

## Lower Estimated Glomerular Filtration Rates in Patients On Long Term Lithium; a Comparative Study and a Meta-analysis of Literature

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Several studies have shown that long term lithium use is associated with a subtle decline in estimated glomerular filtration rate (eGFR). Lithium can be a risk factor for chronic kidney disease in long term users.

### Objective

To compare eGFR values of patients on long term lithium compared to controls matched for age, sex and confounding comorbidities

### Methods

Patients with bipolar affective disorder, who are on lithium (for at least a year), were compared against controls matched (1:1) for age, gender and presence or absence of diabetes and hypertension. The eGFR was calculated according to the modification of diet in renal disease study formula. A meta-analysis was performed to compare our findings with similar studies in literature.

### Results

Forty seven patients met the inclusion criteria. They were matched with 47 controls. The eGFR values of lithium users were significantly low ( $p = 0.04$ ) compared to controls and the mean decline in eGFR was  $-2.7$  ml/min/1.73m<sup>2</sup> (SD  $\pm 9.8$ ) per year. The significant difference in eGFR persisted between the subgroup without comorbidities (diabetes and hypertension) and their controls but disappeared for subgroup with comorbidities and their controls. Nevertheless, lithium users had a lower eGFR in both subgroups. A meta-analysis of 9 studies showed a significant lowering in the glomerular filtration rate in lithium users compared to controls [mean difference  $-10.3$  ml/min (95% confidence interval:  $-15.13$  to  $-5.55$ ,  $p < 0.0001$ ).

### Conclusions

Lithium causes a subtle decline in glomerular filtration rate and renal functions need to be monitored in lithium using patients.