Attenuation of stress-induced behavioral deficits by lithium administration *via* serotonin metabolism

Tahira Perveen¹, Saida Haider¹, Wajeeha Mumtaz¹, Faiza Razi¹, Saiqa Tabassum¹, Darakhshan J. Haleem²

¹Department of Biochemistry, Neurochemistry and Biochemical Neuropsychology Research Unit, University of Karachi, Karachi-75270, Pakistan
²Neuroscience Research Lab, Dr. Paniwari Center for Molecular Medicine and Drug Research, University of Karachi, Karachi, Pakistan

**Correspondence:** Tahira Perveen, e-mail: tahiraat14@hotmail.com

---

**Abstract:**

**Background:** Although the mood stabilizing role of lithium is well established and the cognitive effects of lithium are also best demonstrated, but its primary effect on neurochemical profile and behaviors under stress remain ambiguous. Earlier studies have suggested that a single exposure to 2 h immobilization stress alters memory in various memory tasks, decreases exploratory activity in open field test and increases serotonin metabolism. This study is designed to investigate the stress relieving effect of lithium in rats.

**Methods:** Rats were orally administered with lithium carbonate (1 mg/kg/ml) while controls received an equal volume of water for 21 days. After 21 days, each group of rats was sub-divided into stressed and unstressed groups. Animals of stressed group received immobilization stress for 2 h and 24 h following stress behavioral analysis was performed, after which animals were decapitated and their brain samples were collected for neurochemical estimation by HPLC-EC.

**Results:** Results of the present study show that 2 h immobilization stress decreases locomotor activity while impairs memory performance. Prior administration of lithium attenuates memory impairment and locomotion suppressant effects of stress by reversing the stress induced brain serotonin metabolism in lithium treated rats.

**Conclusion:** Thus, the results of this study suggest that lithium may recover behavioral and neurochemical impairments induced by stress.

**Key words:**

stress, lithium, 5-HT, behavior