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Nanocurcumin mediated amelioration on cellular and genotoxic complications of nicotine toxicated female population

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Nicotine, the addictive component of tobacco severely affects our health by aggravating damages both at cellular and genetic levels. The effect is more prominent in female population because women are more susceptible to nicotine-induced toxicity due to their low innate immunity. Curcumin, a nontoxic bioactive agent of turmeric significantly reduces nicotine-induced toxicity both at cellular and genetic levels. The clinical implication of native curcumin is hindered in the target cells due to its low aqueous solubility, poor bioavailability and poor pharmacokinetics. The problem was tried to overcome by preparing nanocurcumin (Cur-NPs) with a view to improve its aqueous solubility and better therapeutic efficacy against nicotine-induced toxicity. Female albino rats of Wistar strain were daily exposed to effective dose of nicotine (2.5 mg/kg, body weight injected subcutaneously) and supplemented with effective dose of curcumin (80 mg/kg body weight orally) or nanocurcumin (4 mg/kg body weight orally) for 21 days. The preventive efficacies of curcumin and nanocurcumin were evaluated against the changes in liver function enzymes, kidney function parameters, lipid profiles, lipid-peroxidation, antioxidant status and tissues damage, etc. The altered hemoglobin content, DNA content, DNA damage in blood cells due to nicotinic stress were significantly ameliorated by supplementation of nanocurcumin. Results revealed that nanocurcumin more effectively ameliorated the nicotine-induced toxicities at much lower concentration both at cellular and genetic levels due to its higher aqueous solubility and more bioavailability. The Cur-NPs can be used as a potential therapeutic agent for better efficacy against nicotine-induced toxicities than native curcumin.

Biography

Krishna Chattopadhyay has completed her PhD from the Department of Physiology, (2002) and Postdoctoral studies from the Department of Chemical Technology, University of Calcutta, India. Presently, she is working in the Chemistry Department of Jadavpur University as a Women Scientist, Department of Science and Technology, Government of India and also associated with School of Community Science and Technology, IEST, Shibpur, India as Guest Faculty. She has published several papers in reputed national and international journals and delivered talks in many international conferences. Her field of interest is nicotine toxicity, diabetes and natural antioxidants.

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