side impact & adverse effect like hypoglycaemia, queasiness, spewing, hyponatremia, tooting, loose bowels or constipation, alcohol flush, migraine, weight pick up, lactic acidosis, vindictive frailty, dyspepsia, dizziness, joint torment. So rather than allopathic drugs, home grown drugs are a awesome choice which is having more or less no side impact & unfavorable impacts (16).

Diabetes mellitus could be a clinical disorder characterized by improper hyperglycemia caused by a relative or supreme lack of affront or by a resistance to the activity of affront at the cellular level. It is the most common endocrine clutter, influencing 16 million individuals within the Joined together States and as numerous as 200 million worldwide. Diabetes has been a clinical model for common pharmaceutical. The essential deformity in fuel metabolism comes about in far reaching, multi – organ complications that eventually include virtually every system of the body and each forte of medicine. It has been said that to know diabetes is to know medicine and wellbeing care. In spite of the fact that from a clinical standpoint this may be genuine, our expanding knowledge of the pathophysiology of the disorder, together with the instruments of long - term complications, has placed diabetes inquire about at the wilderness of immunology and molecular science. (17)

Diabetes mellitus could be a bunch of metabolic disorders with one common sign ñ hyperglycemia (18, 19) Incessant hyperglycemia causes damage to eyes, kidneys, nerves, heart and blood vessels (20.). It is caused by acquired and/or acquired deficiency in generation of affront by the pancreas, or by the incapability of the affront delivered. It results either from insufficient discharge of hormone insulin, an lacking reaction of target cells to insulin, or a combination of these components. This disease requires therapeutic determination, treatment and changes in life fashion. It is anticipated to gotten to be one of the world ís fundamental disablers and executioners inside the next 25 a long time.

Diabetes mellitus is characterized by hoisted plasma glucose concentrations resulting from inadequately affront and affront resistance, or both, driving to metabolic variations from the norm in carbohydrates, lipids and proteins [http://care. Diabetes journals. org/content/27/suppl_1/s72. full]. In the event that not cured or controlled it may indeed lead to intense or chronic complications causing ketoacidosis, microangiopathy and other related infections.

Different sorts of detailed diabetes mellitus can be classified beneath taking after two categories:

- Type 1 is insulin - dependent diabetes mellitus (IDDM), in which the body does not deliver any insulin. It most regularly happens in children and youthful grown - ups. Sort 1 diabetes accounts for 5–10% of diabetes.
- Type 2 1 is insulin - dependent diabetes mellitus (IDDM), in which the body does not create any insulin. It most regularly happens in children and youthful grown - ups. Sort 1 diabetes accounts for 5–10% of diabetes.

Diabetes mellitus could be a complex and a diverse group of clutters that irritates the digestion system of carbohydrates, fat and protein. It comes about from deficiency or lack of affront discharge or decreased affectability of the tissue to affront. A few drugs such as biguanides and sulfonylureas are directly accessible to reduce hyperglycemia in diabetes mellitus. These drugs have side impacts and hence looking for a modern lesson of compounds is basic to overcome diabetic issues (22.).

Type 1 diabetes is sometimes called Insulin: Dependent Diabetes Mellitus (IDDM), immune - mediated or juvenile - onset diabetes. It is caused by an auto - immune reaction where the body's defense system attacks the insulin - producing cells. This disease can affect people of any age, but usually occurs in children or young adults. People with this form of diabetes need injections of insulin every day in order to control the levels of glucose in their blood. Type 2 diabetes is sometimes called Non - Insulin Dependent Diabetes Mellitus (NIDDM) or adult - onset diabetes, and accounts for at least 90% of all cases of diabetes. It is characterized by insulin resistance and relative insulin deficiency, either of which may be present at the time that diabetes becomes clinically manifest. The diagnosis of type 2 diabetes usually occurs after the age of 40 but can occur earlier, especially in populations with high diabetes prevalence. It is characterized by insulin resistance and impaired beta cell function. Gestational diabetes (GDM) is a form of diabetes consisting of high blood glucose levels during pregnancy. It develops in one among 25 pregnancies worldwide and is associated with complications in the period immediately before and after birth. GDM usually disappears after pregnancy but women with GDM and their offspring are at an increased risk of developing type 2 diabetes later in life. Approximately half of women with a history of GDM go on to develop type 2 diabetes within five to ten years after delivery.

Herbal Plants Used for Antidiabetics

S. NO	Name	Common Name	Family
1.	<i>Aegle marmelos</i> Corr. ex Roxb.	Wood apple	Rutaceae
2.	<i>Allium Sativum</i>	Garlic (eng), Lasan (Guj), Lasun (Hindi), Lashuna (Sanskrit)	Liliaceae.
3	<i>Andrographis paniculata</i> Nees. l	Kalmegh	Rutaceae
4	<i>Asphaltum punjabianum</i>	Black bitumen or Mineral pitch	
5	<i>Azadirachta Indica</i>	Limdo (Guj), Neem (Hindi)	Meliaceae
6	<i>Caesalpinia bonducella</i> F	Nicker tree	Leguminosae
7	<i>Coccinia indica</i>	Tindora, Scarlet gourd, Ivy gourd	Cucurbitaceae.
8	<i>Curcuma Longa</i>	Ginger	Zingiberaceae
9	<i>Enicostemma littorale</i> Blume	Mamejavo (gujarati), kaviyati (Hindi)	Gentianeae
10	<i>Gymne sylvestre</i> R. Br		Asclepiadaceae
11	<i>Helicterus Isora</i>		Sterculiaceae
12	(<i>Syzygium Cumini</i>)	Jambul	Myrtaceae.
13	<i>Momordica charantia</i>	karvellaka	Cucurbitaceae.
14	<i>Musa Paradisiacal</i>	Banana	Musacea
15	<i>Ocimum sanctum</i> Linn.	Tulsi	labuatae
16	<i>Phyllanthus niruri</i>	Gale of Wind	Euphorbiaceae
17	<i>Polyalthia Longifolia</i> Var. <i>Angustifolia</i>	Ashoka	Annonaceae.
18	<i>Pterocarpus Marsupium</i>	Malabar Kino	Fabaceae
19	<i>Salacia reticulata and Salacia oblonga</i> Wall	saptachakra	Hippocrateaceae.
20	<i>Saraca Indica</i>	Ashok Hindi), Asok (Bengali	Leguminosae
21	<i>Satureja khuzestanica</i>	Satureje	Lamiaceae
22	<i>Scoparia dulcis</i>	Licorice weed	Scrophulariaceae
23	<i>Stevia Rabudiana</i>	Sweetleaf	Asteraceae.
24	<i>Tinospora Cordifolia</i>	Gaduchi	Menispermaceae.
25	<i>Wattakaka volubilis</i>	Perun - kurinjan	Apocynales
26	<i>Abrus preatorius</i> L	Wild liquorice	Fabacea
27	<i>Trigonella foenum graecum</i>	fenugreek	Fabacea
28	<i>Mangifera indica</i>	Mango	Anacardiaceae
29	<i>Tinospora cordifolia</i>	Guduchi	Menispermaceae
30	<i>Allium cepa</i> :	onion	Liliaceae
31	<i>Allium sativum</i>	Garlic	Alliaceae
32	<i>Momordica charantia</i>	Bitter gourd	Cucurbitaceae
33	<i>azadirachta</i>	neem	Meliaceae
34	<i>Dioscoreaopposita</i>	Yam	Dioscoreaceae

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