Efficacy of a Novel Polyherbal Formulation in the Management of Induced Hyperglycaemic and Hyperlipidaemia in Rat Models

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The present study was undertaken to investigate the effectiveness of decoction of a novel poly-herbal formulation consisting of equal proportions of 10 medicinal plant materials in managing hyperglycaemic and hyperlipidaemic conditions using six different experimental rat models which included normal healthy rats, hyperlipidaemic rats as well as drug induced Type I and Type II Diabetic rats. In normal healthy rats, short term (14 days) and long term (90 days) oral administration (10.8 ml/kg body weight/day) of three different strengths of the decoction ($D_{1\ (8\rightarrow1)}$, $D_{2\ (8\rightarrow0.5)}$ and $D_{3\ (8\rightarrow0.25)}$) corresponding to 2.7g, 5.4g, and 10.8g of the initial plant materials per dose respectively showeddose dependent effects on serum glucose and lipids levels.$D_{2(8\rightarrow0.5)}$decoction was evaluated further and potential side effects of the treatments were assessed based on key hepatic enzymesand creatinine in the serum, haematological profile and histology of liver, kidney and pancreas in different experimental rat models. Long term administration of $D_{2(8\rightarrow0.5)}$ decoction exhibited significant decreases in fasting serum glucose (31-66%), total cholesterol (24-60%), triglycerides (27-59%,), LDL(43-80%) and VLDL(29-59%) levels and significant increase in HDL (9-66%) levels in addition to recovery of dietary induced liver steatosis conditions in respective rat models. Adverse effects of long term administration of the $D_{2\ (8\rightarrow0.5)}$ decoction were not found in relation to the haematological profile, key hepatic enzymes, & creatinine in the serum and histological structure of the tested organs. In conclusion, long term oral administration of the $D_{2(8\rightarrow0.5)}$ decoction is effective in reducing hyperglycaemic and hyperlipidaemic conditions without causing adverse side effects in different experimental rat models.

Key words: *Diabetes Mellitus; Hyperglycaemia; Hyperlipidaemia; Polyherbal Formulation.*