

ABSTRACT:

Background: Diabetic mellitus (DM) is dubiously known for its long-term micro and macrovascular complications such as retinopathy, neuropathy, nephropathy and cerebrovascular accidents. The outcomes of these complications are increased hospitalization, economical burden and mortality.

Aim: Present study was aimed to evaluated the efficacy of *Tribulus terrestris* and *Pterocarpus marsupium* in prevention and reversion of diabetic complications in Nicotinamide-Streptozotocin(NA-STZ) induced diabetic rats.

Materials and Methods: Study was conducted in two phases. In phase-1, treatment was started on 7th day after induction of diabetes and continued for 16weeks, whereas in phase-2, treatment was started 4weeks after induction of diabetes and continued for another 4weeks. Glycaemic (glucose, HbA1c, insulin), renal (urea, creatinine, microalbuminuria), hepatic (AST, ALT, GGT enzymes) and lipid (TC, TG, HDL) profiles and tests relating to retinopathy (Aldose Reductase (AR) activity and GSH in lens), neuropathy (Morris water maze test (MWM)) and inflammation (IL-6, IL-10 cytokines in serum and kidney) parameters were estimated in both phases. At the end of the study histopathology of pancreas, liver and kidney were examined.

Results/Discussion: Diabetic control (DC) rats displayed high glucose, HbA1c, insulin, urea, creatinine, microalbumin and liver enzymes and lipid levels. AR activity in lens, IL-6 and IL-10 in serum were significantly elevated and GSH levels in lens drastically reduced in DC compared to normal controls. Both plant extracts in phase-1 showed satisfactory results by effectively controlling the glycemic, renal, liver and lipid profiles. AR activity was significantly reduced in lens and sciatic nerve homogenate and GSH was improved in lens after treatment. Diabetic rats treated with plant extracts showed reduction in escape latencies during MWM test and showed the swiftness in learning a task. Plant extract treatment in non-diabetic rat showed inflammation to the liver which was evident by increased lymphocyte infiltration under microscopic examination. Positive control glibenclamide group showed encouraging results in pahse-1 and phase-2 studies. In pahse-2, treatment with only plant extract showed inadequate results in all estimations. While,

plant extracts combination with glibenclamide showed improvement in glycaemic profile and exerted anti-inflammatory potential.

Conclusion: Although *T.terrestris* and *P.marsupium* extracts seems to be effective in preventing the progression of diabetic complications, they are ineffective if given alone to revert the complications in diabetes and requires to be combined with glibenclamide for anti-inflammatory and antidiabetic activities.