Amin MM 2015: Histomorphology of the pancreas and liver treated with herbal extracts in alloxan induced diabetic mice, MS Thesis, Department of Anatomy and Histology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh.

ABSTRACT

Diabetes mellitus is a group of metabolic diseases, entailing enormous financial burden and identified as one of the main threats to human health in the 21st century. All the existing therapies of diabetes have limited efficacy, confined tolerability and/or significant mechanism based side effects. Plant drugs and formulations are considered to be less hazardous and free from side effects than the synthetic ones. Synergistic and potentiative anti-diabetic effect may be provided for the presence of a wide range of phyto-constituents in them. The current research was designed to investigate the histomorphology of the pancreas and liver after the treatment with the herbal extracts (*Syzygium cumini* seeds, *Ficus racemosa* fruits and their combination) in alloxan induced diabetic mice, which was carried out at the Department of Anatomy and Histology, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh. Young Swiss albino mice (*Mus musculus*) (aged 4-5 weeks; average weight 25-28g), purchased from the ICDDR,B were divided into 6 (six) groups of 5 (five) each. Diabetes mellitus was induced by single intra-peritoneal injection of alloxan monohydrate (150 mg/kg body weight) dissolved in physiological saline in overnight fasted mice. The combined ethanolic extracts of *S. cumini* seeds (SCEE) and *F. racemosa* fruits (FREE) at low doses (250mg/kg body weight SCEE and 125mg/kg body weight FREE) was administered orally once daily for 30 days in comparison to their individual treatments (500mg/kg body weight SCEE and 250mg/kg body weight FREE, respectively) and a standard hypoglycemic drug, glibenclamide (600µg/kg body weight). Fasting blood glucose level was evaluated in normal and diabetic mice on 15 (fifteen) days intervals. At the end of the experiment, mice were sacrificed by cervical sub-laxation method and histomorphological examination of the pancreas and liver was performed. Research results revealed that among the treated groups, glibenclamide (49.76%) showed the best anti-hyperglycemic effect. Whereas, among the herbal extract treated groups, the combined extract (47.09%) had the highest improvement in comparing to the diabetic control. On the otherhand, SCEE & FREE had much lower effect (36.89% & 31.37%, respectively). The standard drug and combined extract were also able to produce more improvement in the mean weight, length and diameter of the pancreas and liver than the individual treatment. Necrotic spot and nodules, found in the diabetic liver were restored to normal in the treated groups. Histologically, necrosis in the islets and focal acinar damages were also returned to normal. Central vein degeneration and hepatic cords distortion with dilatation of hepatic sinusoids were restored near to normal in the treated groups. It might be concluded from the study that the combination therapy of *S. cumini* seed ethanolic extract (SCEE) and *F. racemosa* fruit ethanolic extract (FREE) showed better restoration in the anatomical and haematological changes of the diabetic mice than the individual treatment. This polyherbal therapy could reduce the drug over dosing and ultimately aid the human being to have an inexpensive, safe and more effective drug for diabetes. It would be a great scope for the veterinarians to prescribe this natural and effective herbal extract for the treatment of diabetic animals specially the dogs and cats.

Key words: *Histomorphology, Diabetes, Herbal extract, Pancreas, Liver, Alloxan, Swiss albino mice*