A REVIEW ON BENEFIT OF POLYHERBAL SYRUP IN DIABETES

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ABSTRACT
Diabetes mellitus is a metabolic Disorder characterized by a inadequacy in insulin making or resistance to insulin action It leads to indecorous hyperglycemia. Extend of hyperglycemia can cause severe problem that affect many system of the body and drug taken by the patient polyherbal syrup which contain the potential antidiabetic activity plants and added the honey Honey have also the antidiabetic activity, antihyperlipidemic activity, also the liver protective The polyherbal formulation which give the synerstic activity and also avoid the the severe side effect polyherbal formulation having multiple types of molecules against a disease so different molecules cure a disease by different mechanism so provide a complete therapy against a disease condition.

KEYWORDS: Polyherbal syrup, Diabetes, antidiabetic plants.

INTRODUCTION
Diabetes mellitus has been defined by American Diabetes Association Expert Committee in their 1997 advice as a group of metabolic diseases characterized by increase the glucose level in blood, altered metabolism of lipids, carbohydrates & proteins resulting from fault in insulin secretion, insulin action or both. The chronic hyperglycemia is associated with long damage, dysfunction & failure of v organs especially the eyes, kidneys, nerves, heart & blood
vessels thus covering a wide range of heterogeneous disease contains more number of phytochemical substance like various proteins, calcium, carbohydrate etc.

Classification of Diabetes
(A) **Type 1 diabetes** (β-cell demolition, leading to insulin insufficiency) Immune mediated Idiopathic.

(B) **Type 2 diabetes** (Insulin resistance with relative insulin insufficiency to a predominantly insulin release fault with insulin resistance).

(C) Other specific types
Genetic defects of β-cell role
Chromosome 20q, HNF-4α (MODY1)
Chromosome 7p, glucokinase (MODY2)
Chromosome 12q, HNF-1β (MODY3)
Chromosome 13q, insulin promoter factor (MODY4)
Chromosome 17q, HNF-1β (MODY5)
Chromosome 2q, neurogenic differentiation 1/b-cell e-box transactivator 2 (MODY 6)
Mitochondrial DNA.

D) Genetic defects in insulin action
Type 1 insulin resistance, Leprechaunism, Rabson-Mendenhall syndrome, lipotropic diabetes Cushing’s syndrome etc.

Drug or chemical-induced
Vacor (pyriminil), Pentamidine, Nicotinic acid, Glucocorticoids, Thyroid hormone, Diazoxide, B-Adrenergic agonists, Thiazides, Phenytoin, A-Interferon etc.

A) Uncommon forms of immune-mediated diabetes
“Stiff-man” syndrome, Anti-insulin receptor antibodies Others.

B) Other genetic syndromes sometimes associated with diabetes
C) Gestational diabetes mellitus (GDM)

Pathophysiology

Type 2 diabetic individuals are characterized by:

1. Deficiency in insulin secretion; and
2. Insulin resistance involving muscle, liver, and the adipocyte.

Insulin resistance is present even in lean type 2 diabetic characteristics.

Pathophysiology of Diabetes type 2.

Deficiency Insulin Secretion

The pancreas in people with a functioning β cell is able to modify its secretion of insulin to maintain normal glucose tolerance. When the fasting plasma glucose concentration exceeds 140 mg/dl, the β cell is impotent to continue its raise rate of insulin secretion and the fasting insulin concentration reduces precipitously. This reduction in fasting insulin leads to a rise in hepatic glucose production overnight, which results in an elevated fasting plasma glucose concentration.

SITE OF INSULIN RESISTANCE IN TYPE 2 DIABETES

Liver

In type 2 diabetic subjects with mild to moderate fasting hyperglycemia (140 to 200 mg/dl, 7.8 to 11.1 mmol/L); basal hepatic glucose making is increased by 0.5 mg/kg per minute. Consequently, an additional 35 g of glucose to the systemic circulation during the overnight sleeping hours the liver of an 80-kg diabetic single with modest fasting hyperglycemia occurs. In fasting hyperglycaemia is the cause of rise in fasting hepatic glucose production.
After being glucose is ingested, insulin is secreted into the portal vein and carried to the liver, where it suppresses hepatic glucose output. If the liver is resistant to insulin and stays resistant to produce glucose, there will be two inputs of glucose into the body, one from the liver and another from the gastrointestinal tract, and marked hyperglycemia will ensue.

**Muscle**

Major site of glucose disposal in human body is muscle, in skeletal muscle an 80% of total body glucose uptake occurs to raise the plasma insulin concentration response to a physiologic increase, reaching a plateau value of 10 mg/kg per minute muscle glucose uptake increases linearly. In persistent, the onset of insulin action is delayed for 40 minutes in lean type 2 diabetic patient and the capacity of insulin to stimulate leg glucose uptake is reduced by 50% Therefore the primary site of insulin resistance in type 2 diabetic subjects resides in muscle tissue.

**Table No 1: Clinical manifestations of a complete lack of insulin.**
Polyherbal concept

Drug formulation in Ayurveda is based on two principles: Use as a single drug and use of more than one drugs, in which the latter is known as poly herbal formulation (PHF) This key therapeutic herbal master plan utilize the merging of medicinal herbs to achieve extra therapeutic effectiveness, usually known as poly pharmacy or poly herbalism.

Based on the nature of the interaction, there are two mechanisms on how synergism acts (i.e., pharmacodynamics and pharmacokinetic) In terms of pharmacokinetic synergism, the capacity of herb to facilitate the absorption, distribution, metabolism and elimination of the other herbs Pharmacodynamics synergism on the other hand, studies the synergistic effect when active constituents with similar therapeutic activity are targeted to a homogeneous receptor or physiological system Other than that, it is believed that abundance of factors and difficulty cause diseases in most of the cases, leading to both visible and invisible symptoms Here, mixing of herbals may act on more targets at the same time to provide a thorough relief No disease has just one single symptom Also in the pathogenesis of a disease different factors or at work The common cold causes cough, headache, runny nose, nausea, fatigue Likewise, we need non identical medicines (plants) to resolve the signs and symptoms of a disease The plants in a poly-herbal medicine may: rise the effectively and potency of the formulation, reduce unwanted effects, make the formulation more palatable, and increase its lifespan Due to synergism, poly herbalism confers some benefits not available in single herbal formulation It is evident that superior therapeutic effect can be reached with a single multi-constituent formulation For this, a beneath dose of the herbal preparation would be needed to achieve advantageous pharmacological action, thus reducing the risk of side-effects Besides, PHFs bring to improved convenience for patients by eliminating the need of taking more than one different single herbal formulation at a time, which indirectly leads to better compliance and therapeutic effect All these benefits have resulted in the popularity of PHF in the market when collate to single herbal formulation.

Preparation of Polyherbal Syrup of Diabitic activity

Formulation is a process to access the route for the preparation leads to come out a product named as formulation In the formulation, the concentrations of the ingredients are well defined to prevent the errors and weigh in the quantity as required or specified.
There are various steps involved in the formulation of syrup are as follows.

1 Extraction of crude drug which having potential antidiebitic activity.

List of plants having antidiabetic activity.

1) Aerial parts: - Artemisia pallens, Bidens pilosa, Bixa orellana, Teramnus labialis.

2) Bark: - Cinnamomum zeylanicum, Croton cajucara.

3) Bulb: - Allium cepa, Allium sativum.

4) Flower: - Cassia auriculata, Gentiana olivier, Musa sapientum.

5) Fruit: - Carum carvi, Coriandrum sativum, Embellica officinalis, Juniperus communis, Momordica charantia, Xanthium strumarium.

6) Leaves: - Aloe barbadensis, Annona squamosa, Averrhoa bilimbi, Azadirachta indica, Beta vulgaris, Camellia sinensis, Cassia, alata, Eclipta alba, Eucalyptus globulus, Euphrasia officinale, Ficus carica, Gymnema sylvestre, Gynura procumbens, Ipomoea aquatica, Mangifera indica, Myrtus communis, Memecylon umbellatum, Morus indica, Ocimum sanctum.


8) Roots: - Clausena anisata, Glycerrhiza glabra, Helicteres isora, Pandanus odorus.

9) Seed: - Acacia arabica, Agrimony eupatoria, Lupinus albus, Luffia aegyptiaca, Lepidium sativum, Mucuna pruriens, Punica granatum.

10) Stem: - Amaranthus spinosus, Coscinium fenestratum.

11) Tubers: - Ipomoea batata.


List of plants having insulin mimetic or insulin secreatory activity.


2) Acacia arabica Babool (Leguminosae): - Release of insulin from pancrease.

3) Agrimony eupatoria (Rosaceae): - Leaves Insulin releasing and insulin like activity.

4) Aloe barbadensis Gheeuar (Liliaceae): - Stimulating synthesis and release of insulin.


6) Averrhoa bilimbi Bilimbi (Oxalidaceae): - elevation serum insulin level.

7) Bixa orellana Annota (Bixaceae) Innscurelians er epleastmora: - insulin concentration and elevation insulin binding on target site.
8) *Boerhaavia diffusa* Punamava (Nyctaginaceae): elevation plasma insulin concentration.

9) *Camellia sinensis* Green tea (Theaceae): elevation insulin secretion.

10) *Capsicum frutescens* Mirch (Solanaceae) Irnecerepatoser: elevation secretion and reduction of insulin binding on the insulin.

11) *Cinnamomum zeylanicum* Dalchini (Lauraceae): Elevation in plasma insulin level


13) *Eucalyptus globulus* Eucalyptus (Myrtaceae): elevation insulin secretion from clonal pancreatic beta line (BRIN-BD 11).

14) *Ficus religiosa* Peepal (Moraceae): Initiating release of insulin.

15) *Hibiscus rosa* Gudhal (Malvaceae): Stimulate insulin secretion from beta cells.

16) *Helicteres isora* Itrneedian screw (Sterculiaceae): Decrease plasma triglyceride level and insulin sensitizing activity.

17) *Ipomoea batata* Shakarkand (Convolvulaceae): Reduce insulin resistance and blood glucose level.

18) *Juniperus communis* Hauber (Pinaceae): Increase peripheral glucose consumption and induce insulin secretion.

19) *Olea europia* Olive (Oleaceae): Increase insulin release and increase peripheral uptake of glucose.

20) *Swertia chirayata* Chirayata (Gentianaceae): Stimulates insulin release from islets.

21) *Scoparia dulcis* Mithi patti (Scrophulariaceae): Insulin-secretagogue activity.

22) *Tinospora crispa* Giloe (Menispermaceae): Anti-hyperglycemic, stimulates insulin release from islets.

Many stape involve in the powder form of the crude drug

1) Size reduction

2) Imbibation

3) Maceration

4) Percolation

5) Drying
2 Preparation of buffer solution for the maintain pH.

3 Preparation of syrup base.
A Syrup base is a mixture of ingredients containing inert substances (other than the drugs having therapeutic action) i.e. sweeteners, preservatives, flavors, viscous agents, etc.

Honey:- act as a sweetener and also having antidiabetic activity.
Natural honey (NH) has been used as food and medicine by mankind since ancient times. It has been reported that raw honey is the most ancient sweetener, and has been in use throughout the world since several million years ago. Natural honey (NH) is a sweet liquid food of high nutritional value, and immense health benefits. NH is produced by honey-bees as blossom honey by releasing nectars of flowers, and honeydew honey (forest honey) by secreting the exudates of plant sucking insects (Aphids). The use of honey is even encouraged for all ages and embraced by all religious and cultural beliefs.

The presence of glucose and fructose together in honey have been suggested to provide a complimentary effect on glucose and glycogen in the liver. However, only decrease concentrations of fructose have been found to improve glucose tolerance and hepatic glucose metabolism while highest concentrations have an opposite effect.

Honey minimal incremental effect on blood glucose compared to other sweeteners or common sugars, consumption of honey or its addition to other carbohydrate diets is highly encouraged in diabetic patients. This is very important because it is well known that the majority of diabetic patients do not always adhere to the dietary guidelines such as the exclusion of simple sugars in the diabetic diets. In animal models of diabetes, there is more compelling evidence in support of honey as a novel antidiabetic agent.

4 Preparation of final formulation (Syrup).
Crud drug powder + addition of honey + addition of distil water= SYRUP

Benefit of polyherb Formulation
PHF starts to get its popularity recently worldwide, owing to the fact that PHF possesses advantages which is not available in allopathic drugs.

Firstly, PHFs are known to express top effectiveness in a number of diseases. As a formentioned, the therapeutic effect of herbal medicines are employ due to the presence of
different phyto-constituents and the effects are further potentiated when compatible herbals are formulated together in PHFs.

PHFs are found to have therapeutic range Most of them are effective even at a low dose and safe at high dose, thus they have higher level risk to benefit ratio.

PHFs (confined to manufactured and used) result in some side effects as compared to allopathic drugs Although allopathic drugs are designed for efficacious therapeutic results, administration of most of them come with unwanted side-effects, such as insomnia, vomiting, fatigue, dry mouth, diarrhea, seizures, impotency, confusion, hair loss, organ toxicities and even death! Patients prescribed with non-steroidal anti-inflammatory drugs for rheumatoid arthritis (RA) treatment may experience mainly gastrointestinal and renal side effects, including dyspepsia, gastric ulceration, salt and fluid retention, as well as hypertension Their higher quality affordability and greater accessibility account for increasing demand globally, especially in rural areas and some developing countries, where costly modern treatments are not available Moreover, throughout the history, poly herbal remedies have long stand as beliefs, norms and practices in certain tribes, which are based on centuries’ old experience of trials and errors Put it just, PHF are more readily acceptable culturally and socially All the above reasons: Effectiveness, safety, cheap, ubiquity and better acceptance, made PHF an ideal treatment of choice, hence higher compliance by the patients and excellent therapeutic effect is ensured.

CONCLUSION
Herbal medicine is an essential part of the development of present day process Using the Ayurvedic concept of Panchamahabhutas and Tridoshas, PHFs provide treatment of diseases in a holistic approximate The use of Ayurvedic PHFs has stood the test of time The scientific advancement carries with it the improvement in Ayurvedic formulation of PHFs, through the study of phytoconstituents and discovery of useful herbs combinations which work synergistically to produce desirable effect Allopathic medicine have the more side effect when the polyherbal formulation which having the more phytochemical constituent so give less severe side effect and long time useof herbal formulation e but not produce toxicity Poor Only with correct and rational use, Ayurvedic PHFs can exert the best effect in human health.
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REFERENCES


