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Formulation and Evaluation of Polyherbal tablet of anti diabetic

Manish Ramdas Kadam, Shivjeet Ramesh Jadhav, Vinit Ganpat Kale, Poonam Jadhav

Student, Student, Student, Professor.

Final Year Bachelor of pharmacy Shankarrao Ursal College Of Pharmaceutical Sciences And Research Centre,Kharadi Pune

Introduction

Diabetes and pre-diabetes are serious conditions in which people have high levels of sugar or glucose in their blood. The World Health Organization (WHO) reports that more than 420 million people worldwide live with diabetes. In the US, according to the US Centres for Disease Control and Prevention (CDC), over 30 million people have diabetes, and 88 million adults have pre-diabetes (blood sugar levels are higher than normal, but not high enough to be diagnosed with type 2 diabetes). Diabetes is a major cause of blindness, amputation, kidney failure, and cardiovascular disease. Glucose is a type of sugar that is used as fuel by the body. When you eat, your body converts food into glucose. The glucose then goes into your bloodstream and is carried throughout the body to provide energy to all of your cells. In order for glucose to move from your bloodstream into your cells, you need insulin. Insulin carries the glucose, or sugar, in your bloodstream into your cells. Insulin is a hormone made by the pancreas, an organ in the upper part of your abdomen (belly).

If your body has a problem making or using insulin, the glucose in your bloodstream cannot get into your cells. As a result, glucose stays in the blood (high blood sugar) and the cells do not get enough glucose. A diagnosis of pre-diabetes or diabetes is made when glucose stays at

higher-than-normal levels (also called hyperglycemia) knowledge and experimental database can provide researcher with new lead molecule to reduce time, toxicity and expenditure in drug development process

There are several types of diabetes:

Type 1 Diabetes (Insulin Dependent)

The pancreas does not make any insulin.You must take insulin every day to survive, Usually begins in childhood or adolescence

Type 2 Diabetes (Non-insulin Dependent)

Your pancreas makes some insulin (but usually not enough), and/or the body does not respond normally to the insulin your body does make (sometimes referred to as 'insulin resistance")

Some people with type 2 diabetes are able to control it with diet and exercise; many others need diabetes medication, and some need insulin.

Objective :

1. Global Impact of Diabetes: Highlight the significant prevalence of diabetes and pre-diabetes worldwide, as reported by WHO and CDC, emphasizing the urgent need for effective management and treatment.

2. Health Implications: Outline the serious health consequences associated with diabetes, such as blindness, amputation, kidney failure, and cardiovascular diseases, underscoring the importance of addressing this public health challenge.

3. Understanding Glucose and Insulin: Explain the role of glucose as a vital energy source for the body and the necessity of insulin in transporting glucose into cells, setting the foundation for understanding the mechanisms underlying diabetes.

4. Challenges in Diabetes Management: Describe the physiological issue of insulin deficiency or resistance leading to hyperglycemia (high blood sugar), which characterizes pre-diabetes and diabetes, laying the groundwork for innovative research in therapeutic interventions.

5. Research Aim: Highlight the potential of knowledge and experimental databases in facilitating drug discovery, specifically in identifying new lead molecules for diabetes treatment, aiming to streamline drug development processes in terms of time, toxicity, and cost.

Formulations Used-

Sr .no.	**Herb used (powder)**	**Part of herbs used**	**Quantity taken (Dose)**
1	Papaya	Leaves	40mg
2	Neem	Leaves	40mg
3	Ginger	Buds	40mg
4	Curry Leaves	Leaves	40mg
5	Jamun	Leaves	40mg

EXCIPIENT USED

Sr.no	**Excipient**	**Quantity taken**	**Use in formulation**
1	Magnesium Stearate	2.5mg	Lubricant
2	Talc	2.5mg	Filler
3	Lactose(monohydrate)	30mg	Binder

4	HPMC	22mg	Binder
5	Strach	3mg	Disintegrant
6	Starch Paste	q.s	Granulating fluid

Method of preparation of Polyherbal tablet of anti diabetic:

To address the growing concern of diabetes and pre-diabetes, developing effective treatments like polyherbal tablets can be promising. Polyherbal formulations combine multiple medicinal plants to synergistically combat the complexities of diabetes. The preparation of polyherbal anti-diabetic tablets involves several key steps.

1. Selection of Herbs: Identify and select herbs known for their anti-diabetic properties. Common herbs include bitter melon, fenugreek, cinnamon, and ginseng, each with unique bioactive compounds that aid in managing blood sugar levels.

2. Standardization: Establish standardized criteria for the herbal ingredients to ensure consistent potency and efficacy across batches. This involves determining the optimal concentration of active compounds in each herb.

3. Extraction: Extract bioactive compounds from selected herbs using suitable solvents like ethanol or water. Various extraction methods (e.g., maceration, percolation, Soxhlet extraction) can be employed based on the herb's properties.

4. Formulation: Combine the standardized herbal extracts in specific ratios to create a synergistic blend that enhances the anti-diabetic effect. Add excipients like binders and disintegrants to facilitate tablet formation.

5. Granulation: Prepare granules by blending the herbal mixture with excipients. This step ensures uniform distribution of active ingredients and aids in the compression process.

6. Tablet Compression: Use tablet compression machines to compress the granules into tablets of desired size and shape. Apply suitable pressure to ensure tablet hardness and integrity.

7. Coating (Optional): Apply a coating to the tablets for taste-masking or to control release characteristics.

8. Quality Control: Implement rigorous quality control measures to assess the identity, purity, and potency of the final tablets. Testing for heavy metals, microbial contamination, and active ingredient content is essential.

9. Packaging: Package the finished polyherbal tablets in appropriate containers to maintain stability and shelf-life.

By following these steps meticulously and utilizing the synergistic potential of multiple herbs, polyherbal tablets can offer a holistic and effective approach to managing diabetes and its associated complications. This method underscores the importance of integrating traditional knowledge with modern pharmaceutical practices to develop safe and efficacious anti-diabetic formulations.

Evaluation of Polyherbal tablet of anti diabetic:

The evaluation of polyherbal tablets for their antidiabetic properties involves several important steps to ensure their efficacy, safety, and quality. Here's a general outline of the evaluation process:

1. Selection of Herbs: Identify and select specific herbs known for their antidiabetic properties based on traditional knowledge or scientific research. Common herbs might include bitter melon, fenugreek, cinnamon, ginseng, and others.

2. Standardization: Determine the active compounds or markers responsible for the antidiabetic activity in each herb. Standardize the herbal extract to ensure consistency in potency and quality of the final product.

3. Formulation: Develop a formulation that optimizes the synergistic effects of the selected herbs. This could involve testing different combinations and ratios to maximize efficacy.

4. Preclinical Studies:

- In vitro Studies: Test the polyherbal extract in laboratory settings to evaluate its effects on glucose metabolism, insulin secretion, and other relevant parameters.

- Animal Studies: Conduct studies using diabetic animal models to assess the efficacy and safety of the polyherbal formulation. Evaluate parameters like blood glucose levels, insulin sensitivity, lipid profile, and organ toxicity.

5. Clinical Trials:

- Conduct controlled clinical trials on diabetic patients to assess the efficacy and safety of the polyherbal tablets.

- Monitor parameters such as fasting blood glucose levels, postprandial glucose levels, HbA1c, insulin sensitivity, and lipid profile over a specified period.

6. Quality Control:

- Establish quality control measures to ensure consistency and purity of the polyherbal tablets.

- Test for heavy metals, microbial contamination, and other potential contaminants.

7. Safety Evaluation:

- Conduct toxicity studies to determine the safety profile of the polyherbal formulation.

- Monitor for any adverse effects or interactions with other medications.

8. Bioavailability Studies: Assess the bioavailability of active compounds from the polyherbal formulation to understand how they are absorbed and distributed in the body.

9. Regulatory Compliance: Ensure that the polyherbal tablets comply with regulatory standards for herbal medicines in terms of labeling, packaging, and manufacturing practices.

10. Long-term Studies: Evaluate the long-term effects of the polyherbal tablets on diabetic complications and overall health.

By systematically conducting these evaluations, researchers can gather comprehensive data on the efficacy, safety, and quality of polyherbal tablets for treating diabetes. This approach helps in establishing evidence-based guidelines for their use in clinical practice.

CONCLUSION

As per Ayurveda, there exists a huge collection of plants with antidiabetic potential. Only few of them have been scientifically proven and a lot more have yet to be explored and proved. Carica Papaya**,** Azadirachta Indica*,* noun dried ground gingerroot*,* Murraya koenigii*,* Syzygium jambolanum have shown varying degrees of hypoglycaemic activity. These plants have also been reported to contribute in control of complications of diabetes. Future studies may target isolation, purification, and characterization of bioactive compounds present in these plants. The outcome of such studies may provide a starting point for development of potential antidiabetic drugs. This review may be helpful in the management of diabetics

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