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REVIEW: HERBAL ANTIDIABETIC DRUG

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ABSTRACT

Conventional medicines derived from medicinal plants are utilized by approximately 60% of the arena's populace. This overview focuses on Indian herbal capsules and flora used within the remedy of diabetes, especially in India. Diabetes is an crucial human ailment afflicting many from numerous walks of lifestyles in specific nations. In India it's far proving to be a first-rate fitness trouble, mainly within the city regions. Though there are numerous procedures to lessen the ill results of diabetes and its secondary complications, natural formulations are preferred because of lesser side outcomes and coffee price. A list of medicinal flowers with demonstrated antidiabetic a associated beneficial effects and of natural capsules used in treatment of diabetes is compiled. Diabetes mellitus is the maximumcommon endocrine ailment, affecting sixteen million people in the united states and 2 hundred million international. Regardless of using advanced synthetic pills for the remedy, use of natural remedies is gaining higher significance due to synthetic tablets have drawbacks And limitations. The herbal drugs with antidiabetic hobby are drastically formulated commercially because of easy availability, affordability and much less side effects in comparison to the synthetic antidiabetic pills. Antidiabetic natural formulations (AHF) are considered to be greater powerful for the control of diabetes. There are round six hundred natural drug manufacturers in India of which nearly all producers are developing AHF in addition to others. Till date no article is posted to give precise statistics of the natural arrangements on diabetes available in marketplace. In this we illustrate about diabetes mellitus and its kinds, pathophysiology, diabetic remedy, diabetic treatment, natural diabetic remedy, advantages of natural medicines over allopathy and natural formulations.

INTRODUCTION

The aim of this study is to determine the use of herbs among diabetes and which herbs are use.

Objectives

Herbs use in traditional Indian medicine to treat diabetes seems to lower blood sugar level and insulin level. Herbal formulations are cheap as compared to synthetic medicines and aslo ecofriendly. synthetic drugs are used for the treatment of diabetes are associated with various side effects such as sickness, vomiting, dysentery, alcohol flush, migraine, swelling, malignant anemia and faintness therefore herbal drugs are proved to be better choice over synthetic drugs because of less side effects and adverse effects. Herbal formulations are easily available without prescription. These are natural and safe drugs i. e there is no side effects.

Theory

In the last many times there has been an exponential growth in the field of herbal drug and these medicines are gaining fashionability both in developing and developed countries because of their natural origin and lower side goods. Numerous traditional drugs in use are deduced from medicinal shops, minerals and organic matter. A number of medicinal shops, traditionally used for over 1000 times named rasayana are present in herbal medications of Indian traditional health care systems. In Indian systems of drug utmost interpreters formulate and apportion their own fashions. The World Health Organization (WHO) has listed, 000 shops, 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 patron of medicinal sauces and is called as botanical theater of the world. Treatment of Diabetes mellitus without any adverse goods still the biggest question to medicinal interpreters. In ancient time Croakers and lay person used traditional medicinal shops with their active ingredients and parcels for the treatment of diabetesmellitus. Herbal medicines permanently cure person and treat the complaint while synthetic medicines aren't permanently cured the complaint.

Diabetes mellitus

Diabetes Mellitus is metabolic complaint in endocrine system characterised by habitual hyperglycemia with disturbance in carbohydrate, protein and fat metabolism performing from blights in insulin stashing, insulin action, or both.

Types of diabetes mellitus

1) Type 1 diabetes Mellitus
2) Type 2 diabetes Mellitus
3) Gravid diabetes Mellitus

1) Type 1 diabetes mellitus

Type 1 diabetes Mellitus is also known as insulin dependent diabetes. It's autoimmune complaint caused due to insulin insufficiency because of lack of functional beta cells. Cases suffering from this diabetes are thus completely dependent on exogenous source of insulin.

2) Type 2 diabetes mellitus

Type 2 diabetes Mellitus is also known as insulin independent diabetes are unfit to respond to insulin and can be treated with salutary changes, exercise and drug. Type II diabetes is the more common form of diabetes constituting 90 of the diabetic population.

3) Gravid diabetes mellitus

Gravid diabetes Mellitus occurs in about 5 to 10 of pregnant woman, and generally goes down after the birth of baby. Women who have gravid diabetes have an increased threat of developing type 2 diabetes latterly on.

Diffrence between Healthy and Diabetes individual

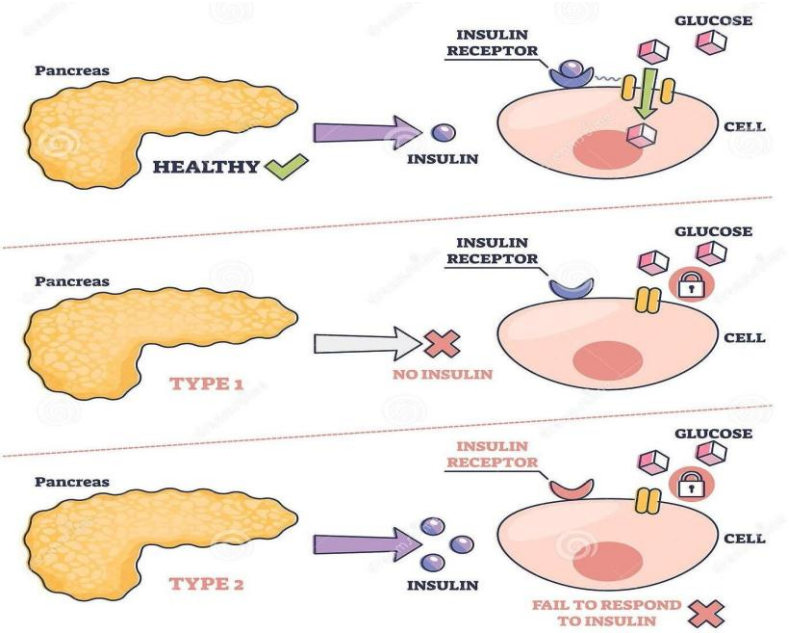

Fig. 1: Diffrence between Healthy and Diabetes individual.

Insulin

Insulin is a protein harmone that's used as drug to treat high blood glucose. This includes in diabetes Mellitus type 1, diabetes Mellitus type 2, gravid diabetes, and complications of diabetes similar as diabetic ketoacidosis. Generally it's given by injection under the skin, but some forms also be used by injection into a muscle. Insulin is a peptide hormone produced by the beta cells of the pancreatic islands, it's considered to be main anabolic hormone of the body. Insulin regulates the metabolism of carbohydrate, fat and protein by promoting the immersion from glucose into liver, fat and cadaverous muscle cells. In these apkins the absorbed glucose is converted into either glycogen or fats or in case of liver or both. Glucose product and stashing by the liver is explosively inhibited by high attention of insulin in the blood. Circulating insulin also effects the conflation of protein in the wide kinds of apkinsit is thus anabolic harmone, promoting the conversion of small motes in the blood into large motes inside the cells.

Managing diabetes with insulin

Injections of insulin can help manage both types of diabetes. The fitted insulin acts as a relief for, or a supplement to, your body's natural insulin. People living with type 1 diabetes can't make insulin, so they must fit insulin to control their bloo glucose situations. numerous people living with type 2 diabetes can manage their blood glucose situations with life changes and oral drug. Still, if these treatments don't help control glucose situations, people living with type 2 diabetes may also need supplemental insulin.

Mechanism of action of insulin

The primary exertion of insulin is the regulation of glucose metabolism. Insulin promotes glucose and amino acid uptake into muscle and adipose apkins, and other apkins except brain and liver. It also has an anabolic part in stimulating glycogen, adipose acid, and protein conflation. Insulin inhibits gluconeogenesis in the liver. Insulin binds to the insulin receptor (IR), a heterotetrameric protein conforming of two extracellar nascence units and two transmembrane beta units. The list of insulin to the nascence subunit of IR stimulates the tyrosine kinase exertion natural to the beta subunit of the receptor. The set receptor is suitable to autophosphorylate and phosphorylate multitudinous intracellular substrates similar as insulin receptor substrates (IRS) proteins, Cbl, APS, Shc and Gab 1. These actuated proteins, in turn, lead to the activation of downstream signaling motes including PI3 kinase and Akt. Akt regulates the exertion of glucose transporter 4 (GLUT4) and protein

kinase C (PKC) which play a critical part in metabolism and catabolism.

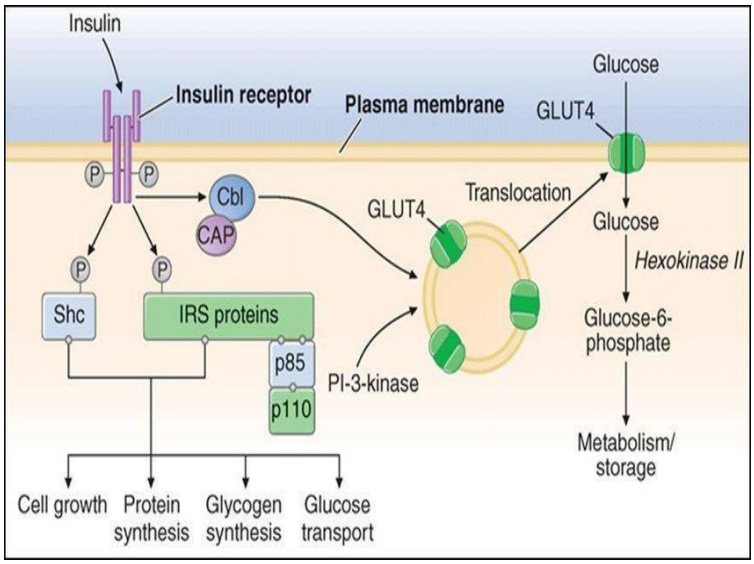

Fig. 2: Mechanism of action of insulin.

Pathophysiology of diabetes mellitus

The main role in pathophysiology of diabetes is oxidative stress. The imbalance between production of reactive oxygen species (ROS) and capacity of enzymatic or non enzymatic antioxidant are known as oxidative stress. Reactive oxygen species contains free radicals such as super oxide, hydroxyl, peroxyl, hydroper- oxyl and non radical species such as hydrogen peroxide.

An- tioxidant contains super oxide dismutase, glutathione reductase, vitamins A, C and E, carotenoid, glutathione and trace elements. Low density lipoprotein cholesterol are oxidized in the presence of reactive oxygen species which taken up by hunter receptor in scavenger celland cause formation of foam cells and arterial sclerosis plaques. These ROS can Stimulate various damaging pathway which have important role in growth of diabetes dis-ease.

Some important pathways are glucosamine pathway, sorbitol aldose reductase pathway, electron transport chain, proteinkinase C stimulation. Stimulation of these pathways and mode of action can lead to atherosclerosis, programmed cell death, lipid per oxidation, advanced glycation end product (Ages) formation, amylin and failure of pancreatic β cell function.

It is proven that sequence specific DNA binding factor (nuclear factor erythroid derived 2 like. 1) along with their negative regulator (Kelch like ECH associated protein. 2) have

important cell protection mode of action against oxidative stress.

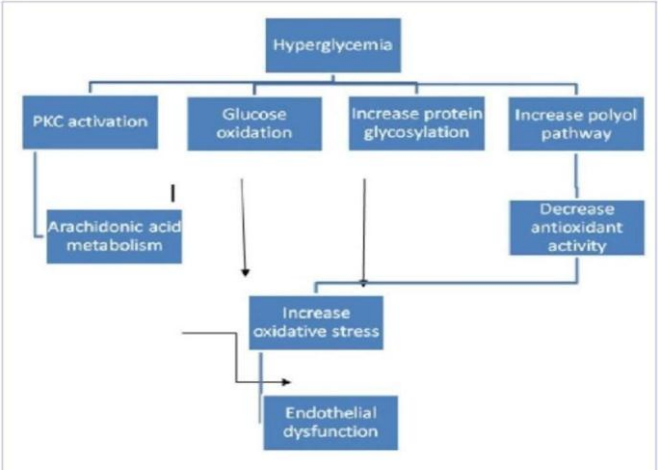

Fig. 3: Pathophysiology of diabetes mellitus.

Herbal antidiabetec drugs

Herbal antibiotic drugs are the use of plant's to control blood sugar level amongst People with diabetes.

There are around 600 herbal drugs manufacturers in India of which almost allmanufacturers are developing antibiotic herbal formulations.

The medicinal plants and herbs are being used in extract forms for their anti diabeticactivity. Various clinical studies confirmed that medicinal plants extract shows anti diabetic activity and restoring the action of pancreatic beta cells.

Herbal formulations are made from the natural products while all opathic medications are produce from the chemical and chemically modified natural products.

These drugs are used when chemical drugs are ineffective in the treatmentof disease.

Fig. 4: Advantages of herbal formulaion.

Examples of herbal antidiabetic drugs (Natural)

(1) Allium sativum

(2) Eugenia jambolana

(3) Momordica charantia

(4) Ocimum sanctum

(5) Phyllanthus embica

(6) Zingiber officinalis

(7) Tinospora cordifolia

(8) Trigonella foenum graecum4.2.

(9) Curcuma longa

(1) Allium sativum

Family: Lilliaceae

Common name: Garlic

Part used: Petroleum ether extract of bulbs

Active constituents: Allyproyl Disulphide oxide, Allicin

Mode of action: Improve plasma lipid metabolism and plasma antioxidant activity.

Fig.5: Allium sativum.

(2) Eugenia jambolana

Family: Myrataceae

Common name: Jamun

Part used: Pulp of fruit

Active constituents: Oleanolic acid, ellagic acid

Mode of action: Inherited insulinase activity from liver and kidney.

Fig. 5: Eugenia jambolana.

(3) Omordica charantiafamily: Curcubitaceae

Common name: Bitter gourd

Part used: Fresh green leaves

Active constituents: Charantin, sterol

Mode of action: Activates PPARS alpha and gama and lower the plasma apo beta-100 in mice fed with high fat diet.

Fig. 6: Momordica charantia.

(4) Ocimum sanctumfamily: Labiateae

Common name: Tulsi

Part used: Entire herb

Active constituents: Eugenol

Mode of action: Increased insulin release.

Fig. 7: Ocimum sanctum.

(5) Phyllanthus embica

Family: Euphorbiaceae

Common name: Amala

Part used: Methanolic extract of leaf

Active constituents: phyllanthin

Mode of action: Reduction of glycemia.

Fig. 8: Phyllanthus embica.

(6) Zingiber officinalis

Family: Zingiberaceae

Common name: Sunth

Part used: Rhizome

Active constituents: Gingerol, shogaol

Mode of action: Increases insulin level.

Fig. 9: Zingiber officinalis.

(7) Tinospora cordifolia

Family: Menispermaceae

Common name: Gulvel

Part used: Aqueous extract of leaves

Active constituents: Tinosporone, tinosporic acid

Mode of action: Decrease of glycemia and brain lipids.

Fig. 10: Tinospora cordifolia.

(8) Trigonella foenum graecum

Family: Fabaceae

Common name: Methi

Part used: Ethanolic extract of leaves

Active constituents: 4- hydroxy isoleucine

Mode of action: Stimulate the secretion of insulin, reduce insulin resistance and decrease blood sugar level.

Fig. 11: Trigonella foenum graecum.

(9) Curcuma longa family: Zingiberaceae

Common name: Turmeric

Part used: Powered form

Active constituents: alpha -plellantrene, tripinolene

Mode of action: Lowers blood sugar, increases glucose metabolism and potentiates insulin activity.

Fig. 12: Curcuma longa.

Examples of herbal antidiabetic drugs (Marketed Formulations)

S. No.	Brand name	Product's company name
1	Kapiva Diabetes	Adret Retail Pvt. Ltd. (Kapiva)
2	Diabic Care	Krishna's Herbal & Ayurveda
3	Diabex Capsules	Herbolab India private limited
4	Everherb Diabetic care juice	Everherb private limited company
5	Glucocare capsule	Himalaya
6	Gymnema Capsule	Himalaya
7	Diabo Yogue	Siddhayu Ayurveda

CONCLUSION

The primary exertion of insulin is the regulation of glucose metabolism. Insulin promotes glucose and amino acid uptake into muscle and adipose apkins, and other apkins except brain and liver. It also has an anabolic part in stimulating glycogen, adipose acid, and protein conflation. Insulin inhibits gluconeogenesis in the liver. Insulin binds to the insulin receptor(IR), a heterotetrameric protein conforming of two extracellar nascence units and two transmembrane beta units. The list of insulin to the nascence subunit of IR stimulates the tyrosine kinase exertion natural to the beta subunit of the receptor. The set receptor is suitable to autophosphorylate and phosphorylate multitudinous intracellular substrates similar as insulin receptor substrates (IRS) proteins, Cbl, APS, Shc and Gab 1. These actuated proteins, in turn, lead to the activation of downstream signaling motes including PI3 kinase and Akt. Akt regulates the exertion of glucose transporter 4 (GLUT4) and protein kinase C (PKC) which play a critical part in metabolism and catabolism

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REFERENCE

1. Report of a WHO Consultation. Definition, diagnosis and classification of diabetes mellitus and its complications. Geneva, World Health Organization, 1999; 1.
2. Aahimi M. A Review: Anti Diabetic medicinal plants used for diabetes mellitus. Bulletin ofenvironmental, pharmacology and life. Sciences, 2015; (4): 163–180.
3. Prabhakar PK, Doble M. Mechanism of action of natural products used in the treatmentofdiabetes mellitus. Chin J integrmed, 2011; (17).
4. www.wekipedia.com 5.https://www.ayush.gov.in
5. Cited from http://www.emedicinehealth.com.
6. Rahelic D. of Idf diabetes Atlas-call for immediate action. Lijec Vjesn, 2016; 7: 138.
7. Australian Institute of Health and Welfare. Cardiovascular disease, diabetes and chronic kidney disease-Australian facts: mortality. Cardiovascular, diabetes and chronic kidney disease, Canberra: AIHW, 2014; 1.
8. Hussain S. Counseling about herbal–drug interactions. J Tradit Complement Altern Med, 2011.