LETTERS TO THE EDITOR

Lithium and the kidney

Sujoy Ray, [1], MBBS, **Priya Sreedaran**, [2], MBBS, DNB
[1] *Junior Resident of Psychiatry,* [2] *Assistant Professor of Psychiatry, Department of Psychiatry, St. John's Medical College and Hospital, Bangalore, India*

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Dear editor

The use of lithium as a gold standard drug in the management of various psychiatric disorders is well established. However, it has various -adverse effects. [1] It merits therapeutic drug monitoring due to its narrow therapeutic index. [2, 3] One of the most important organs affected by lithium is the kidney. Lithium is a monovalent cation and competes with sodium at various channels like sodium-potassium 2 chloride pump (Na^+-K^+-$2Cl^-$ pump), sodium hydrogen pump (Na^+-H^+ pump) and the epithelial channel. It inhibits the antidiuretic hormone (ADH) by interfering with the insertion of aquaporin channels due to its action at the adenylate cyclase level. It also inhibits ADH secretion centrally. All of these prevent water re-absorption.

The most important outcome is acute renal failure which is characterized by the features of volume depletion namely, hypotension, tachycardia and feeble pulse. Other characteristic features are polyuria (defined as a 24 hour output of more than three litres), polydipsia (increased thirst and water intake) and nocturia. Chronic renal failure is however, rare. [4]Neuroleptic malignant syndrome for which use of lithium is a risk factor, can further serve as a cause of acute renal failure Various studies have monitored different aspects of renal function in patients on Lithium. Studies related to the glomerular filtration rate (GFR) show that lithium reduces GFR and GFR improves on discontinuing Lithium.[1,4, 5] Urinary concentrating capacity, as measured by reduced osmolarity of urine is worsened by Lithium though the volume of urine does not appear to change significantly.[1,6]

There is only one systematic review regarding the effects of lithium on kidneys (Database of abstracts of reviews of effects, DARE). [7] This review has incorporated indexed and non-indexed databases, journals, clinicians' data, textbook information and input from pharmaceutical companies and conference proceedings and includes various types of studies viz. randomized controlled trials, case-control, cohort and cross-sectional studies. The DARE's observations support the above evidence regarding GFR and urine concentrating ability. This review also reports that lithium induced end-stage renal disease is a rare event. It recommends the assessment of renal function at least every 12 months in patients on lithium. [7]

Overall, as far as the kidney is concerned, the effects of lithium are significant. Careful monitoring of renal functions viz. GFR, urinary concentration (as measured by urine osmolarity) and urine output can prevent serious consequences.[8] Considering the efficacy of lithium in treating various psychiatric disorders, one should not hesitate to use this drug.

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Address for correspondence: Dr. Sujoy Ray. Junior Resident, Department of Psychiatry, St. John's Medical College and Hospital, Bangalore-560008, Karnataka, India
Phone number: +919916821079

Email: raysujoy8@gmail.com

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