The survey effects of melatonin on the testicular toxicity induced by the citalopram in mice

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Introduction

Citalopram is the most potent selective serotonin reuptake inhibitor, commonly prescribed as an antidepressant, which can cause sexual dysfunction. Melatonin is a natural, highly effective antioxidant playing a pivotal role in the male reproductive system. The present study aimed to explore the ameliorating potential of melatonin on citalopram-evoked testicular toxicity and injury in mice.

Methods

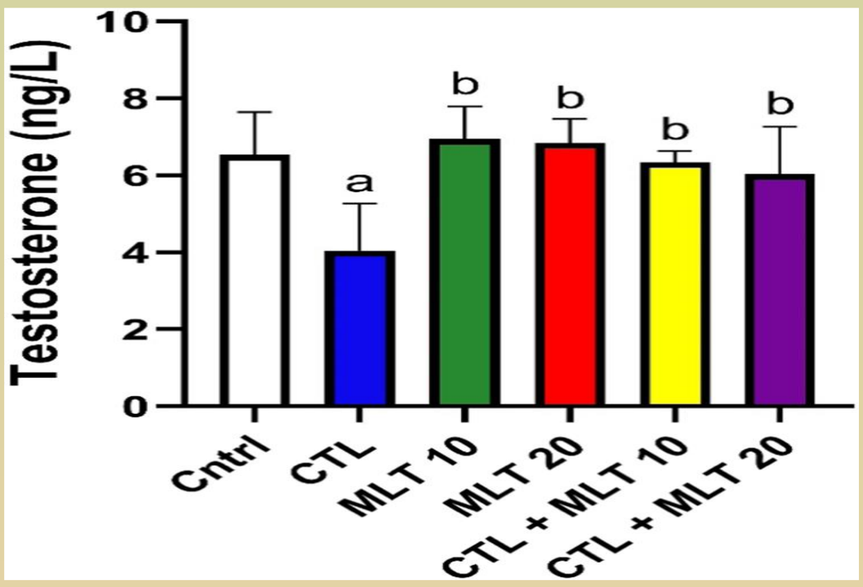
In this regard, mice were randomly divided into six groups: control, citalopram, melatonin 10 mg/kg, melatonin 20 mg/kg, melatonin 10 mg/kg plus citalopram, and melatonin 20 mg/kg plus citalopram. Adult male mice were intraperitoneally (i.p.) injected with 10 mg/kg of citalopram for 35 days with or without melatonin. At the end of the study, sperm parameters, testosterone level, testicular levels of malondialdehyde (MDA), nitric oxide (NO), total antioxidant capacity (TAC), and apoptosis (Tunel essay) were evaluated.

Results

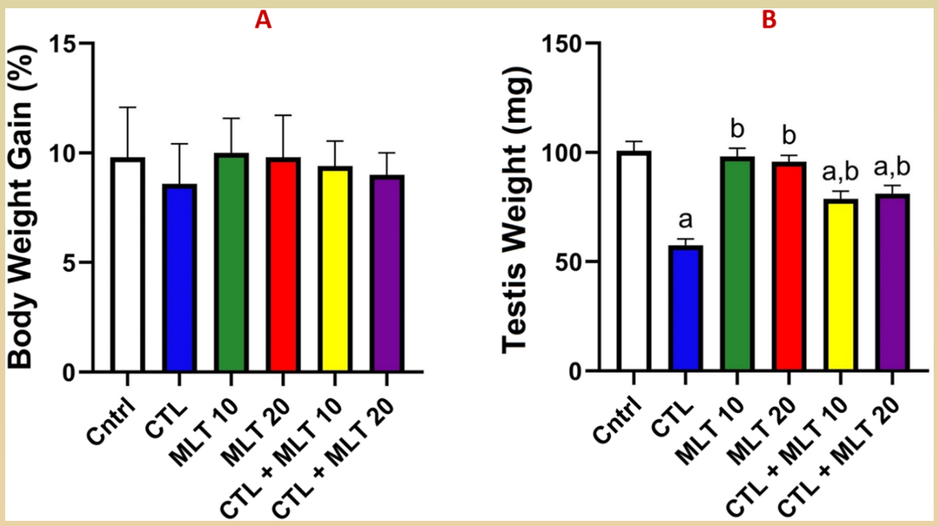
Our findings revealed that melatonin restored spermatogenesis by improving sperm count, motility, viability, morphology, and chromatin integrity. Testosterone levels and the histopathology of the testes were markedly improved in the melatonin-administrated groups. Furthermore, citalopram administration significantly increased oxidative stress; however, melatonin restored antioxidant status by enhancing TAC levels and decreasing NO and MAD levels. More notably, citalopram therapy induced a significant increase in the number of Tunel-positive cells, while melatonin administration significantly mitigated the apoptotic impacts of citalopram.

Conclusions

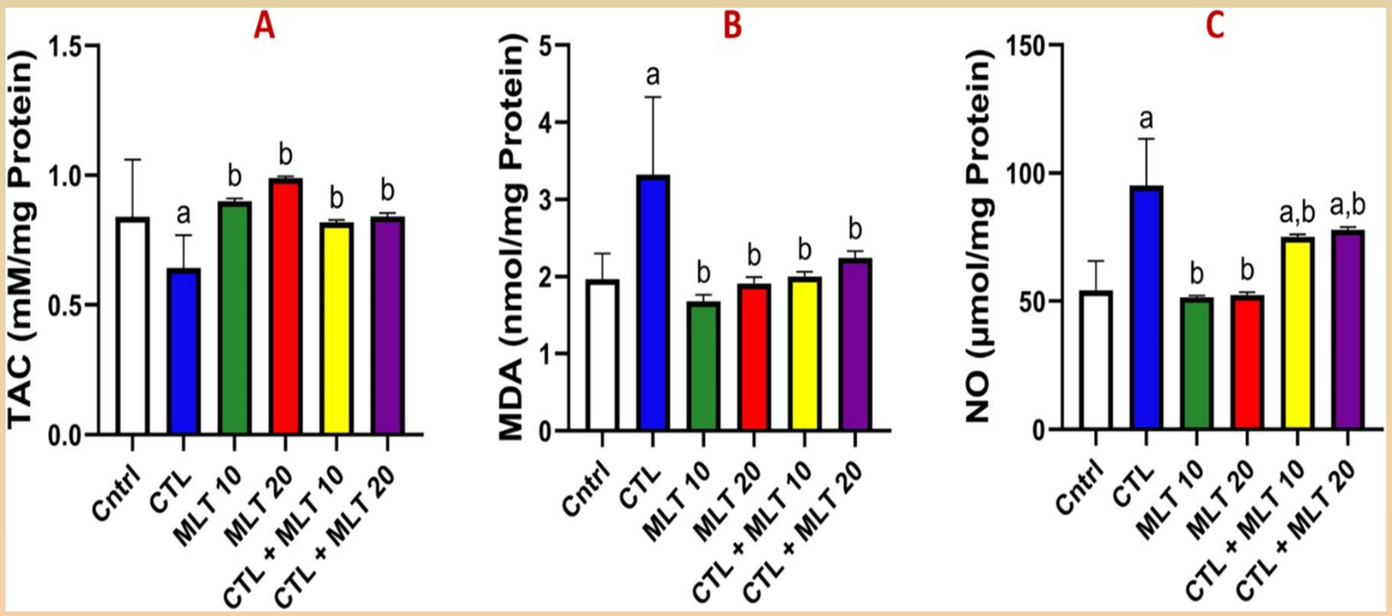
Together, melatonin therapy provides protection against citalopram-induced testicular damage via modulating nitro-oxidative stress and apoptosis, which provides evidence for melatonin as a promising treatment against antidepressant drug-associated reproductive toxicity and male sub/ infertility.



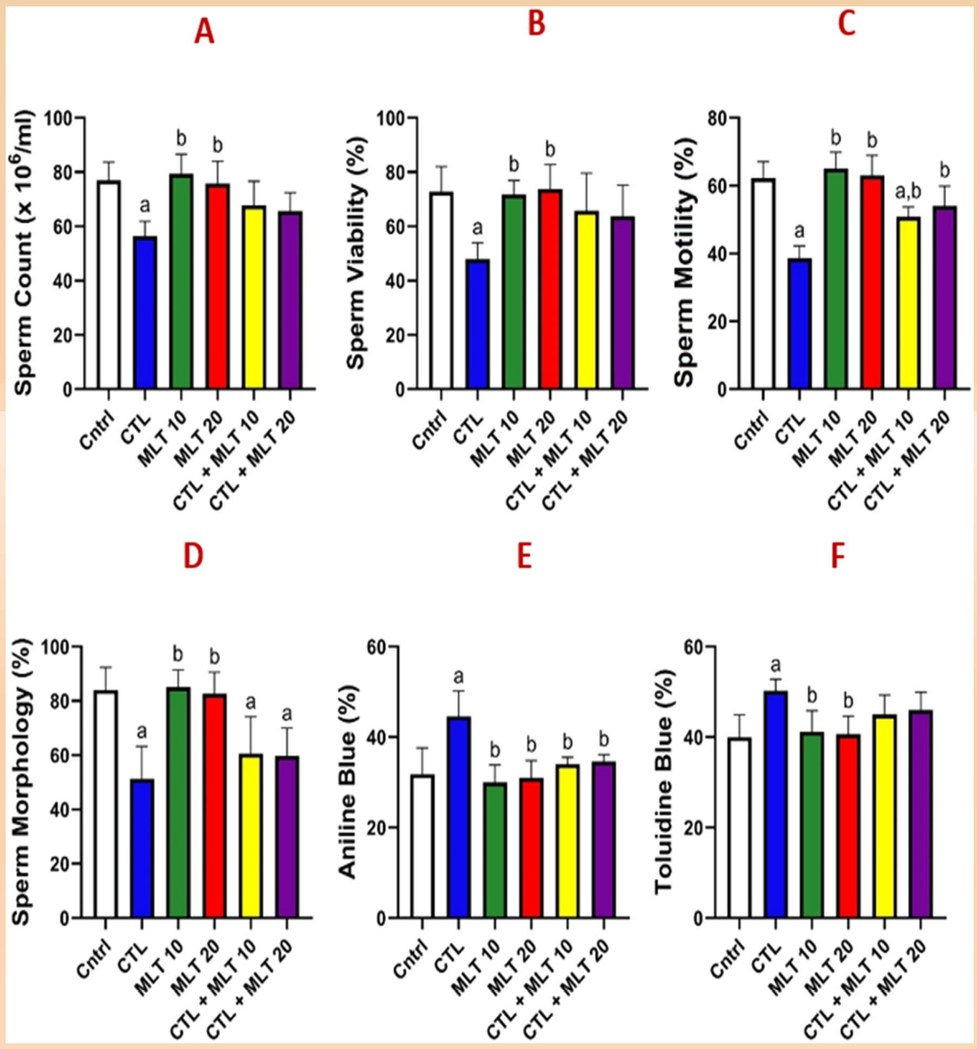
The effect of citalopram with or without melatonin on testosterone



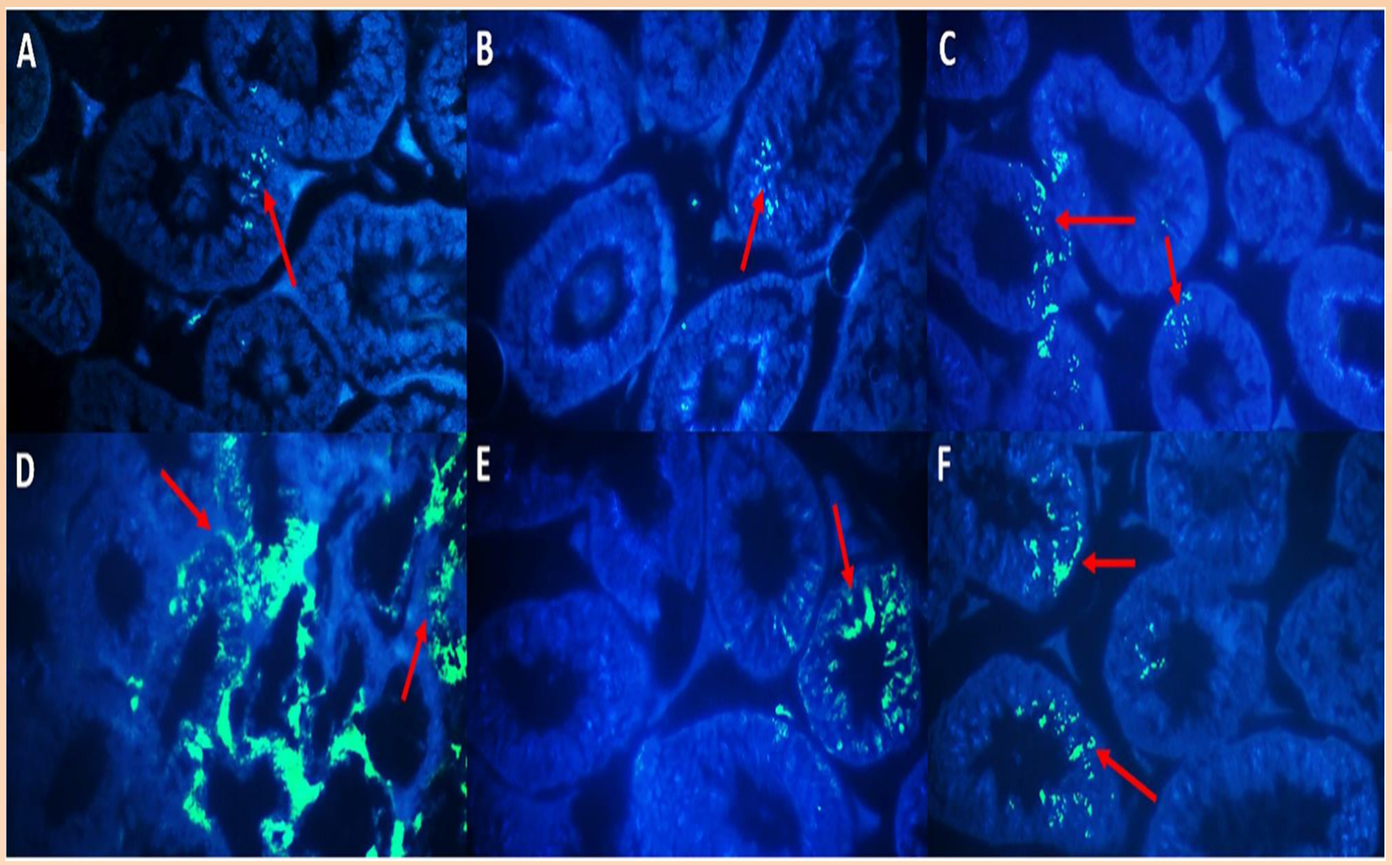
The effect of citalopram with or without melatonin on (A) body weight gain (%) and (B) testis weight (mg)



The effect of citalopram with or without melatonin on (A) TAC (total antioxidant capacity), (B) MDA (malondialdehyde), and (C) NO (nitric oxide)



The effect of citalopram with or without melatonin on sperm parameters



The effect of citalopram with and without melatonin on the expression of Tunel-positive cells in the testis