Short-term outcomes and major barriers in the management of convulsive status epilepticus in children: a study in Georgia

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Introduction

• Convulsive status epilepticus is the most common childhood neurological emergency in developing countries

• Lack of specialized protocols for emergency services is a main hallmark of pre-hospital management of CSE

• Restricted availability of intravenous second-line antiepileptic drugs (AEDs) is a hindering factor in Georgia

• Buccal midazolam, rectal diazepam, and lorazepam are not registered in Georgia
Study aims and methods

• Aims
  • Evaluation of the epidemiological features of convulsive status epilepticus in paediatric patients.
  • Identification of obstacles influencing the management of patients with convulsive status epilepticus in Georgia.

• Methods
  • A prospective, hospital-based study was performed.
  • Paediatric patients with CSE, admitted to the emergency department of a referral academic hospital from 2007 to 2012 and treated according to an adapted protocol, were studied.
Adapted treatment protocol of CSE

Shatirishvili et al., 2015
Results

- Case fatality rate (CFR) was 8%
- Recurrent CSE manifested in 23% patients
- 44% individuals had a previous diagnosis of epilepsy
- Neurological deterioration after CSE developed in 17% patients
- The nature of the new neurological consequences in the entire cohort were as follows:
  - Diffuse persistent hypotonia
  - Hemiparesis
  - Cranial nerve palsy
  - Cognitive impairment
  - Loss of previously reached developmental milestones

Shatirishvili et al., 2015
Results

• The minimal time from seizure onset to BZD administration at pre-hospital setting was five minutes.

• The seizure duration in the timely intervention group was significantly shorter compared to those with delayed intervention (Fig. 1).

Figure 1. Seizure duration and pre-hospital treatment adequacy

Shatirishvili et al., 2015
Results

- 65% patients received “appropriate” pre-hospital treatment
- The seizure duration in these cases was significantly shorter, compared with the “inappropriate” group (Fig. 2)
# Etiology of CSE

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute symptomatic</strong></td>
<td></td>
</tr>
<tr>
<td>Viral encephalitis</td>
<td>3</td>
</tr>
<tr>
<td>Bacterial meningitis</td>
<td>1</td>
</tr>
<tr>
<td>Tuberculous meningitis</td>
<td>1</td>
</tr>
<tr>
<td>Haemorrhagic stroke after rupture of arteriovenous malformation</td>
<td>1</td>
</tr>
<tr>
<td>Sinus thrombosis</td>
<td>1</td>
</tr>
<tr>
<td>Ischaemic stroke</td>
<td>1</td>
</tr>
<tr>
<td>Posterior reversible encephalopathy</td>
<td>1</td>
</tr>
<tr>
<td>AED withdrawal</td>
<td>1</td>
</tr>
<tr>
<td>Aspiration syndrome</td>
<td>1</td>
</tr>
<tr>
<td><strong>Febrile CSE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Idiopathic/cryptogenic CSE</strong></td>
<td>16 (33)</td>
</tr>
<tr>
<td><strong>Progressive encephalopathies</strong></td>
<td></td>
</tr>
<tr>
<td>Dravet syndrome</td>
<td>2</td>
</tr>
<tr>
<td>Migrating partial epilepsy of infancy</td>
<td>1</td>
</tr>
<tr>
<td>Congenital disorder of glycosylation CDG type 1</td>
<td>1</td>
</tr>
<tr>
<td>Urea cycle disorder</td>
<td>1</td>
</tr>
<tr>
<td><strong>Remote symptomatic</strong></td>
<td>6 (13)</td>
</tr>
</tbody>
</table>

Shatirishvili et al., 2015
Conclusions

• Acute symptomatic aetiology was the second most frequent cause, with predominating infection of the central nervous.

• Delayed pre-hospital treatment intervention increases risk of seizure prolongation.

• Unavailability of injectable second-line AEDs leads to repeated use of BZDs and, as a result, to increased need for mechanical ventilation.

• Use of artificial ventilation is not associated with increased mortality.

Shatirishvili et al., 2015