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Evaluation of Antidiabetic Potential of Herbal Combination by Allexon Induced Method.

Tanisha Dipak kale, Dhiraj Dilip Chavan, Rucha Ingle, Ravindra Kale

PRMS'S Anuradha College of Pharmacy Chikhali

ABSTRACT:

Diabetes mellitus is caused by decreased insulin secretion. The people throughout the world increasingly affected by diabetes mellitus, a global problem. Due to side effects and other reasons usage of oral hypoglycemic agents is reduced. Globally, there will be an increase in the usage of herbal medicines for treating various diseases was reported. According to WHO all herbal medicines should be scientifically evaluated for their activities. In India from ancient time onwards herbal medicines were used to cure many diseases. Diabetes Mellitus is cured by many medicinal plants. Many formulations were also formulated to treat diabetes mellitus but there is a lack of scientific validation so, the aim of this study is to select and scientifically validate a Traditional polyherbal formulation. This review work is a small step towards scientifically studying the traditional polyherbal antidiabetic formulation, so as to standardize and improve the formulation for the benefit Of humankind.

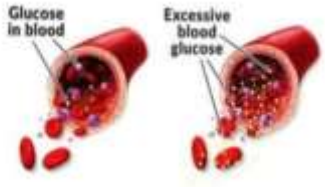
KEYWORDS: Traditional polyherbal formulation, Antidiabetic, review

INTRODUCTION:

Across the globe, diabetes mellitus, whether insulin- or non-insulin-dependent, is a prevalent and dangerous metabolic illness. Worldwide, traditional herbal remedies have been utilised to treat diabetes mellitus. Many herbs have been shown to treat and manage diabetes among various medications and polyherbal plants; furthermore, they have no negative side effects. Diabetes mellitus is a terrible condition that affects people everywhere and is starting to pose a major risk to human health.

1. Polyherbal formulations are those that incorporate more than two herbs. The two guiding concepts of Ayurvedic medication formulation are the use of several drugs and the use of a single drug. It is difficult to explain polyherbalism in terms of contemporary conditions. The concept of polyherbalism to achieve increased medicinal efficacy was emphasised in the Ayurvedic literature Sarangdhar Samhita.

2.It is possible to prove that plants are a source of anti-diabetic medications through reports on ethnobotanical information. There are about 800 plants that could have anti-diabetic properties. Despite being the standard treatment for diabetes and being efficient in lowering blood sugar, synthetic oral hypoglycemic medications and insulin have a higher rate of adverse effects and are unable to significantly alter the course of diabetic complications. This explains why an increasing number of patients are looking for supplementary medications that might have fewer or no adverse effects.



1. Countries In the rising great task is to tackle increased cost Of medicine and their side effects. The scientific Advancement carries with it the improvement in Polyherbal formulations, through the study of various Phytoconstituents and discovery of useful herbs Combinations which work synergistically to produce Desirable effect. Although polyherbal formulation is Commonly used in many parts of the world, but Scientifically it has not been explored.

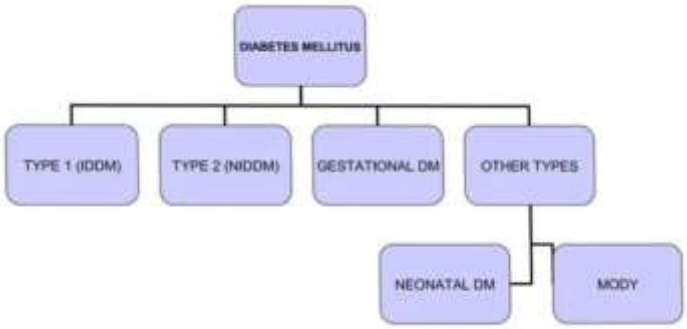
DIABETES MELLITU

Diabetes is a lifelong (chronic) disease and is a group of metabolic disorder characterized by high levels of sugar in blood (hyperglycemia). It is caused due to deficiency of insulin or resistance to insulin or both. Insulin is secreted by B-cells of pancreas to control blood sugar levels. Blurry visions, excess thirst, fatigue, frequent urination, hunger, weight loss are some of the symptoms commonly seen in diabetic patients .

SIGN AND SYMPTOMS OF DIABETES MELLITUS

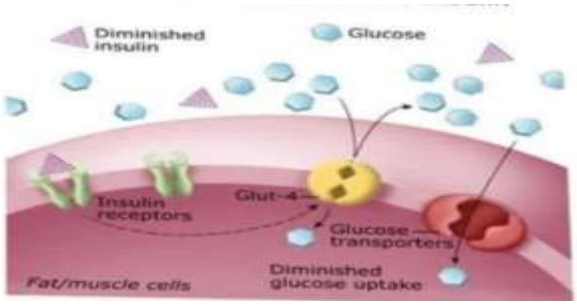
- Increased Thirst
- Frequent Urination
- Unexpected Weight Loss
- Increased FatigueKi
- Blurred Vision
- Numbness And Tingling,Especially In Your Feet And Hands
- Slow Healing Sores
- Red, Swollen, Tender Gums

TYPES OF DIABETES MELLITUS



TYPE 1 DIABETES MELLITUS

(IDDM) T1D, also called as the insulin-dependent diabetes mellitus (IDDM), manifests due to the autoimmune damage of the B-cells which then leads to the suppression or cessation of insulin production. T1D is also called the “juvenile diabetes” People with Diabetes Type 1 are unable to produce insulin. Most patients with Diabetes Type 1 developed the condition before the age of 40. Approximately 15% of all people with diabetes have Type 1.



Risk Factors For Type 1 DM

The presence of damaging immune system cells that make auto antibodies:-Sometimes family members of people with type 1 diabetes are tested for the presence of diabetes auto antibodies. If you have these auto antibodies, you have an increased risk of developing type 1 diabetes. But, not everyone who has these auto antibodies develops type 1.[6]

TYPE 2 DIABETES MELLITUS

Non insulin dependent diabetes mellitus (NIDDM), maturity onset diabetes mellitus There is no loss or moderate reduction in beta cell mass(30-40%); insulin in circulation is low, normal or even high. Over 90% cases are types 2 DM. The majority of people with Type 2 have developed the condition because they are overweight. Type 2 generally appears later on in life, compared to Type 1. Type 2 is the most common form of diabetes. In the case of insulin resistance, the body is producing the insulin, but insulin sensitivity is reduced and it does not do the job as well as it should do. The glucose is not entering the body's cells properly, causing two problems:[7]

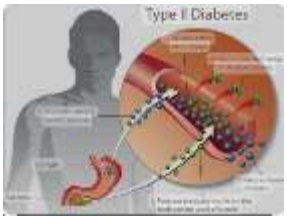
Risk Factor For Types 2 DM

Obesity:- The number one risk factor for type 2 diabetes is obesity. Greater weightMeans a higher risk of insulin resistance because fat interferes with the body's abilityTo use insulin. The number of children being diagnosed with type 2 diabetes has also Risen.[8]

Sedentary lifestyle: A sedentary lifestyle is damaging to health and bears responsibility for the growing obesity problems." Inactivity and being overweight go hand in hand towards a diagnosis of type 2. Muscle cells have more insulin receptors than fat cells, so a person can decrease insulin resistance by exercising. Being more active also lowers blood sugar levels by helping insulin to be more effective.[9]

GESTATIONAL DIABETES MELLITUS

Gestational diabetes only happens during pregnancy. It means you have high blood sugar levels, but those levels were normal before you were pregnant. If you have it, you can still have a healthy baby with help from your doctor and by doing simple things to manage your blood sugar also called blood glucose. After your baby is born, Gestational diabetes usually goes away. Gestational diabetes makes you more likely To develop type 2 diabetes, but it won't definitely happen.[11]



Risk factors for gestational diabetes mellitus Age:-

Women older than age 25 are at increased risk.Family or Personal History:- Your risk increases if you have prediabetes-a precursor to type 2 diabetes-or if a close family member, such as a parent or sibling, has type 2 diabetes. You're also at greater risk if you had gestational diabetes during a previous pregnancy, if you delivered a very large baby or if you had anUnexplained stillbirth. Weight: -Being overweight before pregnancy increases your risk.

Race: For reasons that aren't clear, women who are black, Hispanic, American, Indian or Asian are more likely to develop gestational diabetes.

OTHER TYPES OF DM

Maturity onset diabetes of the young (MODY): MODY is a rare form of diabetes which is different from both Type 1 and Type 2 diabetes, and runs strongly in families. MODY is caused by a mutation (or change) in a single gene. If a parent has this gene mutation, any child they have, has a 50 per cent chance of inheriting it from them If a child does inherit the mutation they will generally go on to develop MODY before they're 25, whatever their weight, lifestyle, ethnic group etc.[13]

Neonatal diabetes:- Neonatal diabetes is a form of diabetes that is diagnosed under the age of nine months. It's a different type of diabetes than the more common Type 1 diabetes as it's not an autoimmune condition (where the body hasDestroyed its insulin producing cells).[14]

Objective:

By considering the side effects of oral Hypoglycemic drugs . The present hypothesis is given

1. To evaluate Hypoglycemic activity of Jamun seed on normal animal.
2. To evaluate Hypoglycemic activity of Bitter gourd powder on normal animal.
3. To evaluate Hypoglycemic activity of Babhul dried fruit on normal animal .

POLYHERBAL DRUGS IMPORTANCE :

Treatment of Diabetes mellitus without any adverse effects is Still the biggest question to medical practioners. According to World ethanobotanical 800 medicinal plants are used for the prevention of diabetes mellitus. Clinically proven that only 450 Medicinal plants possess anti diabetic properties from which 109 Medicinal plants have complete mode of action. In ancient time Doctor and lay person used traditional medicinal plants with their Active constituents and properties for the treatment of various Diseases such as heart diseases, cancer and diabetes. There is A long history of traditional plants used for the control of Diabetes in India and China. There are various books available such As Charaka Samhita and Susruta Samhita which explains phy-Topharmacology features of diabetes and its adverse effect.

Synthetic drugs which are used for treatment of diabetes are as-Sociated with various adverse effect such as sickness, vomiting, Dysentery, alcohol flush, migraine, swelling, malignant anemian And faintness. Herbal drugs are proved to be a better choice over Synthetic drugs because of less side effects and adverse effects. Herbal formulations are easily available without prescription. These herbal drugs are used for life threatening disease.[36]

HERBS INFORMATION

<u>JAMUN</u> (Eugenia jambolana)

Botanical name :- syzygium cumini

Family :- myrtaceae

Biological source:-

It is a large evergreen tree of Indian subcontinent, also known as Syzygium cumini L. commonly known as 'Jamun' in India. The decoction of kernels of Eugenia jambolana is used as a household remedy for diabetes.

Geographical source:-

The black plum, Syzygium cumini (family Myrtaceae), also known as java plum or jamun, is originated from Southeast Asia. It is a fast-growing tree, flourishing in hotter regions, having been introduced to the Pacific and Indian ocean islands and Australia, and considered to be invasive in many countries/regions.

Chemical constituent:-

Jamun mainly contains polyphenols, flavonoids, phenolic, anti-inflammatory, anthocyanins, gallic acids, tannins, phenols, alkaloids, ellagic acid, glycoside, isoquercetin, kaempferol, myricetin, tannins, flavonols, flavone, and vitamins**.**

Advantage

- Its low glycemic index, diabetic patients should consume Jamun during the summer.
- It alleviates diabetic symptoms such as excessive urination or pushing.
- The extracts of the leaves, seeds, and bark are very successful in treating diabetes

Disadvantage

- Blood sugar imbalance- According to Ayurveda, the consumption of Jamun, in general, is very beneficial for people with high blood pressure.

Uses:

- Because of its low glycemic index, diabetic patients should consume Jamun during the summer.
- It alleviates diabetic symptoms such as excessive urination or pushing.
- The extracts of the leaves, seeds, and bark are very successful in treating diabetes.

BITTER GOURD (Momordica charantia)

Botanical name:- Mom**o**rdica charantia

Family : Cucurbitaceae

Biological Source:-

It is obtained from fresh fruit of Momordiaca Charantia Linn. (Family Cucurbitaceae)

Geographical Source:-

It grows in tropical areas of the Amazon, East Africa, Asia, India, South America, and the Caribbean.

Advantage:-

- This study shows the significance of hypoglycemic effects of bitter gourd and Knol khol juices among the type 2 Diabetic patients.
- Hence Bitter gourd juice, Knol khol juices may be beneficial in Diabetes patients to reduce the blood glucose level.

Disadvantage :-

- Diarrhea, vomiting, and other intestinal issues.
- Vaginal bleeding, contractions, and abortion.
- Dangerous lowering of blood sugar if taken with insulin.
- Liver damage.
- Favism (which can cause anemia) in those with G6PD deficiency.
- Problems due to mixing with other drugs to alter effectiveness.

Uses:-

- Bitter melon is one of the most commonly used vegetable that contains polypeptide-p and is used to control diabetes naturally.

- Polypeptide-p or p-insulin is an insulin-like hypoglycemic protein, shown to lower blood glucose levels in gerbils, langurs and humans when injected subcutaneously

BABHUL (Acacia arabica)

Botanical name:- Gum acacia, Gum Arabic, Indian gum, Babul

Family:- Leguminosae

Biological source:-

Indian gum is the dried gummy exudation obtained from the steam and branches of Acacia Arabic wild, belonging to the family Leguminosae.

Geographical source:-

The plant is found in India, Sri Lanka, Sudan, Morocco, Africa. In India, it is occur Punjab, Rajasthan, Maharashtra and Western Ghats.About 85% of world supply of gum acacia is from Sudan.

Chemical constituent:-

Gum acacia consists arabin, which is complex mixture of calcium, magnesium and potassium salts of arabic acid.

Arabic acid on hydrolysis gives L-arabinose, D- galactose and D-glucuronic acid.It is also contains an enzyme oxidase and peroxidase.

Bark: bark contains several polyphenolic compounds, catechin, epicatechin, quercetin, gallic acid, sucrose, tannin, M- digallic acid and chlorogenic acid.

Seeds: they contain amino acids, fatty acids, ascorbic acid and more tannin.

Materials and Method

Collection and Authentification of Plant Materials-

The fresh plant materials of polyherbal formulation were collected from local area of Bhanpura, Mandsaur (M.P.) India during month of September 2009. Preliminary identification and authentication was done by Dr. Rakesh Gupta, Department of Dravyaguna, SDPS Ayurved Medical College, Bhanpura, Dist. Mandsaur (M.P.) India. A voucher specimen was deposited to herbarium of SDPS Ayurved Medical College vide specimen no. SDPR/09/PS/115.

Preparation of Polyherbal Formulation

The plant material fruit of Syzygium cumini.The jamun seed was dried and powdered and a suspension of 100 g in 200 ml of distilled water was stirred magnetically overnight at room temperature.These was repeated three consecutive times. The extract was evaporated to dryness under in a reduced pressure in a rotarty evaporator .The resuidal extract was dissolved in saline and used in the study.

Fresh fruit of Momordica charantia 10 mg of dried sample was boiles at 100 °C in 100 ml of distilled water for 10 min .Then cooled at room temperature for 20 min and filtered. The water extract prepared daily before administration.

Acacia arabica the gummy excudation The dried fruit of Acacia arabica were finely powered and extracted by boiling with water for 2 hours.After extraction the extract was dried in a water bath at a temperature 35- 40°C.

Preliminary Phytochemical Screening-

Preliminary phytochemical screening were performed for all extracts for the presence Of phytochemical like alkaloids, glycosides, flavones, tannis, terpenes, sterols, saponins, Fats and sugars, using standard qualitative assays(789)

Animals-

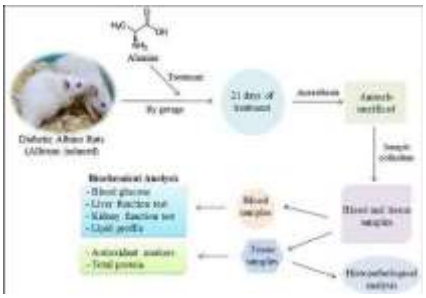
Albino rats (Wistar) of either sex weighing between 150-200 g were used in this study.The animals were allowed to acclimatize to laboratory condition (25±2°C) for 10 days After their arrival. The animals were housed into group of six under standard housing Conditions and maintained in a 12:12 light: dark cycle. The animal were fed with Standard rat feed (Amrut Rat Feed, India) and allowed water ad libitum.

Acute toxicity studies

The acute toxicity test of the polyherbal formulation was determined according to the OECD guidelines no. 420 (Organization for Economics Co-operation and Development). Female and male wistar rats (150-200 g) were used for this study. After the sighting study, starting dose of 2000 mg/kg (po) of the test samples were given to various groups containing 5 male and 5 female animals in each groups. The treated animals were monitored for 14 days for mortality and behavioral, neurological and autonomic response. No abnormal behavioral, neurological, autonomic changes and death was observed till the end of the 14th day. The test samples were found to be safe up to the dose of 2000 mg/kg. From the results obtained, 100, 200 and 300 mg/kg dose were chosen for further experimentation as the maximum doses to be administered.

Induction of Diabetes

Diabetes was introduced to overnight fasted rats by single intraperitoneal injection of Freshly prepared alloxan monohydrate solution (150 mg/kg). Since alloxan is capable of Producing fatal hypoglycemia as a result of massive pancreatic insulin release, rats Were treated with 20% glucose solution orally after 6 h. The rats were then kept for the Next 24 h on 5% glucose solution bottles in their cages to prevent hypoglycemia. Blood Glucose level was detected by using commercially available kit (Accu-Chek Active Test Meter) and rats showing hyperglycemia with blood glucose >200 mg/dl 48 h after Alloxan monohydrate injection were selected for the experimental.



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