Survey the effect of Vitamin C on testicular toxicity induced by citalopram in mice

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Introduction

There is a growing concern that antidepressant drugs impair sexual function and adversely impact spermatogenesis and male fertility. Vitamin C is a natural antioxidant that plays a vital role in the male reproductive system. The present study investigated the ameliorating potential of vitamin C against citalopram (CTL)-evoked testicular toxicity and spermatogenesis impairment in mice.

Methods

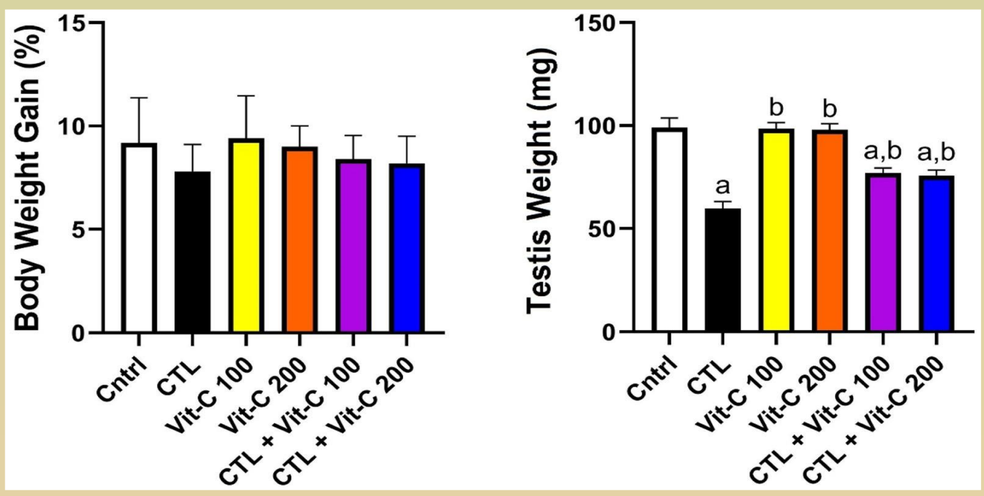
Mice were randomly divided into six groups: control, CTL, vitamin C 100, vitamin C 200, CTL plus vitamin C 100, and CTL plus vitamin C 200. Adult male mice were intraperitoneally (ip) injected with 10 mg/kg of CTL for 35 days with or without vitamin C. At the end of the study, body and testes weight, sperm parameters, histopathology of testes, testosterone level, testicular levels of malondialdehyde (MDA), nitric oxide (NO), total antioxidant capacity (TAC), and apoptosis (TUNEL assay) were evaluated.

Results

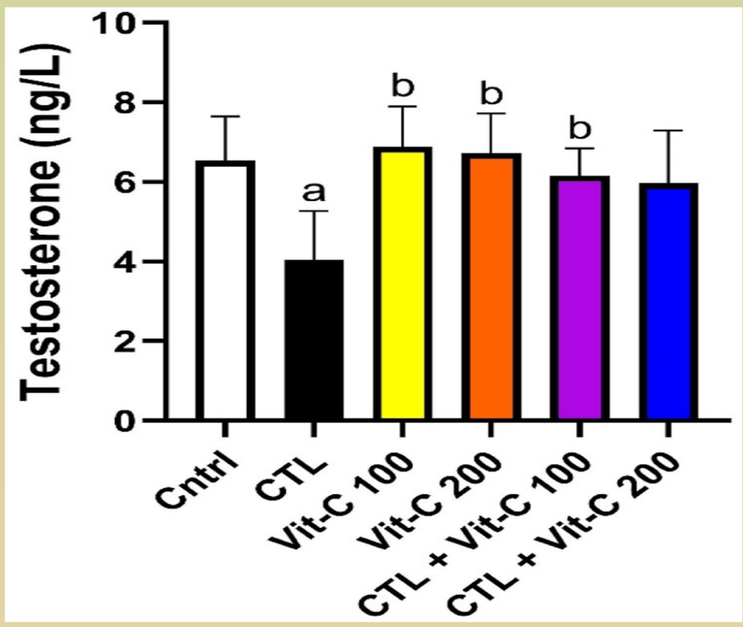
Our findings revealed that vitamin C restored spermatogenesis by improving sperm count, motility, viability, morphology, and chromatin integrity. Testosterone levels and testes histopathology were significantly improved in the vitamin C-administrated groups. Furthermore, vitamin C administration markedly alleviated CTL-induced nitro-oxidative damage, enhancing TAC levels, and reducing NO and MDA levels. Whilst CTL therapy induced a significant increase in the number of TUNEL-positive cells compared to the control, the administration of vitamin C significantly prevented the apoptotic effects of CTL.

Conclusions

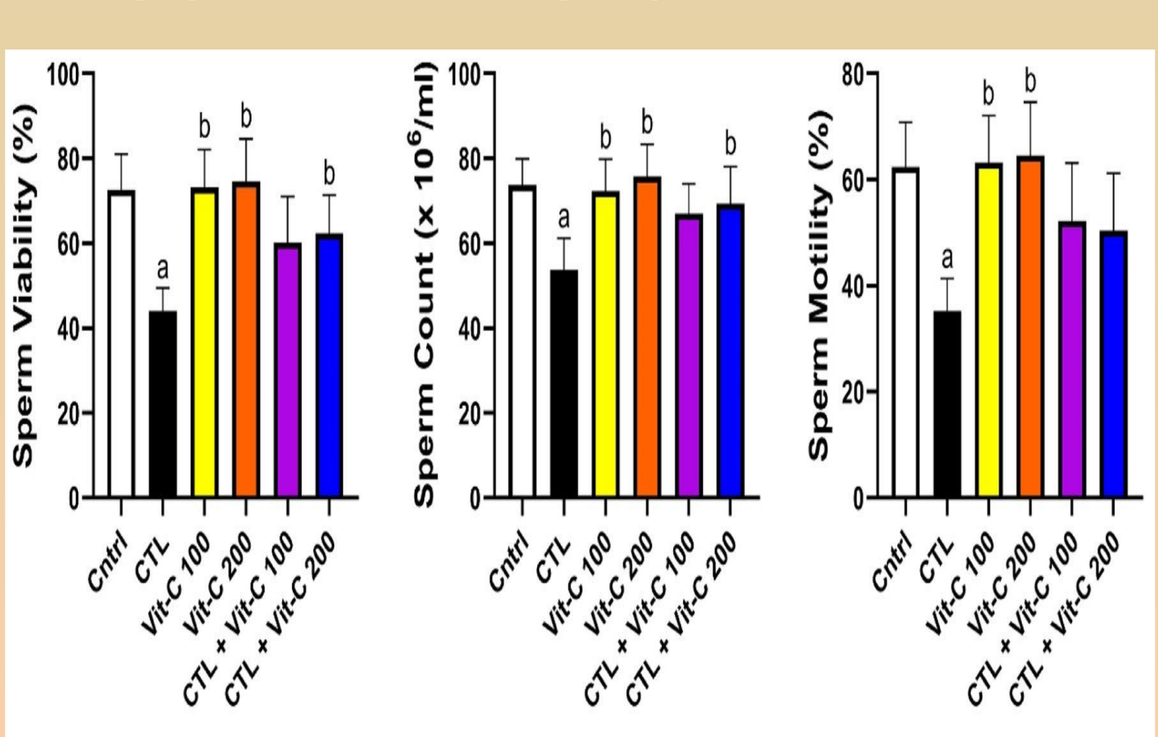
Together, vitamin C therapy protects against CTL-induced testicular damage via mitigating nitro-oxidative stress and apoptosis, which provides evidence for vitamin C as a beneficial therapy against antidepressant drug-associated reproductive toxicity and male sub/infertility.

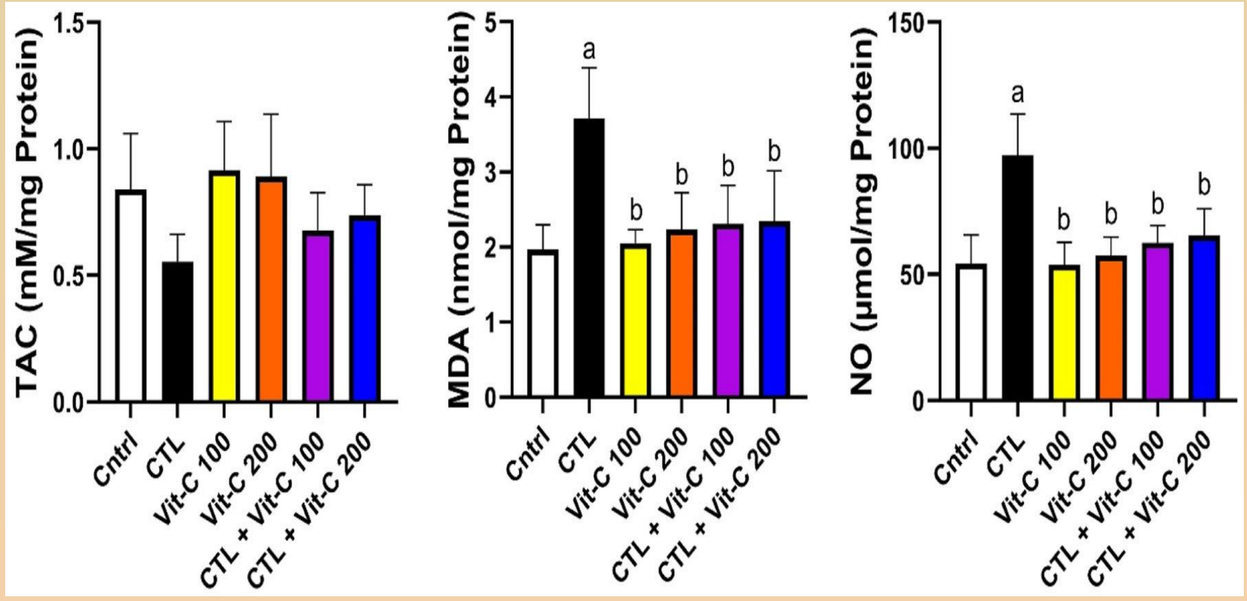


The effect of citalopram with or without vitamin C on (A) body weight gain (%) and (B) testis weight (mg)

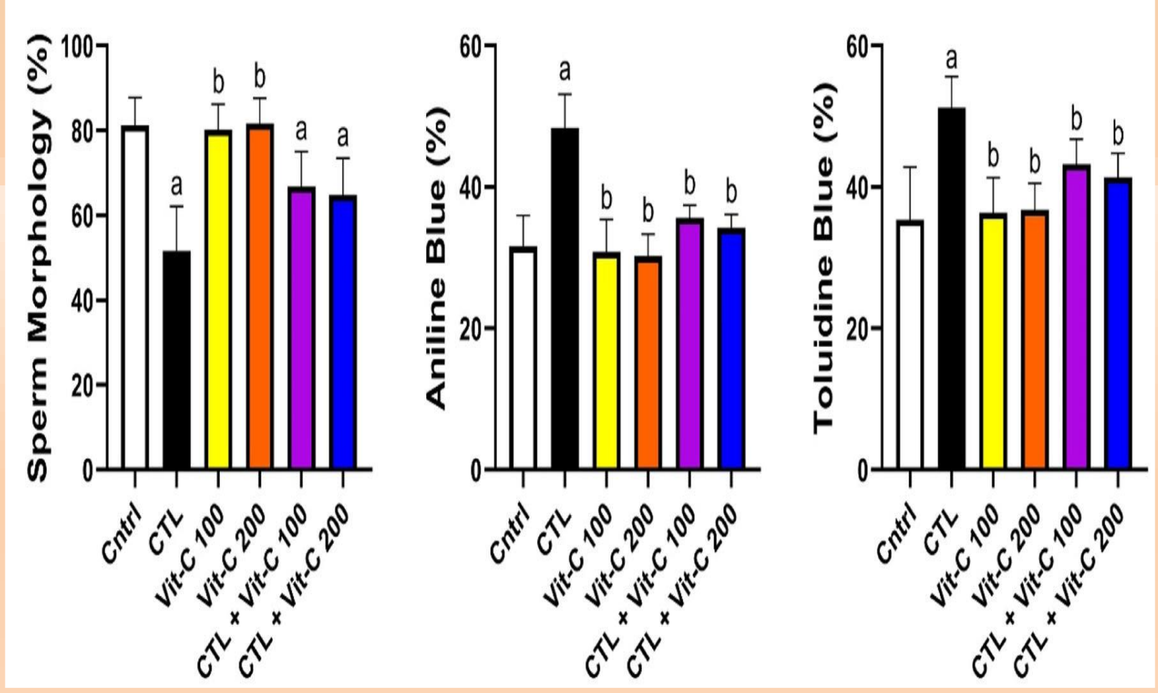


The effect of citalopram with or without vitamin C on testosterone

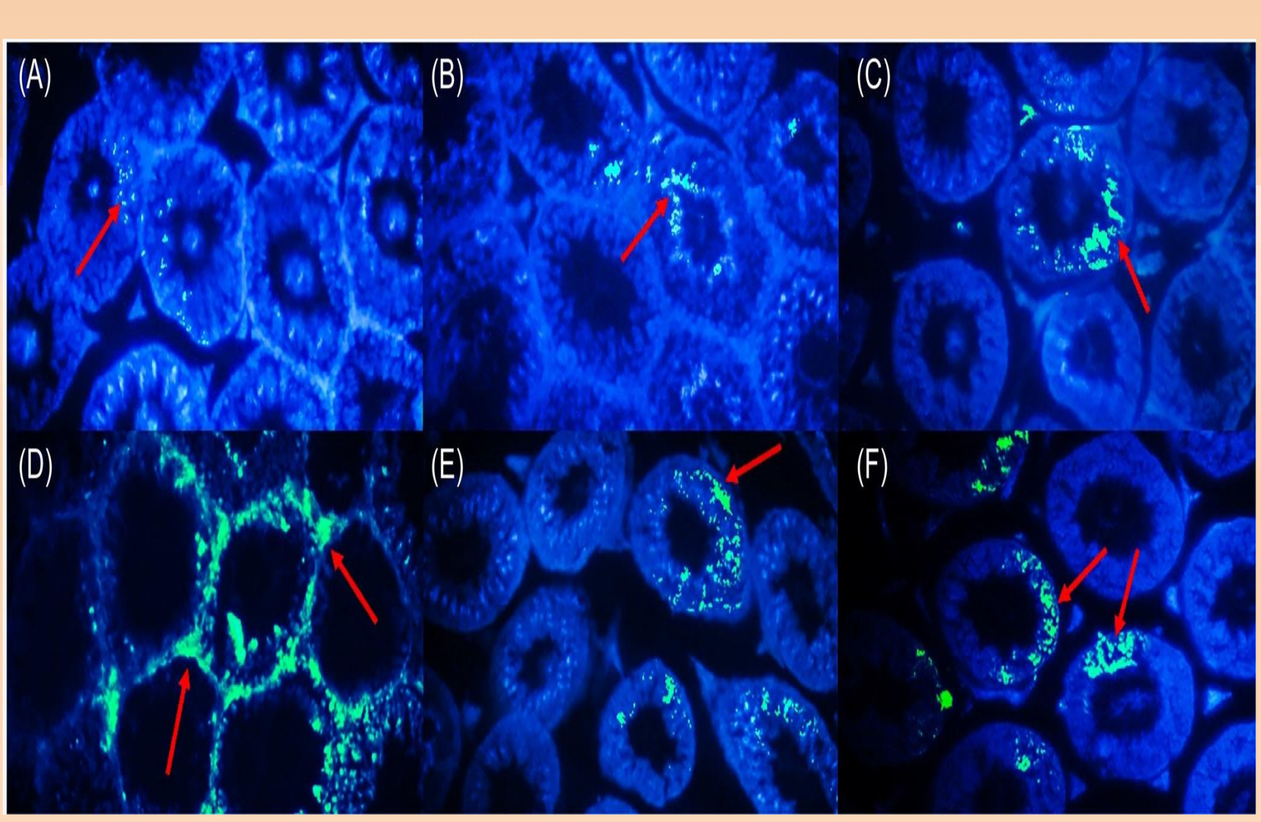




The effect of citalopram with or without vitamin C on (A) TAC (total antioxidant capacity), (B) MDA (malondialdehyde), and (C) NO (nitric oxide)



The effect of citalopram with or without vitamin C on sperm parameters



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