Febrile convulsions and sudden infant death syndrome

M Vestergaard, O Basso, T B Henriksen, J Østergaard, J Olsen

It has been suggested that sudden infant death syndrome (SIDS) and febrile convulsions (FC) are related aetiologically. Both conditions may be age specific reactions to fever in susceptible children, and the common mechanism may be termolabile syncope with cerebral ischaemia. The hypothesis is supported by the observations that cats’ reactions to artificially induced fever depend on age; younger kittens tend to die suddenly, older kittens tend to have convulsions, and mature cats tend to remain intact. Both SIDS and FC occur in time based clusters, and children who die of SIDS are generally younger than children with FC. We found no support for the shared susceptibility hypothesis.

Subjects and Methods

We performed a follow up study based on information from two nationwide registries in Denmark. The National Hospital Register contains information on almost all discharges (99.4%) from Danish hospitals since 1977. Diagnostic information is classified according to a Danish version of the International Classification of Diseases; ICD8 was used from 1984 to 1993, and ICD10 from 1994 to 1998. We included children with FC if they had ICD8 code 795.21 or ICD10 code R95.9, were between 3 and 60 months old at the time of discharge, and had no recorded history of non-febrile convulsions, cerebral palsy, severe head traumas, intracranial tumours, meningitis, or encephalitis. The Fertility Database at Statistic Denmark links several population based registries in order to obtain data on family structure, social conditions of the family, pregnancy outcome, and causes of death. We linked information from the two registries by means of the personal identifier of the child.

RESULTS

We followed 30 054 infants for 29 844 person years, and identified 49 infants who died of SIDS, corresponding to an overall incidence rate of 1.64 per 1000 person years in the two cohorts. We found no evidence of an increased risk of SIDS in siblings who had been hospitalised with FC (HR: 0.90; 95% CI: 0.49 to 1.66). We found no evidence of a reduced risk of SIDS in siblings who had never been hospitalised with FC (HR: 1.00; 95% CI: 0.90 to 1.66).

Table I. Risk of SIDS in siblings of children who had had febrile convulsions (FC+) relative to the risk in siblings of children who had never been hospitalised with febrile convulsions (FC-) as measured by the Cox HR

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>Person years at risk</th>
<th>No.</th>
<th>No. per 1000</th>
<th>HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC−</td>
<td>20036.98</td>
<td>34</td>
<td>1.70</td>
<td>1.00*</td>
</tr>
<tr>
<td>FC+</td>
<td>9807.25</td>
<td>15</td>
<td>1.53</td>
<td>0.90 (0.49 to 1.66)</td>
</tr>
</tbody>
</table>

*Reference.

date of emigration, when the child reached 1 year of age, or 31 December 1995, whichever occurred first. The risk of SIDS was analysed using Cox proportional hazard regression, and the results are presented as hazard ratios (HR) with 95% confidence intervals (95% CI).

DISCUSSION

First degree relatives of patients with FC had no overall increased risk of SIDS, and the study did not support the shared susceptibility hypothesis. Our cohort study was population based, had complete follow up, and the data did not rely on parental recall. We find it unlikely that bias or confounding have masked an association.

Abbreviations: FC, febrile convolution; HR, hazard ratio; SIDS, sudden infant death syndrome

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