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Amelioration of renal nephropathy in streptozotocin-induced diabetic rats by revesterol loaded pectin nanoparticles in via targeting NF-κB and TGF-1β pathways

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Objectives:

Diabetic nephropathy (DN) is a severe diabetes mellitus complication whose cycle of expansion is ass ociated with inflammation and fibrosis. The objective of present study is to fabricate, optimize and evaluate the revesterol loaded pectin nanoparticles (PC-RVNPs) on renal nephropathy in streptozotocin-induced diabetes in rat.

Methods:

Pectin nanoparticles (PC-RVNPs) were prepared by the ionic gelatin method. Optimized nanoparticles were scrutinized for the entrapment efficiency, particle size, polydispersity index, SEM, FTIR and in vivo study. Rats were categorized into different groups and single i.p. injection of 55mg/kg of streptozotocin was given to rats to induce the diabetic nephropathy. Renal and serum was used to determine the biochemical parameters. Pro-inflammatory cytokines, renal damage expression, fibronectin and transforming growth factor-β1 were also estimated for underlying mechanism.

Results: Supplementation of the nanoparticle (PC-RVNPs) increases the bodyweight and insulin in plasma of rats and downregulated the level of BGL. There wasalso significantly reduction in the Pro-inflammatory cytokines (IL-6, IL-1β, TNF-α) and changes the expression of fibronectin, nuclear factor κB (NF-κB) p65 activity and transforming growth factor-β1 (TGF-1β) in the renal tissue of diabetic rats

Conclusions: PC-RVNPs protects the development of diabetic nephropathy via altering the expression of nuclear factor κB (NF-κB) p65 activity and transforming growth factor-β1 (TGF-1β).