



## Case Report

## Use of perampanel in one case of super-refractory hypoxic myoclonic status: Case report



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## ABSTRACT

Proper treatment of hypoxic myoclonic status is not clearly determined. Induced hypothermia is improving prognosis and a more aggressive treatment might be beneficial in some patients. Among the new options of antiepileptic drugs, perampanel (PER) is a drug with a novel mechanism, and it might be a promising drug for myoclonic status or as an antimyoclonic drug. We describe the use of PER in one patient with hypoxic super-refractory myoclonic status.

**Description:** A 51-year-old patient presented after an out-of-hospital cardiac arrest due to an acute myocardial infarction. The patient was diagnosed with clinical and electrical (EEG) myoclonic status at the rewarming phase. Several treatments were used, starting with clonazepam, valproate, sedation (midazolam, propofol), and subsequently barbiturate-induced coma with persistent myoclonic status. Finally, we decided to try PER (dose: 6–8 mg) through a nasogastric tube, resulting in a marked improvement of EEG activity and myoclonus decrease. The patient had a progressive clinical improvement, with a CPC (Cerebral Performance Category) scale score of 1. **Conclusion:** This case shows the potential utility of PER as a therapeutic option in super-refractory hypoxic status and even its potential use before other aggressive alternatives considering their greater morbidity.

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## 1. Introduction

The intensity of treatment of postanoxic myoclonic status is not clearly established; it can be considered that myoclonic status is only a marker of the severity of the initial damage and therefore its treatment does not improve the prognosis; however, other authors point out that status epilepticus (SE) acts actively to increase brain injury and worsen prognosis, so its aggressive treatment could improve prognosis [1].

The introduction of therapeutic hypothermia is improving the prognosis of these patients, and there is an increasing number of new studies and reassessment of concepts in hypoxic encephalopathy. Aggressive treatment could be justified in some patients since they may awaken if their seizures are treated adequately. Treatment in these cases is usually initiated in a similar way to any SE but with particularities: clonazepam, valproate, levetiracetam, or piracetam is preferable to other antiepileptic drugs (AEDs) (especially phenytoin) due to their antimyoclonic action, and, if necessary, the comatose state should be

induced pharmacologically, controlling the depth of coma by EEG until epileptiform activity is eliminated.

In many centers, the treatment of postanoxic myoclonic status includes all these options (levetiracetam, valproate, midazolam, and propofol) for a minimum of 24 h, and then between 24 and 72 h, the treatment is reassessed according to the patient's condition based on brainstem reflexes and/or cortical response (N20 wave) to somatosensory-evoked potentials.

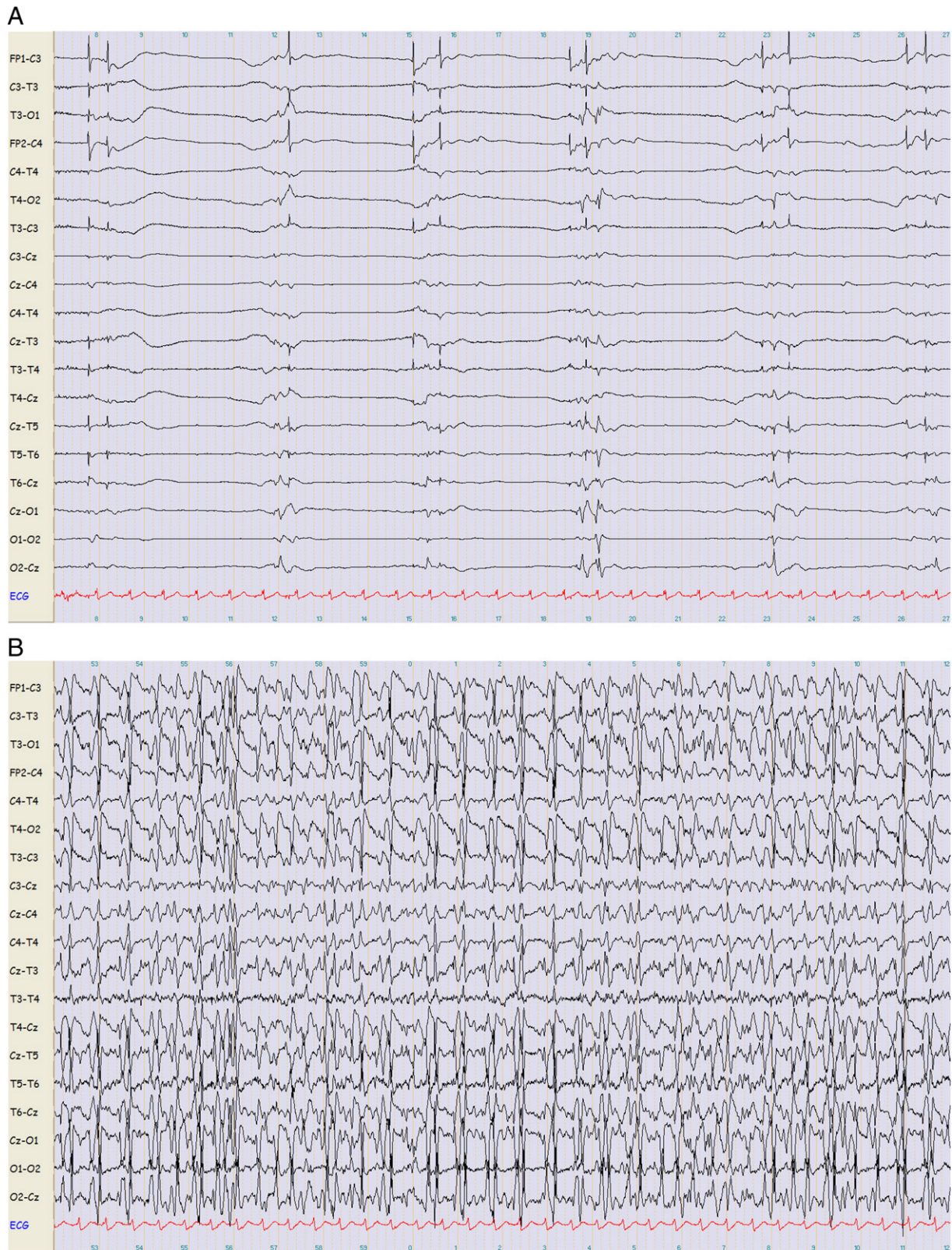
Among the new options in AEDs, perampanel (PER) constitutes a drug with a novel mechanism of action that makes it attractive for use in situations of SE. We report the first case, to our knowledge, of a patient with postanoxic myoclonic status super-refractory to all antiepileptic drugs and sedatives used, in whom the efficacy of PER was tested.

## 2. Case report

A 51-year-old male patient presented after an out-of-hospital cardiorespiratory arrest in the context of an anterolateral acute myocardial infarction (AMI) — Killip class II. The patient's history included only active smoking without other cardiovascular risk factors. Cardiopulmonary resuscitation (CPR) maneuvers were performed for 15 min

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**Fig. 1.** EEG evolution before PER. (a) 12 h post-CPR. Hypothermia (33 °C). Sedation with midazolam and morphine chloride. Burst-suppression pattern. Pectoral and laterocervical myoclonia. (b) 72 h post-CPR. Sedation. AEDs: CZP, VPA. Spiky bilateral periodic discharges. Bipolar montage (sensitivity: 15 µV/mm; speed: 20 s). CPR: cardiopulmonary resuscitation. AED: antiepileptic drug. CZP: clonazepam. VPA: valproic acid.

until resumption of spontaneous circulation (ROSC). On arrival to the hospital, the hypothermia protocol was initiated to target a body temperature of 33 °C. A coronary arteriography was subsequently performed with revascularization of the occluded vessel.

Twelve hours after CPR (still in the hypothermia phase), the patient was observed to have early myoclonic SE with a burst-suppression EEG pattern (Fig. 1a). Despite the introduction of clonazepam and valproic acid (40 mg/kg), electroclinical worsening was observed in the

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