CASPR2 Antibody-Associated Limbic Encephalitis Presenting with Hyponatremia, Radicular Pain and Urinary Retention: A Case Report

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Background

CASPR2 antibody-associated disease is a rare and heterogeneous clinical entity, which usually affects males over 50 years old. Most reports consist of limbic encephalitis, Morvan syndrome, epilepsy or pain syndromes[1], however the overall clinical spectrum is not fully understood yet. The antibodies involved are usually of the IgG4 subclass; they link CASPR2 protein, which is a transmembrane protein associated with voltage-gated potassium channels (VGKC), interfering with the synaptic transmission.[2,3]

Case report

Here we describe the case of a 49-year-old Pakistani patient who presented to the emergency department of our hospital with subacute onset of anterior bilateral thigh pain, followed by the development of bladder globe, behavioural changes, visual hallucinations and a generalized tonic-clonic seizure. Routine blood tests revealed **severe hyponatremia** (121 mmol/L), with **low plasma** and **urine osmolality** (266 and 109 mOsm/kg, respectively), but **normal urinary sodium excretion** (62 mmol/L). Microbiological investigations and immunological screening showed no significant findings.

His brain CT scan and **contrast-enhanced MRI** were unremarkable (*Fig. 1,2*), except for a degenerative-atrophic area in the left frontobasal region, likely representing the sequela of prior trauma. **EEG** reported non-specific occasional slow anomalies in the posterior temporal area (*Fig. 3*).

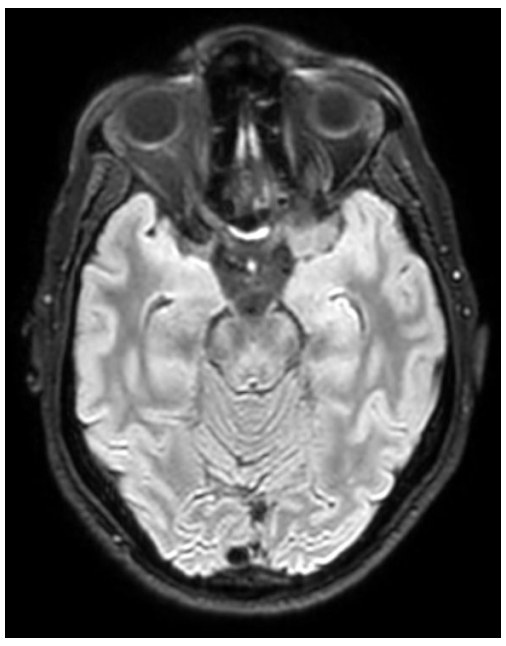

Fig. 1: *Brain MRI - axial*

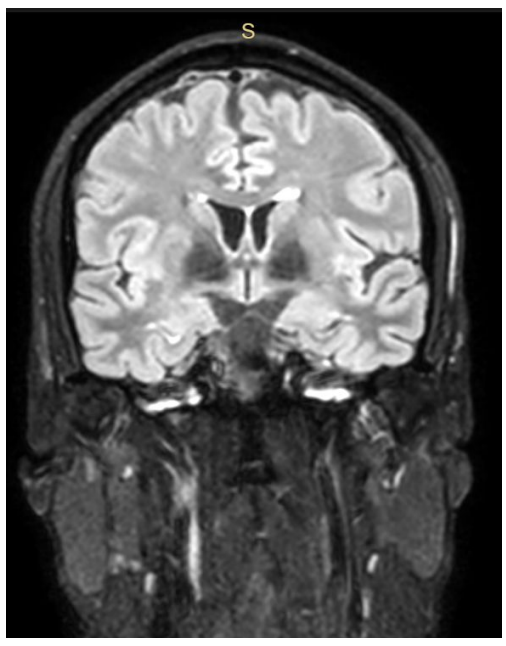

Fig. 2: *Brain MRI - coronal*

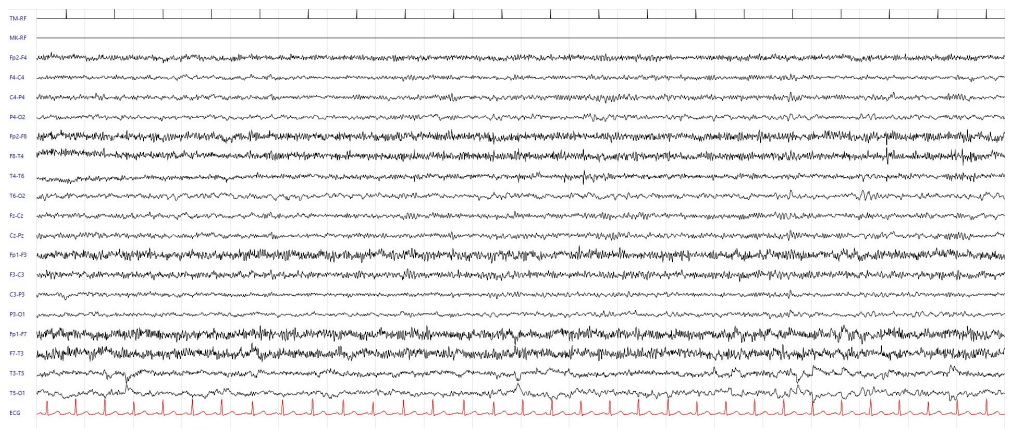

Fig. 3: *EEG*

Electromyography of lower limbs was normal. Given the suspicion of limbic encephalitis, a lumbar puncture was performed, revealing **slight hyperglycorrhachia** (4.1 mmol/L), **elevated protein levels** (0.5 g/L) and a normal cell count. **Anti-CASPR2 antibodies** were found positive in blood but not in cerebrospinal fluid. A total body CT scan ruled out a paraneoplastic aetiology. The patient was treated with methylprednisolone and a five-day course of intravenous immunoglobulin, with progressive clinical improvement and resolution of thigh pain and urinary disturbances. Hyponatremia was identified as a syndrome of inappropriate antidiuretic hormone secretion (**SIADH**) and was effectively treated with saline solution and vaptans. However, one week after discharge, the patient returned to our emergency department due to a recurrence of the electrolyte imbalance.

Discussion and conclusions

CASPR2 antibody-associated disease is a broad-spectrum disorder affecting multiple areas of the nervous system. Early recognition is crucial because immunotherapy and, when applicable, tumour treatment are often effective in this disease.[2] This case report exemplifies the clinical heterogeneity inherent to this condition, due to the coexistence of limbic encephalitis, radicular pain, dysautonomia and SIADH.

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