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## **Nephroprotective potential of Gallic acid metformin against Streptozotocin induced diabetic nephropathy in Wistar rats via inhibition of DPP-4 and TGF- $\beta$**

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**Objectives:** The current experimental study was made attempt to explore the renal protective effect of gallic acid- metformin (GA-Met) against the STZ induced diabetic rats via inhibition of DPP-4 and TGF- $\beta$ .

**Methods:** GA-Met was scrutinizing against the DPP-4 inhibitor. GA-Met were also examined via Insilco study with the structure of DPP-4 to identify the critical interactions for its bioactivity. STZ was used for induction the type 2 diabetes and blood glucose level, biochemical, antioxidant, cytokines and inflammatory mediators were estimated.

**Results:** DPP-4 assay, GA-Met was found as potential drug with IC<sub>50</sub> value = 4.34  $\mu$ M. GA-Met Insilco interacted with various residue of DPP-4 inhibitor. GA-Met significantly reduced the blood glucose level (67%) and increased the plasma insulin level (45.5%). GA-Met improve the interstitial fibrosis, tubulointestinal injury and inflammatory cell infiltration in animal tissue. GA-Met exhibited the significantly decrease the level of TNF- $\alpha$  (45%), IL-1 $\beta$  (54.3%), IL-6 (56.1%), caspase-1 (43%), caspase-3 (40.4%), COX-2 (65%), PGE<sub>2</sub> (60.3%) and NF- $\kappa$ B (52.3%). Oxidative stress marker and the expression of transforming growth factor- $\beta$  (TGF- $\beta$ ) in the renal tissue of diabetic rats were significantly ( $P < 0.001$ ) altered by GA-Met treated group rats.

**Conclusions:** The current investigation suggests that GA-Met exert the renal protective effect against the STZ induced DN rats via inhibition of DPP4 and TGF- $\beta$ .