EVALUATION OF POLYHERBAL FORMULATION FOR ANTIDIABETIC ACTIVITY USING WISTAR RATS

A

Thesis

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SUMMARY AND CONCLUSION

A variety of metabolic disorders, including diabetes mellitus, are marked by hyperglycemia as well as impaired lipid, carbohydrate, and protein metabolism. The pandemic of diabetes is widespread and difficult to treat. The number of people with diabetes has more than doubled over the past 20 years. The disease's rapid expansion of type 2 diabetes in young adults, whose risk factor is enhanced by lifestyle, is its most alarming symptom. Epidemiological statistics show that disease is continuously spreading, hurting global health expenditures, and has been dubbed "the diabetes apocalypse".The prevention of disease should come before the treatmen to fit.

Since ancient times, humans have relied on plants and natural substances to support their health and well-being. References in Vedic literature and other ancient Indian texts highlight the use of specific plants for managing different ailments. The current study focuses on investigating a combination of two herbal plants: Sesbania Grandiflora leaves and Beta Vulgaris root, aiming to develop an antidiabetic formulation.

The usage of herbal medicines and associated items is widespread and has been growing exponentially over time. The study mentioned various utilities in the standardisation of crude drugs by pharmacognostic, physiochemical, phytochemical analysis and compatibility studies. High performance thin layer chromatography and phytochemical analysis are useful for confirm identity, quality and purity.

The results of the current *Invivo* investigation show that this polyherbal extract mixture has given significant ($p<0.05$) anti-diabetic properties and aids in maintaining stable glycemic and metabolic levels. In both healthy and experimentally induced hyperglycaemic (Streptozotocin caused) rats, the herbal preparation produces antidiabetic effects. It was found to be nontoxic up to 2000 mg/kg BW in acute toxicity testing conducted under OECD guidelines. The herbal formulation may exert its effects via extra-pancreatic as well as pancreatic mechanisms. In Streptozotocin-induced diabetic rats, the extract markedly lowered blood sugar levels by decreasing lipid peroxidation and enhancing enzymatic antioxidants in pancreatic tissue. Long-term therapy also demonstrated mitigation of Streptozotocin-induced histological damage to the islets of Langerhans, as confirmed by histopathological investigations.

The 400mg/kg dose of the herbal formulation nearly had the same inhibitory effects on biochemical and histological measures as the standard medication Glibenclamide (5mg/kg). This excerpt demonstrated enhancements in various metrics such as body weight, food intake, organ mass, and biochemical markers, suggesting its potential value in managing diabetes. The formulation of a polyherbal blend was optimized by determining the optimal ratio of methanolic extracts from Sesbania Grandiflora leaves and Beta Vulgaris roots. The synergistic effects of this combination offer superior therapeutic benefits compared to each plant extract used individually.

Optimized ratio of both extracts is obtained by OGTT on Wistar albino rat which are used further for developing formulation. The developed dispersible polyherbal formulation is directly compressed tablet and preformulation and tablet evaluation is performed for fourdesigned batched which differ from each other by different concentration of MCC.

Based on pre- and post-formulation testing findings and stability data of tablets from variousbatches, it is decided that batch no. **F3's** results are excellent compared to those of otherbatches.

FUTURE SCOPE

In both developing and developed nations of the world, the market for herbal medicines andother herbal healthcare goods is in a phase of rising demand. Due to their distinctive qualities, herbal materialshave thus opened up a brand-new, interesting subject for future research in all sciences, particularly in medicine.

The active components found in plants have quickly accelerated up the development of phytochemistry and pharmacognosy and are used against diabetes, cancer, and other diseases avoiding heart disease and reducing the ageing process.