

Towards evidence based emergency medicine: Best BETs from the Manchester Royal Infirmary

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Best Evidence Topic reports (BETs) summarise the evidence pertaining to particular clinical questions. They are not systematic reviews, but rather contain the best (highest level) evidence that can be practically obtained by busy practising clinicians. The search strategies used to find the best evidence are reported in detail in order to allow clinicians to update searches whenever necessary. Each BET is based on a clinical scenario and ends with a clinical bottom line which indicates, in the light of the evidence found, what the reporting clinician would do if faced with the same scenario again. The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary¹ or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere.² The BETs shown here together with those published previously and those currently under construction can be seen at <http://www.bestbets.org>.³ Three BETs are included in this issue of the journal.

- ▶ Central venous catheterisation: internal jugular or subclavian approach?
- ▶ Rigors in febrile children may be associated with a higher incidence of serious bacterial infection
- ▶ Treatment of jellyfish stings in UK coastal waters: vinegar or sodium bicarbonate?

1. Carley SD, Mackway-Jones K, Jones A, *et al*. Moving towards evidence based emergency medicine: use of a structured critical appraisal journal club. *J Accid Emerg Med* 1998;**15**:220–2.
2. Mackway-Jones K, Carley SD, Morton RJ, *et al*. The best evidence topic report: a modified CAT for summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;**15**:222–6.
3. Mackway-Jones K, Carley SD. [bestbets.org](http://www.bestbets.org): Odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;**17**:235–6.

Central venous catheterisation: internal jugular or subclavian approach?

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A short cut review was carried out to establish whether the internal jugular or the subclavian approach to central venous catheterisation results in fewer complications. A systematic

review, published in 2002, addressed this question. No more recent studies were found. The salient features of this review are summarised in table 1. The clinical bottom line is that there does not appear to be any great advantage either way.

Three-part question

In [patients undergoing central venous catheterisation] is the [internal jugular or the subclavian approach] associated with [fewer complications]?

Clinical scenario

A 50-year-old man with non-insulin dependent diabetes presents to the emergency department with a 3 day history of fever, acute confusion and lethargy. On assessment you find him in septic shock and commence peripheral fluid resuscitation. As part of the early goal directed management of this man you need to place a central venous catheter but wonder which route will be more successful and produce fewer complications.

Search strategy

Medline 1950 to May 2007 using the OVID interface. Cochrane database of systematic reviews: [catherisation.mp OR exp catheterization/OR exp catherization, central venous/OR central venous.mp OR central vein catheteri\$.mp OR central lin\$.mp] AND [(exp jugular veins/OR internal jugula\$.mp) AND (exp subclavian vein/OR subclavian vein.mp)]. LIMIT to human and English language.

Search outcome

Altogether 561 papers were produced by searching from 1950. Once the systematic review was identified, we limited our search to publications after this date involving humans and published in English. This produced 128 papers, none of which helped answer our question.

Comments

The systematic review was well conducted but found no randomised trials to answer the question. The authors have analysed a number of prospective cohort studies that have published dichotomous results for the outcomes concerned. They found little difference between the two sites in terms of early and late complications. The authors concluded that randomised trials are required.

▶ CLINICAL BOTTOM LINE

There appears to be no difference between the jugular and subclavian vein approaches for central vein catheterisation. In an individual patient, the approach should probably be to choose the one you have most successful experience with—although a case could be made for the opposite!

Ruesch S, Walder B, Tramer MR. Complications of central venous catheters: internal jugular versus subclavian access – a systematic review. *Crit Care Med* 2002;**30**:454–60.

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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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.