

Images in Nephrology
(Section Editor: G. H. Neild)

Cystic kidney disease in a patient with long-term lithium therapy

An Vanacker¹, Jo Van Dorpe² and Bart Maes¹

¹Department of Nephrology and ²Department of Pathology, Heilig Hartziekenhuis Roeselare-Menen, B-8800 Roeselare, Belgium

Keywords: cystic kidney disease; lithium

A 47-year-old man with a bipolar disorder, treated with lithium for 24 years, presented with progressive chronic kidney disease (serum creatinine level 2.0 mg/dL, corresponding to a creatinine clearance of 35 mL/min). Lithium levels were always within therapeutic range (between 0.8 and 1.1 mmol/L). He had a urine output of 4–6 L/day without proteinuria or sediment abnormalities. He had a familial history of renal failure: his grandmother died at 76 years of age in renal failure; his uncle died in 1995 on haemodialysis and his aunt is currently in chronic haemodialysis. A coronal T2-weighted magnetic resonance image (MRI) showed diffuse cortical and medullary microcysts (1–2 mm), symmetric in both kidneys (Figure 1). A renal biopsy (Figures 2 and 3) confirmed numerous small cortical cysts, lined by simple cuboidal epithelium and dilated tubuli, besides signs of chronic tubulo-interstitial nephropathy CTIN (characterized by tubular atrophy and advanced interstitial fibrosis, out of proportion to the extent of glomerular or vascular disease). Fifty percent of the glomeruli in the biopsy were globally sclerotic. The other glomeruli showed lesions of focal sclerotic glomerulosclerosis. Genetic analysis for mutations in the uromodulin gene [MCKD2 (medullary cystic kidney disease)] was negative, and MR imaging of the kidneys of his aunt showed no renal cysts.

The predominant form of chronic renal disease associated with lithium therapy is chronic tubulo-interstitial nephropathy CTIN. This is a well-known entity, characterized by tubular atrophy and interstitial fibrosis, out of proportion to the extent of glomerular or vascular disease. However, not yet widely known is the fact that lithium may also lead to distal tubular dilatation and formation of microcysts, originating from distal and collecting tubules. They are localized in both the cortex and medulla and do not exceed 1–2 mm in diameter. They can easily be detected by MR imaging [1,2]. Recent studies have shown that cysts are seen in 33–62.5% of the patients receiving lithium therapy [3].

Correspondence and offprint requests to: Bart Maes, Department of Nephrology, Heilig Hartziekenhuis Roeselare-Menen, Wilgenstraat 2, 8800 Roeselare, Belgium. E-mail: bmaes@hhr.be



Fig. 1. Coronal T2-weighted magnetic resonance image (MRI) showed diffuse cortical and medullary microcysts (1–2 mm), symmetric in both kidneys.

In conclusion, the diagnosis of CTIN should be suspected in all patients with progressive kidney disease taking chronic lithium and can easily be made by MRI and renal biopsy. If possible, lithium therapy should be discontinued in these patients, but a serum creatinine of >2.0 mg/dL is predictive for progression to ESRD, despite withdrawal.

Conflict of interest statement. None declared.

References

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Received for publication: 29.10.08

Accepted in revised form: 16.12.08



Fig. 2. Renal biopsy showed cortical cysts lined by cuboidal epithelium (arrowheads). The interstitium surrounding the cyst is fibrotic. A dilated tubulus is indicated by an arrow (Jones methenamine silver stain).

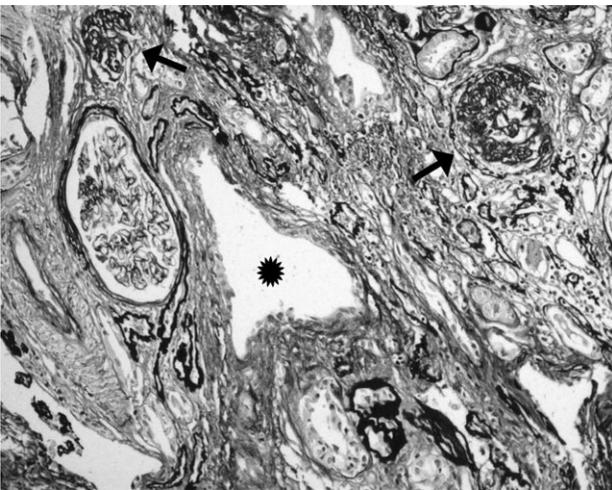


Fig. 3. The cortical architecture is severely distorted. There is advanced interstitial fibrosis and tubular atrophy. Two globally sclerotic glomeruli are indicated by arrows. A dilated tubulus is seen in the middle of the picture (asterisk) (Jones methenamine silver stain).