YIELD OF LUMBAR PUNCTURE IN FIRST EPISODE OF COMPLEX FEBRILE SEIZURE

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ABSTRACT
One of the commonest seizures of childhood is febrile seizures. The presentation of these seizures is either simple or complex. Seizures in children aged 6 months to 6 years who previously were normal neurologically/developmentally fit to the diagnosis of febrile seizures. However, seizures remain a common presentation in children with neuro infections. A retrospective study of CSF pleocytosis in the cases with first episode of complex febrile seizures admitted to a tertiary care rural hospital although gave a low yield for ABM, the yield was significantly higher in children aged <1 year. Thus, it becomes imperative to evaluate children <1yr having the first episode of complex febrile seizures with lumbar puncture to rule out neuro infections.

Keywords: Complex Febrile Seizure, Acute Bacterial Meningitis, CSF Pleocytosis, Neuro Infections

INTRODUCTION
Need for Study
Febrile seizures are the most common form of childhood seizures, affecting 2% to 5% of all children and usually appearing between 6 months and 6 years of age. Febrile seizures occur in the absence of intracranial infection, metabolic disturbance, or history of a febrile seizures, and are classified as simple or complex.

A complex febrile seizure is more prolonged (>15 min), is focal, and/or reoccurs within 24 hr (American Academy of Pediatrics Steering Committee on Quality Improvement and Management, Subcommittee on Febrile Seizures 2008; Syndi Seinfeld and Pellock, 2013). Current treatment plans vary greatly among emergency centres, which focus more on isolation of the source of fever than detailing a thorough seizure work-up (Teng et al., 2006).

The possibility that a febrile seizure may be the sole presenting sign of acute bacterial meningitis (ABM) remains a major concern, more so in cases of complex febrile seizures. Few patients who experienced a febrile seizure had ABM in the absence of other signs or symptoms (Kimia et al., 2009).

This study helps to assess the rate of neuro infections (namely Acute Bacterial Meningitis) on the basis of CSF Pleocytosis, among children who present with first episode of complex febrile seizure and for early recognition of ABM in the absence of clinical symptoms and initiation of treatment.

Review of Literature
In a study by Kimia et al., (2009) few patients with febrile seizures have ABM in the absence of other signs or symptoms. LP should be performed on the basis of clinical suspicion and additional signs and symptoms that are suggestive of meningitis.

Study by Singh et al., (2014) study revealed 48.6% incidence of acute bacterial meningitis among children (6 months to 5 years) with a first episode of febrile convulsion who were subjected to lumbar puncture based on clinical suspicion. It was also found that high-grade fever, antibiotic use, the higher number of antibiotic doses; low haemoglobin and low blood sugar were found to be significant predictors of meningitis among children aged 6-60 months who presented with a first episode of febrile convulsion.

Study by Joshi et al., (2008) done on cases that presented with first episode of fever and seizure between six months to five years of age, showed that there were a total of 28 children in the 6-12 months age group, 31 in 12-18 months and 51 in above 18 months age, among which 16 (14.54%) children were diagnosed to have meningitis.
Chin et al., (2005) reported ABM in as many as 17% of children with febrile status epilepticus, defining convulsive status epilepticus as a seizure or series of seizures without recovery of consciousness between seizures and lasting at least 30 minutes. Study by Offringa et al., (1992) reported an increasing likelihood of bacterial meningitis with longer seizure duration. Study by Green et al., (1993) reported that a seizure did not occur as the only clinical indicator of meningitis in a large series of patients who had bacterial meningitis.

Objectives of Study
A) To assess the rate of CSF pleocytosis among children who present with their first complex febrile seizure.
B) To compare the rate of yield of lumbar puncture among children aged <1 year and children aged 1-6yrs

MATERIALS AND METHODS
Study Design: Hospital based retrospective study.
Source of Data
The study was conducted over a period of three years (Cases admitted from 01-08-2015 to 31-08-2017) with data of children aged 6 months to 6 years who had their first complex febrile seizure admitted to PICU of MVJ Medical College and Research Hospital.
Method of Collection of Data
Children aged 6 months to 6 years who had their first episode of complex febrile seizure satisfying the inclusion and exclusion criteria were included in the study. The details of these cases were collected from their case sheets at the Medical Records Department.
Inclusion Criteria
1. Children aged 6 months to 6 years.
2. First episode of complex febrile seizure.
3. Seizure semiology fitting the definition of complex febrile seizure.
Exclusion Criteria
3. An immunocompromised state.
4. An underlying illness (genetic, metabolic factors and possibly structural brain abnormalities) associated with seizures.
5. Cases of trauma leading to altered consciousness/seizures.
Definitions
Complex Febrile Seizures: A complex febrile seizure is more prolonged (>15 min), is focal, and/or reoccurs within 24 hr (Chin et al., 2005). CSF Pleocytosis, suggestive of neuro infections, was taken as neutrophil count of =/>1 cells/cumm and/or Lymphocyte count of >5 Cells/cumm.
Statistical Data Analysis
Data was entered systematically in Microsoft Excel. Tabulation and charts were generated using Microsoft Word and Microsoft Excel. Comparisons made using Chi-square test.
RESULTS AND DISCUSSION
Results
Children aged 6months to 6 years who presented to the emergency ward of our hospital with first episode of complex febrile seizures were short listed. Out of which 45 children who were further evaluated with lumbar puncture were eligible for study. Amongst these, 24 were males and 21 were females. Children aged <1yr were 13 in number while 32 children were aged between 1yr and 6yrs. (Graph: 1) (Table: 1)
CSF Results
In the 45 cases which were eligible, on further evaluation with lumbar puncture, 20.0% (9cases) of the cases showed CSF pleocytosis. On comparing ages <1 yr and 1-5 yrs, the yield of positive result in<1yr
was 46.15% (6 cases) and yield was 9.375% (3 cases) in ages 1-5 yrs with a p-value of 0.00518, thus, making higher yield of lumbar puncture in children <1yr of age, statistically significant.

Table 1

<table>
<thead>
<tr>
<th>Age</th>
<th>Cases</th>
<th>Positive</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1yr</td>
<td>13</td>
<td>6</td>
<td>46.15</td>
</tr>
<tr>
<td>1-6yrs</td>
<td>32</td>
<td>3</td>
<td>9.3750000</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>9</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Conclusion

Although the yield of lumbar puncture showing CSF pleocytosis in cases of complex febrile seizures is low, the yield becomes markedly higher in children aged less than 1 year, which is also statistically significant. Thus, it becomes important to evaluate with lumbar puncture in such children who present with first episode of complex febrile seizure. However, this study is limited by the small sample size.

REFERENCES


Chin RF, Neville BG and Scott RC (2005). Meningitis is a common cause of convulsive status epilepticus with fever. *Archives of Disease in Childhood* 90(1) 66–69.


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