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Protective effects of melatonin against nicotine-induced oxidative damage of kidney

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Several studies demonstrated that melatonin treatment prevents tissue damage in various models of oxidative stress (1). Experiments have shown that chronic nicotine administration caused oxidant damage in various organs by increasing lipid peroxidation products and decreasing the activity of endogenous antioxidants (2). The aim of this study was to investigate the effects of melatonin treatment on nicotine-induced oxidative changes in rat kidney and to explore the possible mechanisms of action. Three groups of rats were used as controls (the first without treatment, the second with melatonin alone and the third with nicotine alone). The last group of rats was orally treated with nicotine and melatonin for 28 days. Morphological changes in kidney were evaluated by histological procedures and immunohistochemical analysis using inflammation (NFkB and IL-6) and oxidative stress (SOD, CAT and iNOS) markers. Experiments performed demonstrated that nicotine administration increases inflammation and oxidative stress. Melatonin has a protective effect against nicotine kidney toxicity through an inhibition of inflammation and consequent oxidative damage. These data suggest that melatonin supplementation effectively counteracts the deleterious effect of chronic nicotine administration on kidney and attenuates oxidative damage possibly by its anti-inflammatory and antioxidant effects.

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References

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Keywords
Kidney; nicotine; melatonin; inflammation; oxidative stress.