Ketogenic diet as additional and safe therapeutic tool in a very severe case of ADEM

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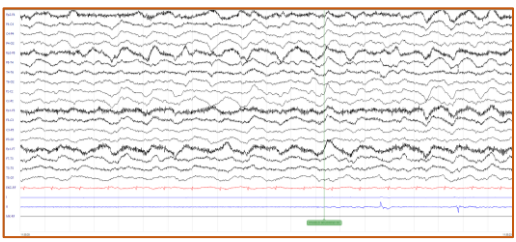
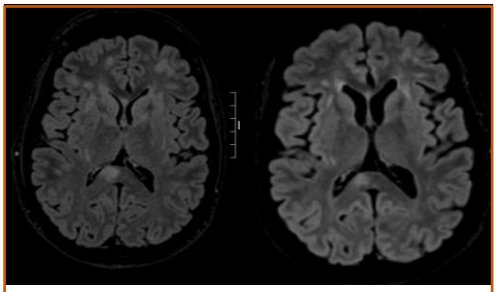
Introduction

Acute disseminated encephalomyelitis (ADEM) is an acute inflammatory demyelinating disorder of the central nervous system. This case report presents an adult female patient diagnosed with ADEM which rapidly progressed to a comatose state and was treated with a ketogenic diet in addition to traditional therapies in an escalation strathegy.

Case Presentation

A 47-year-old woman, with no prior medical history, was admitted to the emergency department due to psychomotor slowing, confusion and vomiting. The day before admission, she developed fever accompanied by headache and photophobia. The neurological examination revealed meningism signs. An initial diagnostic work-up for infectious meningoencephalitis was performed, with CSF and serum tests which resulted unmarkable and an empiric antibiotic therapy was started. The patient was transferred to the intensive care unit within due to progressive clinical deterioration developing an EEG pattern of delta coma with delta crowns. Brain magnetic resonance imaging (MRI) revealed numerous T2/FLAIR iperhyntense lesions involving supratentorial subcortical white matter, brainstem, cerebellum and spinal cord with contrast enhancement. Search for anti-AQP4 and anti-MOG antibodies resulted negative.





Brain RM on acute phase and at 3 months after

High-dose steroid therapy showed no clinical improvement so the patient underwent five sessions of plasma exchange therapy. A ketogenic diet (4:1 ratio) was also initiated as a complementary intervention. Subsequently, a rapid clinical improvement was observed which led to transfer to the neurology ward. Upon ICU discharge, the patient exhibited severe tetraparesis and significant impairments in comprehension and language. The patient was then transferred to a rehabilitation facility. The ketogenic diet was maintained for three months post-event. MRI at three months showed a significant reduction in the number and size of the lesions. The patient continued both physical and cognitive rehabilitation, achieving substantial recovery of global functioning and autonomies after two years.

Discussion

Based on the available literature, we initiated a ketogenic dietary regimen in our patient on an ex adjuvantibus basis.
The ketogenic diet is a well-established therapeutic approach in neurology, particularly in epilepsy, and its application in broader neurological contexts has been growing.
The role of ketone bodies in modulating neuroinflammation has become an area of increasing interest, showing efficacy in inflammation-driven refractory status epilepticus.

Conclusions

The ketogenic diet may represent a safe and well tollerated supportive adjunct to conventional treatment in patients with acute neuroinflammation pathologies, such as ADEM, though its potential to improve prognosis warrants further investigation through dedicated studies.

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