Table 1

Author, date, country	Study type (level of evidence*)	Outcomes	Key results	Study weaknesses
Ruesch, 2002, Switzerland	Systematic review	Arterial puncture	Jugular 3.0% vs. subclavian 0.5%. RR 4.7, 95% CI 2 to 10	While appropriate search terms were used, and additionally searched in languages other than English, the exact search strategy was not published
		Catheter malposition	Jugular 5.3% vs. subclavian 9.3%. RR 0.66, 95% CI 0.44 to 0.99	
		Haemo/ pneumothorax	Jugular 1.3% vs. subclavian 1.5%. RR 0.76, 95% CI 0.43 to 1.33	
		Bloodstream infection	Jugular 8.6% vs. subclavian 4.0%. RR 2.24, 95% CI 0.62 to 8.09	

CI, confidence interval; RR, relative risk.

Level 1: Recent well-done systematic review was considered or a study of high quality is available.

Rigors in febrile children may be associated with a higher incidence of serious bacterial infection

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doi: 10.1136/emj.2007.052282

A short cut review was carried out to establish whether febrile children with rigors are more likely to have a bacterial infection than febrile children with no rigors. From a search of 494 papers, only one addressed the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results and study weaknesses of this paper are summarised in table 2. The clinical bottom line is that the absence of rigors makes it slightly less likely that there will be positive bacterial cultures.

Three-part question

In [febrile children presenting to the emergency department] are [rigors] suggestive of [serious bacterial infection]?

Clinical scenario

An 18-month-old child presents to the emergency department with a temperature of 39°C. The child's temperature falls to 37.2°C following treatment with paracetamol. The child has an inflamed pharynx on examination, and when a history is taken, the child's mother reports that the child has experienced rigors

in the last 24 h. There has been no foreign travel. The mother asks if the rigor makes bacterial infection more likely.

Search strategy

Cochrane Library: search term "Rigors". Medline: search terms "Rigors" OR "Rigor"; limits "All child: 0–18 years" "Humans". CINAHL: search terms "Rigor AND (Febrile OR Pyrexia)", 1980 to 2007/02. EMBASE.

Search outcome

Cochrane Library: no relevant papers; Medline, 494 hits, 1 relevant; CINAHL: 1 hit, 0 relevant; EMBASE: 108 hits, same single relevant paper as found on Medline.

Comments

Only one paper was found which examined the significance of rigors in febrile children. The children were already judged ill enough to require hospital admission, and so may not be representative of patients presenting directly to the emergency department. The diagnosis of presumed bacterial infection in this paper was made on clinical grounds in some children in the absence of positive cultures. All children had blood, urine and stool cultures. No data are given in the paper in regard to how many children had a lumbar puncture, nor are the results of cerebrospinal fluid cultures given. Lumbar puncture was only performed when felt to be clinically indicated. Throat swabs were not taken.

► CLINICAL BOTTOM LINE

Children admitted to hospital with a febrile illness but no rigors are less likely to have positive bacterial cultures than those who have rigors. They may, however, still have a clinical diagnosis of bacterial infection.

Tal Y, Even L, Kugelman A, *et al*. The clinical significance of rigors in febrile children. *Eur J Pediatr* 1997;156:457–9.

Table 2

Author, date, country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Tal <i>et al</i> , 1997, Israel	Children admitted to paediatric ward with febrile illness, 100 children who had experienced rigors before admission, 334 children who had not experienced rigors	Retrospective cohort study	Proven bacterial infection (positive blood, urine or stool culture) Diagnosis of presumed bacterial infection	15% rigor group had positive culture vs. 6% of non-rigor group. Sensitivity 0.71, specificity 0.52, PPV 0.15, NPV 0.94, LR 1.47 67% of rigor group presumed bacterial infection vs 50% of non-rigor. Sensitivity 0.57, specificity 0.6, PPV 0.67, NPV 0.5, LR 1.42	All children unwell enough to require hospitalisation. Allocation to group on basis of history of rigors, not observed rigors by clinician. No blinding for either outcome. Diagnosis of presumed bacterial infection in absence of positive culture was in part subjective

LR, logistic regression; NPV, negative predictive value; PPV, positive predictive value.