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Management of induced diabetic complications by Gymnadenia orchidis root Salep and pumpkin seed synergistically

Subiah H Arzoo
Jadavpur University, India

Statement of problem: Insulin deficiency or its inactiveness both causes diabetes mellitus which is the most prevalent metabolic disorder of human population. Synthetic drugs and insulin therapy against diabetes possess numerous drawbacks. Diabetic people are advised to choose low-glycemic food and herbal products to control diabetes. This study evaluated the synergistic supplementary effects of Gymnadenia orchidis Lindl root Salep and pumpkin seed powder on Streptozotocin induced type-2 diabetic mice.

Methodology & Theoretical orientation: Animals were divided into 6 groups of which 2 groups were taken as Normal and Food Control and rest 4 groups were made diabetic by Streptozotocin. One diabetic group was kept as control, and the other three groups supplemented with effective dose (200 mg/kg of body weight) of root Salep, pumpkin seed powder (5%) mixed food and both Salep and pumpkin seed food respectively. Changes in various biochemical parameters, DNA content and damage, liver, kidney and pancreas structures were noted after 21 days treatment. Data were analyzed by ANOVA for statistical significance.

Findings: The diabetic mice presented significant increase in glucose, HbA1c, liver, kidney and lipid parameters compared to the control group ($p<0.001$), which was confirmed by considerable damage of liver, kidney and pancreatic tissues in histological examination. Antioxidant enzymes levels also decreased in diabetic mice ($p<0.001$). Diabetic mice administered with root Salep and supplemented with pumpkin seed restored the biochemical alterations, antioxidant enzymes levels ($p<0.001$) and histological features especially of pancreas. Induction of diabetes caused considerable reduction in DNA content and severe DNA damage which was more effectively repaired by administration of root Salep and pumpkin seed. Terpenoids of root Salep and antioxidants of pumpkin seed may play the active role against diabetes.

Conclusion & Significance: The root Salep and pumpkin seed synergistically prevent diabetic complications and could be the better management for type-2 diabetes.