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Kidney protective effects of melatonin

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Implication for health policy/practice/research/medical education
Recent studies shown that melatonin administration, attenuated oxidative stress, inflammation, and restored renal function and structure in rats. Melatonin could be an attractive adjunctive therapy, since it is a natural, inexpensive, widely available, orally administered and relatively safe product.

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News and Views

Melatonin is a hormone produced in the pineal gland. Melatonin is produced of tryptophan and serotonin and is metabolized to 6-hydroxyl melatonin in the liver (1-3). Melatonin is a highly important antioxidant. Free radicals damages cells. Melatonin is an efficient neutralizer of free radicals (1,2). Melatonin plays an important role in various physiological processes including the regulation of circadian and endocrine rhythms, aging, the stimulation of immune functions and the prevention of the adverse effects of antibiotics, including renal failure (2-5). Melatonin reduces the oxidative induced brain, heart, kidney, and liver damage in rats. These effects of melatonin are related to scavenging of a variety of toxic oxygen and nitrogen based reactants and stimulation of antioxidative enzymes (1-5). Liver and kidney are metabolically highly active in xenobiotic metabolism and excretion, they have, compared to other organs, a greater load of free radical activity and thus are more prone to oxidative damage. Nephrotoxicity is an important side effect of contrast media, aminoglycosides, chemotherapy (2-6). In vivo and in vitro melatonin has been found to protect tissues against oxidative damage generated by a variety of toxic agents and metabolic processes, including chemotherapy induced toxicity and ischemia reperfusion injury in kidney, liver and brain (4-7). Melatonin has recently been found to protect against Adriamycin induced nephrotoxicity, aminoglycosides induced nephrotoxicity, and contrast media induced nephrotoxicity. Studies indicated that pretreatment with melatonin improves dramatically the histological and functional damage in this experimental model (3-7). In summary the studies showed that melatonin administration attenuated oxidative stress, inflammation, and kidney function and structure in rats. If proven effective, melatonin would be an attractive adjunctive therapy, since it is a natural, inexpensive, widely available, orally administered and relatively safe product (1-7).

Conclusion

Recent studies shown that melatonin administration, attenuated oxidative stress, inflammation, and restored renal function and structure in rats. Melatonin could be an attractive adjunctive therapy, since it is a natural, inexpensive, widely available, orally administered and relatively safe product.

Author's contribution

MT is the single author of the paper.

Conflict of interests

The author declared no competing interests.

Ethical considerations

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References

1. Hara M, Yoshida M, Nishijima H, Yokosuka M, Iigo M, Ohtani-Kaneko R, et al. Melatonin, a pineal secretory

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product with antioxidant properties, protects against cisplatin-induced nephrotoxicity in rats. J Pineal Res 2001; 30(3): 129-38.
2. Kucuktulu E. Protective effect of melatonin against radiation induced nephrotoxicity in rats. Asian Pac J Cancer Prev 2012; 13(8): 4101-5.
3. Kilic U, Kilic E, Tuzcu Z, Tuzcu M, Ozercan IH, Yilmaz O, et al. Melatonin suppresses cisplatin-induced nephrotoxicity via activation of Nrf-2/HO-1 pathway. Nutr Metab (Lond) 2013; 10(1): 7.
4. Ozguner F, Oktem F, Armagan A, Yilmaz R, Koyu A, Demirel R, et al. Comparative analysis of the protective effects of melatonin and caffeic acid phenethyl ester (CAPE) on mobile phone-induced renal impairment in rat. Mol Cell Biochem 2005; 276(1-2): 31-7.
5. Zararsiz I, Sarsilmaz M, Tas U, Kus I, Meydan S, Ozan E. Protective effect of melatonin against formaldehyde-induced kidney damage in rats. Toxicol Ind Health 2007; 23(10): 573-9.
6. Lee IC, Kim SH, Lee SM, Baek HS, Moon C, Kim SH, et al. Melatonin attenuates gentamicin-induced nephrotoxicity and oxidative stress in rats. Arch Toxicol 2012; 86(10): 1527-36.
7. Kalra S, Agrawal S, Sahay M. The reno-pineal axis: A novel role for melatonin. Indian J Endocrinol Metab 2012; 16(2): 192-4.