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Amelioration of N-diethylnitrosamine (DEN) and ferric nitrilotriacetate (FE-NTA) induced renal cell carcinoma by Carissa carandas embedded silver nanoparticles in animal model via down regulating oxidative stress and inflammatory markers

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Objectives: Renal cancer is most common type, highly metastatic, forms as a single tumour on kidney and responsible for urological malignancies. The important function of NF-κB is to regulate inflammatory responses by regulating activation, survival and proliferation of cell. Subsequently, natural based products plays an important role in suppressing the proinflammatory mediators by nuclear factor-kappa B (NF-κB) pathway. The leaves of *Carissa carandas* (CC) utilizes as a folkfore drug for the treatment of renal cancer. So focussed on this contemplation, we assess the therapeutic efficacy of the *Carissa carandas* embedded silver nanoparticles as NF-kB inhibitors for renal cancer.

Methods: We fabricated silver nanoparticles using *Carissa carandas* (CC) aqueous extract acts as reducing and capping agent. Biosynthesized silver nanoparticles (AgNPs) were characterized by UV spectroscopy, X-ray diffraction, Transmission electron microscope and Field Emission Scanning Electron Microscope with Energy Dispersive
X-ray Analysis. Renal cancer was induced by DEN+FeNTA in wistar rats and further treated orally with silver nanoparticles of *Carissa carandas* (15 & 30 mg/kg b.wt.) for 16 weeks. The anticancer effects was assessed by measuring the renal toxicity markers, antioxidant parameter, proinflammatory markers and histopathology study of the wistar rats.

Results: AgNPs showed peak at 420 nm in UV spectroscopy with spherical structure and gives crystalline peak in XRD pattern. It show inhibitory potential against renal cancer by down regulated the serum marker enzymes (BUN, Creatinine) and tumour marker enzymes (G6PD), elevated levels of antioxidant enzymes (catalase, SOD, GPx), and diminish the levels of Proinflammatory mediators and cytokines (IL-6, IL-1b, TNF-α, and NF-κB). Histological features also showed recovery of a renal architecture in cancer induced rats in a dose dependent manner.

Conclusions: Biofabricated silver nanoparticles using *Carissa carandas* (CC) aqueous extract exhibited remarkable productive impacts against renal cancer in rats and serves as a novel targeted therapy for renal cancer by regulating cytokines and NF-κB.