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Review Article

**NATURAL HERBS VS ALLOPATHIC DRUGS: TO TREAT
DIABETES**

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Abstract:

The present study was based on Diabetes, its cure using natural herbs over allopathic drugs. Diabetes occurs world-wide and the incidences of both type 1 and type 2 diabetes are rising; it is estimated that, in the year 2000, 171 million people had diabetes, and this is expected to double by 2030. Despite the use of advanced Allopathic drugs for the treatment, use of herbal remedies is gaining higher importance because of Allopathic drugs have drawbacks and limitations. Natural herbs have been highly esteemed source of medicine throughout the human history. They are widely used today indicating that herbs are a growing part of modern high-tech medicine. The herbal drugs with anti diabetic activity are extensively formulated commercially because of easy availability, affordability and less side effects as compared to the synthetic anti diabetic drugs. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. A list of medicinal plants with proven anti diabetic and related beneficial effects and of herbal drugs used in treatment of diabetes is compiled. Thus, this review article undertake the attempt for providing updated information on the type of diabetes and herbal formulations which will enhance the existing knowledge of the researchers.

Keywords: *diabetes ; Allopathic drugs; Natural herbs; antidiabetic activity.*

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INTRODUCTION:**How Does Diabetes Affect The Body?**

When someone has diabetes, their body can't maintain healthy levels of glucose in the blood. Glucose is a form of sugar which is the main source of energy for our bodies. Unhealthy levels of glucose in the blood can lead to long term and short term health complications. For our bodies to work properly we need to convert glucose (sugar) from food into energy. A hormone called insulin is essential for the conversion of glucose into energy. In people with diabetes, insulin is no longer produced or not produced in sufficient amounts by the body. When people with diabetes eat glucose, which is in foods such as breads, cereals, fruit and starchy vegetables, legumes, milk, yoghurt and sweets, it can't be converted into energy. Instead of being turned into energy the glucose stays in the blood resulting in high blood glucose levels. After eating, the glucose is carried around your body in your blood. Your blood glucose level is called glycaemia. Blood glucose levels can be monitored and managed through self care and treatment [1,2,3].

Three Things You Need To Know About Diabetes:

❖ It is not one condition- there are three main types of diabetes: type 1, type 2 and gestational diabetes

❖ All types of diabetes are complex and require daily care and management

❖ Diabetes does not discriminate, anyone can develop diabetes [3,4].

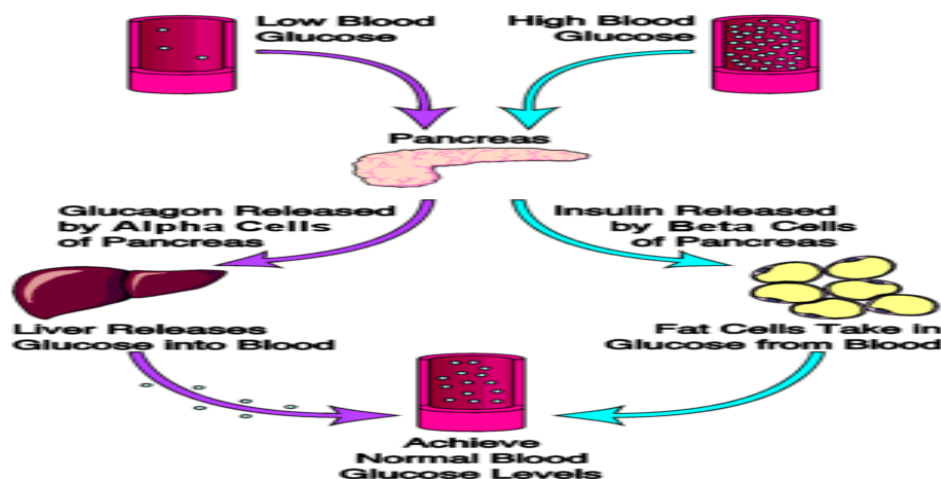
Definition

Diabetes is a chronic disorder in metabolism of carbohydrate, proteins, and fat due to absolute or relative deficiency of insulin secretion with / without varying degree of insulin resistance. Also, it may be defined as a disease where the body produces little insulin / ceases to produce insulin, or becomes progressive resistance to its actions. Diabetes occurs world-wide and the incidences of both type 1 and

type 2 diabetes are rising; it is estimated that, in the year 2000, 171 million people had diabetes, and this is expected to double by 2030 [5].

CLASSIFICATION OF DIABETES MELLITUS

1. β - cell destruction (Type 1 diabetes - IDDM)
 - Immune mediated
 - Idiopathy
2. Insulin resistance (Type 2 diabetes - NIDDM)
3. Genetic defects of β - cell function
 - Glucokinase
 - Hepatocyte nuclear transcription factor – 4 α
 - Insulin promoter factor
 - Mitochondrial DNA
 - Proinsulin or insulin conversion
4. Genetic defects in insulin processing or insulin actions defects in
 - Proinsulin conversion.
 - Insulin gene mutation
 - Insulin receptor mutation
5. Exocrine pancreatic defects
6. Endocrinopathy
 - Acromegaly
 - Cushing syndrome
 - Hyperthyroidism
 - Pheochromocytoma
 - Glucocanorama
7. Infections
 - Cytomegalovirus
 - Coxsacivirus
8. Drugs
 - Glucocorticoid
 - Thyroid hormone
 - Thiazides
 - Phenytoins
9. Genetic syndrome associated with diabetes
 - Down's syndrome
 - Klinefelter's syndrome
 - Turner's syndrome
10. Gestational diabetes mellitus [6,7]

Regulation of Blood Glucose in Normal & Diabetic Patients [5]:

SIGN & SYMPTOMS OF DIABETES MELLITUS [8]

Prediabetes	Type 1 diabetes	Type 2 diabetes
No symptoms	Increased or extreme thirst	Increased thirst
	Increased appetite	Increased appetite
	Increased fatigue	Fatigue
	Increased or frequent urination	Increased urination
	Unusual weight loss	weight loss
	Blurred vision	Blurred vision
	Fruity odour or breath	Sores that do not heal
	In some cases no symptoms	In some cases no symptoms

Diagnosis of Diabetes Mellitus:

The diabetes can easily determined by check glucose level. For healthy man blood glucose levels are 80mg / dL on fasting and up to 160 mg / dL in the postprandial state. In laboratory the diabetes can be diagnosed by

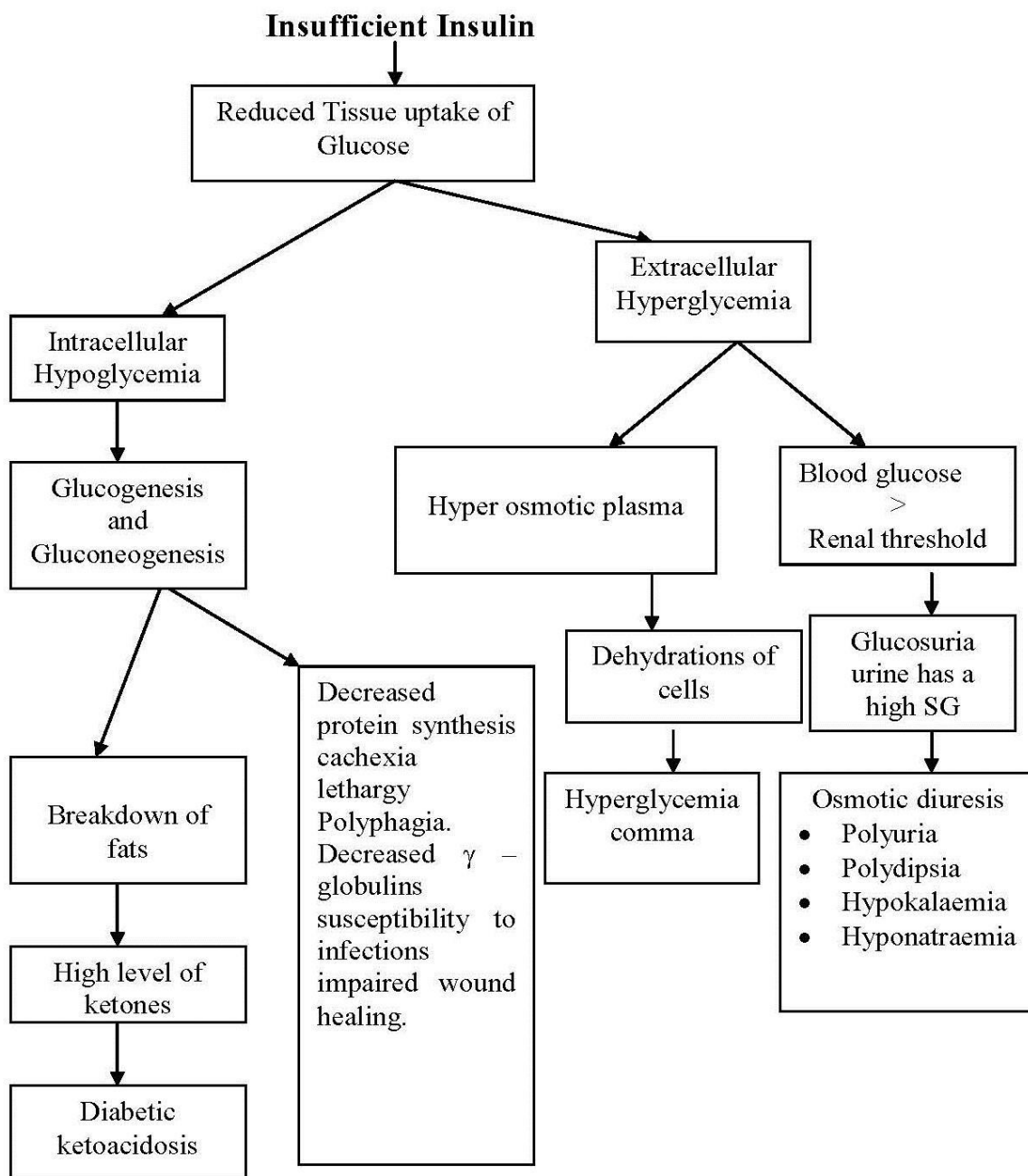
- FINGER STICK BLOOD GLUCOSE.
- FASTING PLASMA GLUCOSE.
- ORAL GLUCOSE TOLERANCE TEST.
- GLYCOSYLATED HEMOGLOBIN OR HEMOGLOBIN A1C [9,10,11].

**American Diabetes Association, 2011
Diagnostic criteria for Diabetes Mellitus**

	Normal Glucose tolerance	Impaired Glucose Tolerance 'PREDIABETES'	Diabetes Mellitus
Fasting plasma glucose	<100mg/dl	100-125mg/dl	$\geq 126\text{mg/dl}$
2 hr plasma glucose during an OGTT**	<140mg/dl	140-199mg/dl	$\geq 200\text{mg/dl}$
Random Blood glucose + Symptoms of diabetes*			$\geq 200\text{mg/dl}$
A1C	<5.6%	5.7-6.4%	$\geq 6.5\%$

*polyuria, polydispsia, weight loss

**after a glucose load of 75g anhydrous glucose dissolved in water

PATHOPHYSIOLOGY OF DIABETES [12]:**ADVANTAGES OF HERBAL DRUGS OVER ALLOPATHIC DRUGS [13,14,15,16]:**

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 (Kokar and Mantha, 1998). 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.

The utilization of natural substances has increased for various diseases amongst general public over last few years not only because of their easy availability without prescription, cost and appointment to the health care professionals but

also owing to the belief that natural substances has less adverse effects as compared to synthetic medicines. Ayurveda is a holistic science that was discovered several years ago. It is preventive as well as curative. On the other hand, Allopathy has been introduced recently; and is widely accepted and practiced across the world. However, Ayurveda is highly popular and mainly followed in India. It is an alternative treatment, which helps to cure certain chronic diseases that cannot be totally cured using allopathic medicines. Ayurveda is primarily a spiritual and traditional way of curing a disease.

The main advantages include

Natural Healing: herbal medicine doesn't obstruct the body's self-healing abilities in any way. On the contrary, they enhance the biological healing machinery so that the recovery process gets accelerated and the body is able to maintain an ideal internal environment that is crucial for such recovery.

Continued Benefits: A lot of herbal remedies come with special instructions about diet, rest, and exercises that enhance the potency of the herb by preparing the body in such a way that it responds to the treatment in the most effective and desirable way. These dietary and lifestyle changes ultimately help the patient by getting their bodies into a healthy rhythm.

Better Immunity: Owing to their tendency of enhancing the body's natural healing process and correcting bad habits that lead to ill-health, herbs contribute towards strengthening the immune system.

Metabolism and Nutrition: A stronger immune system and a holistically regulated diet and lifestyle lead to improved metabolism, which in turn leads to better absorption of nutrition from one's diet.

Side effects: the contraindications are minimal when herbal medication is taken as per prescription and under the supervision of a qualified practitioner.

Some other benefits include

1-Ayurvedic medicines deal with permanently healing the person and effectively treating the disease. Moreover, it also suggests a suitable lifestyle for improving our overall health. On the other hand, the objective of Allopathic treatment is to provide instant relief by destroying the germs, bacteria, virus etc; that caused the sickness.

However, it cannot ensure that the disease will be cured permanently.

2-Ayurvedic medicines are relatively cheaper as they are mostly produced from different types of readily available plants and herbs.

3-Ayurvedic medicines consists of natural herbs and extracts of fruits, vegetables, spices, etc., which helps in curing diseases without any side effects. While, most of the allopathic medicines are synthetically prepared and hence they have some or the other side effect. On the other hand, Ayurvedic medicines are basically natural drugs which are mostly harmless to our body. Allopathy treats the ailments by offering a solution that may produce side effects.

4-Allopathy is a money making profession. While, Ayurvedic treatment is a selfless service for developing a healthy lifestyle.

5-Since Ayurvedic medicines use organic products, they are environment friendly; and hence they help to save the forest and atmosphere from the dangerous chemical pollution.

6-Ayurvedic medicines decontaminate our body, while some Allopathic medicines partially clean our body.

7-Ayurvedic medicines mainly concentrate on the root cause of the problem to cure the specific system of our body; and hence we can maintain good health for a long time. While, Allopathy focuses on the symptoms and not the cause.

8-Ayurvedic medicines are highly effective in curing chronic illness, especially diseases related with our liver; as compared to allopathic treatment. This is due to the fact that, there are some Ayurvedic medicines which include some effective ingredients that can rejuvenate our liver.

9-Although several allopathic medicines are made using natural ingredients, they are artificially manufactured in laboratories and may also include some chemicals. While Ayurvedic medicines are produced from natural ingredients, without any chemicals.

10-Allopathy is a modern system of medical treatment that offers fast but temporary solutions for certain diseases. For example they cannot offer a permanent solution for some serious ailments such as jaundice, piles, arthritis, etc. On the other hand, Ayurveda can successfully cure these diseases. Ayurvedic medicines provide relatively slow but permanent relief, because they focus on the originating cause to cure the affected area and related system of our body.

ALLOPATHIC DRUGS	HERBAL DRUGS
<p>Diabetes Medications: Many different types of medications are available to help lower blood sugar levels in people with type 2 diabetes. Each type works in a different way. It is very common to combine two or more types to get the best effect with fewest side effects.</p> <p>Sulfonylurea: These drugs stimulate the pancreas to make more insulin.</p> <p>Biguanides: These agents decrease the amount of glucose produced by the liver.</p> <p>Alpha-glucosidase inhibitors: These agents slow absorption of the starches and glucose.</p> <p>Thiazolidinediones: These agents increase sensitivity to insulin.</p> <p>Meglitinides: These agents stimulate the pancreas to make more insulin.</p> <p>D-phenylalanine derivatives: These agents stimulate the pancreas to produce more insulin more quickly.</p> <p>Amylin synthetic derivatives: Amylin is a naturally occurring hormone secreted by the pancreas along with insulin. An amylin derivative, such as pramlintide (Symlin), is indicated when blood sugar control is not achieved despite optimal insulin therapy.</p> <p>Incretin mimetics: Exenatide (Byetta) was the first incretin mimetic agent approved in the United States. It is indicated for diabetes mellitus type 2 in addition to metformin or a sulfonylurea when these agents have not attained blood sugar level control alone.</p> <p>Insulins: Synthetic human insulin is now the only type of insulin. It is less likely to cause allergic reactions than animal-derived varieties of insulin used in the past. Different types of insulin are available and categorized according to their times of action onset and duration. Examples of rapid-acting insulins – Regular insulin (Humulin R, Novolin R) <input type="checkbox"/> Insulin lispro (Humalog) <input type="checkbox"/> Insulin aspart (Novolog) <input type="checkbox"/> Insulin glulisine (Apidra) <input type="checkbox"/> Prompt insulin zinc (Semilente, slightly slower acting)</p>	<p>Herbs for diabetes treatment are not new. Since ancient times, plants and plant extracts were used to combat diabetes. Here are some herbs that have been confirmed by scientific investigation, which appear to be most effective, relatively non-toxic and have substantial documentation of efficiency.</p> <p>Cinnamon: Cinnamon is the inner bark and has insulin-like properties, which able to decrease blood glucose levels as well as triglycerides and cholesterol, all of which are important especially for type 2 diabetes patients.</p> <p>Pterocarpus marsupium: It demonstrates to reduce the glucose absorption from the gastrointestinal tract, and improve insulin and pro-insulin levels. It also effective in β cell regeneration.</p> <p>Bitter melon (<i>Momordica charantia</i>): It lower blood glucose concentrations and acts on both the pancreas and in nonpancreatic cells, such as muscle cells.. These include charantin and an insulin-like protein referred to as polypeptide-P, or plant insulin.</p> <p>Gynema Sylvestre: It improves the ability of insulin to lower blood sugar in both type I and type II diabetes. This herb is showing up in more and more over the counter weight loss products and blood sugar balancing formulas.</p> <p>Onion: It consists of an active ingredient called APDS (allyl propyl disulphide) and it block the breakdown of insulin by the liver and possibly to stimulate insulin production by the pancreas, thus increasing the amount of insulin and reducing sugar levels in the blood.</p> <p>Fenugreek (<i>Trigonella foenum-graecum</i>): The fiber-rich fraction of fenugreek seeds can lower blood sugar levels in people with diabetes, and to a lesser extent, for lowering blood cholesterol, weight control.</p> <p>Blueberry (<i>Vaccinium myrtillus</i>): Blueberry is a natural method of controlling or lowering blood sugar levels in the blood. It is a good astringent and helps relieve inflammation of the kidney, bladder and prostate.</p> <p>Asian Ginseng: It has been shown to enhance the release of insulin from the pancreas and to increase the number of insulin receptors. It also has a direct blood sugar-lowering effect and improves psycho-physiological performance.</p> <p>Ginkgo Biloba: The extract may prove useful for prevention and treatment of early-stage diabetic neuropathy. It has also been shown to prevent diabetic retinopathy.</p> <p>Banaba (<i>Lagerstroemia speciosa</i>): Banaba possesses the powerful compound corosolic acid and tannins, including lagerstroemin that lends itself to the treatment of diabetes. These ingredients are thought to stimulate glucose uptake and have insulin-like activity</p>
<p>Examples of intermediate-acting insulins – <input type="checkbox"/> Isophane insulin, neutral protamine</p>	<p style="text-align: right;">Continue....</p> <p>Babhul (<i>Acacia arabica</i>): The plant extract acts as an antidiabetic agent by acting as</p>

<p>Hagedorn (NPH) (Humulin N, Novolin N)</p> <p><input type="checkbox"/> Insulin zinc (Lente)</p> <p>Examples of long-acting insulins –</p> <p><input type="checkbox"/> Extended insulin zinc insulin (Ultralente)</p> <p><input type="checkbox"/> Insulin glargine (Lantus)</p> <p><input type="checkbox"/> Insulin detemir (Levemir)</p>	<p>secretagogue to release insulin.</p> <p>Bengal Quince, Bel or Bilva (<i>Aegle marmelos</i>): Administration of aqueous extract of leaves improves digestion and reduces blood sugar and urea, serum cholesterol. Along with exhibiting hypoglycemic activity, this extract also prevented peak rise in blood sugar at 1h in oral glucose tolerance test.</p> <p>Garlic (<i>Allium sativum</i>): This effect is thought to be due to increased hepatic metabolism, increased insulin release from pancreatic β cells and/or insulin sparing effect, thus decreased fasting blood glucose, and triglyceride levels in serum in comparison to sucrose controls.</p> <p>Aloe (<i>Aloe vera</i> and <i>Aloe barbadensis</i>): <i>Aloe vera</i> and its bitter principle is through stimulation of synthesis and/or release of insulin from pancreatic beta cells.</p> <p>Neem (<i>Azadirachta indica</i>): Hydroalcoholic extracts of this plant showed anti-hyperglycemic activity.</p> <p>Caesalpinia bonducella: The antihyperglycemic action of the seed extracts may be due to the blocking of glucose absorption. The drug has the potential to act as antidiabetic as well as antihyperlipidemic.</p> <p>Indian Goose Berry, Jamun (<i>Eugenia jambolana</i>): Antihyperglycemic effect of aqueous and alcoholic extract as well as lyophilized powder shows reduction in blood glucose level. This varies with different level of diabetes.</p> <p>Mango (<i>Mangifera indica</i>): The aqueous extract of <i>Mangifera indica</i> possesses hypoglycemic activity. This may be due to an intestinal reduction of the absorption of glucose.</p> <p>Holy Basil (<i>Ocimum sanctum</i>): Significant reduction in fasting blood glucose, uronic acid, total amino acid, total cholesterol, triglyceride and total lipid indicated the hypoglycemic and hypolipidemic effects of tulsi in diabetes.</p> <p>Bhuiawala (<i>Phyllanthus amarus</i>): This extract also reduced the blood sugar in alloxanized diabetes.</p>
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CONCLUSION:

The aim of the present study is to give complete information about diabetes and natural herbs available in market for diabetes that are the alternatives to synthetic medicines. Herbal therapy for diabetes has been followed all over the World successfully. Herbs are used to manage Type 1 and Type II diabetes and their complications. For this, therapies developed along the principles of western medicine (allopathic) are often limited in efficacy, carry the risk of adverse effects, and are often too costly, especially for the developing world. The above-mentioned plants have been considered for their possible hypoglycemic actions and the researchers have carried out some preliminary investigations. Herbal medication of diabetes is much better than allopathy.

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