L-Arginine as a Protective Adjuvant in the Treatment of Bipolar Disorders with Hepatotoxic Agent Lithium

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{Original Article (Anatomy)}
Objective: The purpose of this randomized experimental study was to explore the beneficial effects of L-arginine on lithium carbonate induced liver toxicity.

Study Design: This study is randomized, interventional, prospective and experimental in nature.

Place and Duration of Study: This study was conducted in the department of anatomy, Basic medical sciences institute, Jinnah post graduate medical centre, Karachi. Animals were obtained from the animal house of BMSI, JPMC, Karachi. The duration of this study comprises of two to twelve weeks.

Materials and Methods: Sixty albino adult rats of 90 – 120 days of age weighing about 200 – 300 grams were used for this study. These were divided into four major groups A, B, C & D each comprising 15 rats. Each major group was sub-divided into three sub-groups 1, 2 & 3 on the basis of 02 weeks, 6 weeks and 12 weeks duration of treatment respectively. 4 um thick sections of rat liver were cut using rotary microtome for H&E. The statistical significance of the differences of various quantitative changes between lithium carbonate and lithium carbonate + L-arginine treated rats from the control rats were evaluated by the student T-test.

Results: Lithium treated group exhibited significant augmentation in absolute and relative liver
weight. Histopathological findings of liver revealed dilatation of central and portal veins, congestion of sinusoids, increment in mononuclear cell infiltration, microvesicular fatty change, swelling and hydropic degeneration of hepatocytes leading to pyknosis of nuclei, disintegration of organelles consequently leading to cell apoptosis and necrosis. Rats fed on co-administration of lithium plus L-arginine displayed significant improvement in the altered histology of liver lobules.

**Conclusion:** This study revealed that concomitant administration of L-arginine with lithium considerably reduces lithium’s adverse effects.

**Key Words:** L-arginine, lithium carbonate, rat liver, bipolar disorder, hepatotoxicity.

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