REVIEW ARTICLE ISSN: 2349-2678

Contents lists available at www.ijpba.in
International Journal of Pharmaceutical and Biological Science Archive
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2017: 71.80
Volume 8 Issue 3; July-August; 2020; Page No. 01-03

REVIEW ON SCREENING & EVALUATION OF ANTI-DIABETIC SPECTRUM OF WITHANIA COAGULANS

Sweta Kumari [1], Yogesh Kumar Sharma2, Dr. Mayank Bansal[3]
[1] M.Pharm Student (Pharmacology), Jaipur College of Pharmacy, Jaipur, Rajasthan
[2] Department of Pharmacology, Jaipur College of Pharmacy, Jaipur, Rajasthan
[3] Professor and Principal, Jaipur College of Pharmacy, Jaipur, Rajasthan, India
Conflicts of Interest: Nil
Corresponding author: Sweta Kumari

ABSTRACT

Diabetes mellitus is a metabolic disorder. This review article is planned to The anti-diabetic effect of Withania Coagulans have been successfully used in Ayurvedic and other traditional formulations and found to be efficient and inexpensive as compared to synthetic drugs. It also aims to test and verify the W. coagulans fruits, showed significant inhibition on postprandial rise in hyperglycemia post-sucrose load in normoglycemic rats as well as streptozotocin-induced diabetic rats. which is comparable to the standard antidiabetic drug Glibenclamide for medical care, The present study defines the systematic evaluation and the role of minerals in glycemic potential of aqueous extract of Withania coagulans fruits in order to develop an effective and safe alternative treatment for diabetes mellitus.

These study conducted to determine the antidiabetic effect of Withania coagulans and pancreatic histological features in streptozotocin induced diabetic rat.

Keywords: Anti-Diabetic effect, Screening & Evaluation, Streptozocin, Glibenclamide, Diabetic rats.

INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by a predisposition to developing significantly raised blood glucose, caused by the inability of the pancreas to produce insulin or to use the insulin produced in the proper way. Diabetes mellitus has been noted in almost all cultures, Diabetes is a major public health problem.

In normal individuals, glucose concentrations are tightly regulated by a number of hormonal factors. The disordered regulation of glucose metabolism that results in diabetes is usually due to a deficiency of insulin release from the pancreas and a reduced response to insulin.

ETIOLOGY

Type 2 diabetes mellitus (T2DM) is by far the more common type of diabetes and is characterized by insulin resistance resulting from defects in the action of insulin on its target tissues (muscle, liver, and fat), but complicated by varying and usually progressive failure of beta cells' insulin secretary capacity. Most patients with T2DM in the US and Europe are obese, however in India and China, most T2DM patients have a lean body mass index (BMI), albeit with increased visceral and hepatic fat.

Common Causes of Anti-diabetic

1. Sedentary lifestyle
2. Obesity (weighing 21 percent above a healthy body weight)
3. Family history of diabetes
4. Improper functioning of the pancreas
5. Minority race (higher risk in Black, Hispanic and native Hawaiian populations)
6. Medication (cortisone and some high blood pressure drugs)
7. Women having given birth to a baby weighing more than 9 lbs.
8. Previously diagnosed gestational diabetes.

OBJECTIVE

The use of Withania coagulans, a member of the solanaceae family, has been highlighted in

Ayurveda. We have reviewed the chemical constituents and pharmacological properties of W. coagulans, as well as its morphology.

This has included therapeutic effects of the whole plant and its extracts, fractions and isolated withanolides. The Antidiabetic, hepatoprotective, anti-inflammatory, antihyperglycaemic, hypolipidaemic, free radical scavenging, antimicrobial, cardiovascular, central nervous system depressant, immunomodulating, antitumour and cytotoxic activities of W. coagulans have been described.

PLAN OF WORK

- Collection, authentication, storage and size reduction of plant material.
- Standardization of plant material according WHO.
- Extraction of dried fruit of withania coagulans.
- Phytochemical investigation of extract by chemical test.
- TLC analysis of extract.
- Study of anti-diabetic effect of withania coagulans of various dose of different model.
- Study of anti-diabetic activity of various doses of withania coagulans by in vivo model.
- W. coagulans Dunal, is commonly known as 'Indian cheese maker' or 'vegetable rennet' because fruits and leaves of this plant are used as a coagulant.
- The milk coagulating property of the fruits is attributed to the pulp and husk berries which contain an enzyme called Withanin, having milk-coagulating activity.
- One ounce of the fruits of W. coagulans when mixed with 1 quart of boiling water makes a decoction, one table spoonful of which is capable to coagulate a gallon of milk in just an hour. In Pakistan, the berries of W. coagulans are commonly used to clot milk which is called, 'paneer'. The milk of buffalo or sheep is boiled to 100oF and treatedwith crushed berries of the plant, tied in a cloth. This causes the milk to curdle within 30-40 minutes.
- Treatment with coagulanolide4 along with four known withanolides 1-3 and 5 isolated from W. coagulans fruits, showed significant inhibition on postprandial rise in hyperglycemia post-sucrose load in normoglycemic rats as well as streptozotocin-induced diabetic rats.
- The compound 5 also caused significant fall in fasting blood glucose profile and improved the glucose tolerance of db/db mice. Further, compound 5 showed antidyslipidemic activity in db/db mice.
- The median effective dose of the compound 5 was determined to be around 25 mg/kg body weight in streptozotocin-induced diabetic rats, which is comparable to the standard antidiabetic drug metformin.

This explains the traditional use of W. coagulans as antihyperglycemic cum antidyslipidemic agent by the traditional medical practitioners.

Treatment Data

- The dose of 1000mg/ kg was identified as the most effective dose, which reduces the Fasting Blood Glucose level maximum by 33.2% at 4h in normal rats during fasting blood glucose studies.
- Glucose tolerance test studies of normal, sub and mild diabetic rats showed the maximum reduction of 15.7, 28.9 and 37.8% at 3h respectively. Long-term study in case of severely diabetic rats showed reduction of 52.9 and 54.1% in Fasting Blood Glucose and Post Prandial Glucose levels respectively after 30 days of treatment.

The present study, besides confirming hypoglycemic and antidiabetic activities of aqueous extract of W. coagulans, helps in identifying the role of trace minerals like Mg & Ca responsible for antidiabetic potential of this potent indigenous shrub

Reference

1. Goodman and Gilman's., "The pharmacological basis of therapeutics. "10th Ed.,Mcgraw-Hill Prakashan, New Delhi,2001,1679-1714.

2. Tripathi K.D.,"Essential of Medical Pharmacology." 5thEd., Jaypee Brother Pvt.Ltd.,New Delhi,2003,233-253.
3. Diabetes mellitus: http://www. en.wikipedia.org/wiki/diabetes.html on 10/05/18
4. Soumyanatha A.," Traditional Medicine for Modern Times: Antidiabetic Plants." Taylor and Francis Group,2006,19-61.
5. Borassus flabellifer: http://www. rain-tree. com/cormama./tropical plant database. html on 09/02/20
6. Kirtikar, K.R. and Basu,"Indian Medicinal Plants." Vol. I – IV. 2nd Ed. Jayyed Press, New Delhi, B. D. 1975.
7. Singh V. and Pandey R. P., "Ethnobotany of Rajasthan," Scientific Publishers, India, 1998.
8. Paranjape P.,"Indian medicinal Plants: Forgotten herbs," , Chaukhamba Sanskrit Prathisthan,New Delhi, 2007.
9. P. Zimmet, K. G. M. M. Alberti, and J. Shaw, "Global and societal implications of the diabetes epidemic," Nature, vol. 414, no. 6865, pp. 782–787, 2001.View at: Publisher Site
10. L. Rossetti, A. Giaccari, and R. A. DeFronzo, "Glucose toxicity," Diabetes Care, vol. 13, no. 6, pp. 610–630, 1990.