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Renoprotective effect of *Prunus amygdalus* seed extract on streptozotocin-induced diabetic nephropathy rats

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Statement of the Problem: Poor glycemic control, accumulation of oxidative stress and inflammation play a significant role in the development of diabetic-nephropathy (DN). To develop functional food as alternative/natural medicine, the present study investigated the effect of *Prunus amygdalus* (sweet almond) in streptozotocin-induced DN in rats.

Methods: Diabetes was induced by a single injection of streptozotocin (STZ, 45mg/kg, i.p.). STZ-diabetic rats (eight animals/group) were daily treated orally (for 12 weeks) with hydroalcholic seed extract of *Prunus amygdalus* (40, 60 or 125mg/kg) or standard anti-diabetic drug, glibenclamide (10mg/kg). Blood glucose, body weight and urine volume were measured weekly. At 12 weeks, serum creatinine (SC), serum cystatin C (SCC), blood urea nitrogen (BUN) and total urinary protein (UP) levels; oxidative biomarkers-LPO, GSH, SOD and catalase; inflammatory biomarkers-IL-1β and TNF-α were measured. Histopathological studies of kidneys were done. Data was analyzed using one-way repeated measure ANOVA followed by Mann-Whitney test.

Results: *Prunus amygdalus* significantly decreased blood glucose ($p<0.001$) in dose-dependent manner in diabetic rats. Chronic diabetic model of 12 weeks produced DN as was evident by significant increase in SC, SCC, BUN and total UP levels; significant increase in LPO, decrease in GSH, SOD and catalase, and significant increase in IL-1β and TNF-α level. *Prunus amygdalus* in all the three doses significantly reduced ($p<0.001$) SC, SCC, BUN and total UP levels but the level was still higher than control rats. BUN level was statistically equal to control rats. The levels of LPO, GSH, T-AOC oxidative biomarkers and inflammatory biomarker, TNF-α studied were comparable to values in control rats. Though SOD, catalase and IL-1β levels were decreased but still higher than control rats ($p<0.01$). No histopathological changes were seen in the diabetic kidney.

Conclusion & Significance: Present findings provide evidence in experimental diabetic nephropathy that *Prunus amygdalus* seed extract has potential to be used as adjuvant for treatment of DN.

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