

## Exploring the effect of vitamin C on sleep deprivation induced memory impairment.

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**Abstract:** In the current study, the possible beneficial effect of vitamin C (VitC) against sleep deprivation induced memory impairment was examined. Chronic sleep deprivation was induced via placing rats in a modified multiple platform apparatus for 8h/day for a period of 6 weeks. Concomitantly, VitC was administered to animals at doses of 150 and 500 mg/kg/day. After 6 weeks of treatment, the radial arm water maze (RAWM) was used to test for spatial learning and memory performance. Moreover, the hippocampus was dissected; and levels/activities of antioxidant defense biomarkers glutathione reduced (GSH), glutathione oxidized (GSSG), GSH/GSSG ratio, catalase, superoxide dismutase (SOD), and thiobarbituric acid reactive substances (TBARS), were evaluated. Results revealed that chronic sleep deprivation impaired short- and long-term memories ( $P<0.05$ ). This impairment was prevented by chronic VitC treatments. In addition, VitC normalized sleep deprivation induced decreases in hippocampal GSH/GSSG ratio ( $P<0.05$ ), and activities of catalase, and SOD, and increase in GSSG levels ( $P<0.05$ ). Collectively, spatial memory impairment was induced by chronic sleep deprivation, and VitC treatment prevented such impairment. This was possibly achieved via normalizing antioxidant defense mechanisms of the hippocampus.