Lithium-induced cortical atrophy and cognitive dysfunction

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DESCRIPTION

A 50-year-old woman presented to the psychiatry clinic with symptoms of forgetfulness, distractibility and difficulty in absorbing information. She was started on lithium after a manic episode 10 years earlier and had been on lithium 900 mg/day for the past 10 years. During this period her mood had remained stable and she was euthymic. However, her occupational and social functioning was impaired significantly in the past year. She had no family history of bipolar disorder or dementia. No medical condition was detected as an explanation of her forgetfulness. Cranial MRI and quantitative electroencephalography (QEEG) were performed. Bilateral temporoparietal cortical atrophy and lateral ventricular asymmetry were detected in her MRI (figure 1). Increase in θ and δ frequency was detected in her QEEG without any paroxysmal activity (figure 2). Lithium was stopped, and 6 weeks after lithium withdrawal neuropsychological tests demonstrated significant improvement in the patient's cognitive functions. Mini Mental

State Examination scores increased from 25 to 30. The θ and δ waves disappeared and QEEG was normalised (figure 3).

Neuroprotective effects of lithium have been reported.¹ In these reports, the duration of lifetime exposure to lithium was not known. In the prospective studies lithium was used short term (several weeks).¹ Unlike these studies, impairment in cognitive function due to long-term use of lithium has been found.^{2,3} It is not known how chronic use of lithium makes changes in the brain and the hippocampus volume. Lithium has toxic effects on the thyroid gland and the kidney. Although it achieves a neuroprotective effect in a short time, it might also have a neurotoxic effect in the long run. In this case, cortical atrophy and cognitive dysfunction are thought to be due to long-term lithium use. In patients who use long-term lithium not only should their thyroid and the kidney functions be monitored but their cognitive functions and changes in their brain volume should also be checked.

Figure 1 MRI of the brain showing bilateral temporoparietal atrophy and lateral ventricular asymmetry.

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Montage: Unipolar

EEG ID: 761

Z Scored FFT Summary Information

Figure 2 Quantitative electroencephalography of the brain showing increase θ and δ frequency.

Montage: Unipolar

EEG ID: 931

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Figure 3 θ and δ waves disappeared and qEEG was normalised 6 weeks after lithium termination.

Learning points

- ▶ Long-term lithium use may cause cortical atrophy and cognitive dysfunctions.
- ▶ Patients who use lithium should be monitored with brain MRI.

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Competing interests None.

Patient consent Obtained.

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