

## The Effect of Melatonin on Acute Liver Injury: Implication to Shift Work Related Sleep Deprivation

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**Abstract :** Shift work sleep disorder is a common problem in industrialized world. It is a type of circadian rhythmic sleep disorders characterized by insomnia and sleep deprivation. Lack of sleep in workers may lead to poor health conditions such as hepatic dysfunction. Melatonin is a hormone secreted by the pineal gland to alleviate insomnia. Moreover, it is a powerful antioxidant and may prevent acute liver injury. Therefore, workers take in melatonin to deal with sleep-related health is an important issue. The aim of this study was to investigate the effect of melatonin on an acute hepatic injury model sinusoidal obstruction syndrome (SOS) in mice. Male C57BL/6 mice were injected with a single dose (500 mg/kg) of monocrotaline (MCT) to induce SOS. Melatonin (1, 3, 10 and 30 mg/kg) was injected 1 h before MCT treatment. After 24 h of MCT treatment, mice were sacrificed. The blood and liver were collected. Organ damage was evaluated by serum biochemistry, hematology analyzer, and histological examination. Low doses of melatonin (1 and 3 mg/kg) had no protective effect on SOS. However, high doses (10 and 30 mg/kg) exacerbated SOS. In addition, it not only increased serum glutamate oxaloacetate transaminase (GOT), glutamate pyruvate transaminase (GPT) and extended liver damage indicated by histological examination but also decreased platelet levels, lymphocyte ratio, and glutathione level; it had no effect on malondialdehyde and nitric oxide level in SOS mice. To conclude, melatonin may exacerbate MCT-induced SOS in mice. Furthermore, melatonin might have a synergistic action with SOS. Usage of melatonin for insomnia by people working in long shift must be cautioned; it might cause acute hepatic injury.

**Keywords :** acute liver injury, melatonin, shift work, sleep deprivation

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