

Effect of polyherbal formulation on experimental model of high fructose diet induced metabolic syndrome

Rohith N Thota, Ravindar Naik R, Anantha S Metlakunta, Benarjee G and Goverdhan puchakayala
Vaagdevi College of Pharmacy, India

Aim: The objective of the present study is to evaluate the efficacy of herbal formulation (350 mg/kg Body Weight and 500 mg/Kg Body Weight) in ameliorating the clinical symptoms of metabolic syndrome established in high fructose diet (65% Fructose) fed male Wistar rats.

Methods: Adult male wistar rats (aged 6 weeks) weighing 150-170 g were fed with 65% high fructose diet (n=18) or standard diet (n=6) for 4 weeks to induce metabolic syndrome. The rats were then randomized into groups and administered with herbal formulation of dose 350 mg/kg and 500 mg/kg orally using oral gavage for 3 weeks. Feed and water intake are measured daily throughout the experiment. Body weights, abdominal waist and BMI are measured twice a week. Blood samples are collected from rats by retro orbital puncture at 7th week for analysis of serum biochemical parameters like fasting glucose levels, triglycerides, total cholesterol, HDL, LDL, VLDL, SGPT, SGOT, uric acid and Malondialdehyde (MDA) levels. The systolic blood pressure was calculated at 7th week using NIBP. The animals were anaesthetized using diethyl ether and sacrificed to isolate the organs Liver, kidney, spleen, heart, lungs, testis and muscles (plantaris, soleus and gastronomies). The fat pads (mesenteric, retroperitoneal and epididymal) are isolated and weighed. The liver and pancreas were separated and placed in 10% formalin and evaluated for significant histological changes.

Results: Polyherbal formulation administered in wistar rats ameliorated the clinical symptoms established in high fructose diet induced metabolic syndrome. The polyherbal formulation (350mg/kg Body Weight and 500 mg /kg Body Weight) lowered the fasting serum blood glucose levels (p<0.001), triglycerides (p<0.001), total cholesterol, SGOT, SGPT, Uric acid (p<0.001), MDA (p<0.001) and improved HDL-C levels (p<0.001). The effect of polyherbal formulation was minimal on elevated systolic blood pressure. The polyherbal formulation of higher dose hindered weight gain in high fructose fed rats. It also decreased abdominal waist, organs and fat pads weight. Histopathology results indicated the infiltration of inflammatory cells, necrosis, focal fatty accumulation in high fructose diet which was ameliorated by polyherbal formulation (500mg/kg), whereas mild changes were observed in liver and pancreas of rats treated with formulation (300 mg/kg).

Conclusion: Polyherbal formulation (350 and 500 mg/ kg Body Weight) significantly suppressed the cluster of metabolic abnormalities in constellation of metabolic syndrome. These findings suggest therapeutic use of this formulation as a beneficial natural alternative in treating the metabolic syndrome.

Biography

Rohith Nagendra Thota completed master's degree in pharmacology from Pharmacological screening and Herbal drug studies, Department of Pharmacology, Vaagdevi college of Pharmacy. Rohith is awarded with child scientist at National Children Science Congress- 2003, Lucknow and has Profound interest in research of diabetes and metabolic disorders. Goverdhan Puchchakayala has completed his PhD at the age of 32 years from Kakatiya University and postdoctoral studies from Tuebingen University School of Physiology. He is the professor and Head department of Pharmacology, Vaagdevi college of Pharmacy and director of synapse life sciences, a preclinical organization. He has published more than 30 papers in reputed journals.

t_rohith@yahoo.com