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## **Solid lipid nano-particles of quercetin to abrogate renal dysfunction in experimentally induced type II diabetic rats: An Anti-inflammatory therapy**

**Deeksha Chauhan<sup>1</sup>, V Kumar<sup>2</sup>**

<sup>1</sup>Department of Applied, Rajkamal Science Management College, India

<sup>2</sup>Department of Sciences, AAI-DU, India

**Objectives:** In the present study, we try to explore the molecular mechanism of Solid lipid nanoparticles (SLN) of quercetin in experimental induced DN in Streptozotocin (STZ) treated rats.

**Methods:** For SLN preparation, double emulsion displacement method was used. STZ (55 mg/kg) was used for the induction of DM and rats were divided into different group and received the treatment of QE and QE-SLN for 4 weeks. The body weight, plasma insulin, biochemical, antioxidant parameters were estimated, respectively. pro-inflammatory cytokines viz., TNF- $\alpha$ , IL-1 $\beta$  and IL-6 inflammatory mediator Nuclear transcription factor-kappa B (Nf-kB) and PGE<sub>2</sub> were scrutinized, respectively. NF-kB, IL-6 and TNF- $\alpha$  expression of renal were also estimated, respectively. The renal tissue was further used for the histopathological observation.

**Results:** QE-SLNs were evaluated for potential entrapment, particle size, drug release stability and gastric stability. QE-SLNs treatment demonstrated the down-regulation of blood glucose level and up-regulation of plasma insulin (25%), body weight (20%). Additionally, QE-SLNs treatment modulated the biochemical and antioxidant parameters. QE-SLNs treatment exhibited decreased level of IL-1 $\beta$  (32%), TNF- $\alpha$  (41%), IL-6 (29%), PGE<sub>2</sub> (34%) and Nf-kB (42%). Moreover, QE-SLNs showed the alteration in the expression of TNF- $\alpha$  and Nf-kB. Histopathology suggests the less necrosis, infiltrated blood vessels and less swelling in vessels.

**Conclusions:** We can conclude that QE-SLNs nano-formulation can prevent the Diabetic nephropathy via alteration of Nf-kB pathway.