

BEST EVIDENCE TOPIC REPORTS

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

Edited by K Mackway-Jones

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.

The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary.¹ 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 The four topics covered in this issue of the journal are:

- Use of the McCoy laryngoscope in patients with suspected cervical spine fracture
- White cell count and diagnosing appendicitis in pregnancy
- Oral acyclovir in acute cutaneous herpes zoster
- Urinary trypsinogen to rule out acute pancreatitis in patients with abdominal pain

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.

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Use of the McCoy laryngoscope in
patients with suspected cervical spine
fracture

Report by Simon Carley, *Specialist Registrar*
Search checked by John Butler, *Specialist Registrar*

Clinical scenario

A 24 year old man is brought to the emergency department after a fall. He has reduced conscious level and requires intubation to secure his

airway. As a cervical injury cannot be excluded you attempt intubation in the neutral position with manual in-line cervical spine stabilisation. At laryngoscopy using a size 4 Macintosh blade you are unable to visualise the cords (grade 3 view) but manage to intubate the patient using a gum elastic bougie. Later, when discussing the case with an anaesthetist, you hear that the McCoy laryngoscope is said to give a better view than a conventional laryngoscope when patients are intubated in the neutral position. You

Table 1

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Laurent SC <i>et al</i> , 1996, UK	167 elective patients intubated in the neutral c-spine position. Each patient had laryngoscopy performed with both Macintosh and McCoy (both size 3 blades)	Controlled clinical trial	Cormack view at laryngoscopy Number of patients whose Cormack score improved	Grade 3 or 4 view in 33% of cases with Macintosh <i>v</i> 5% with McCoy ($p < 0.001$). View improved by one or more Cormack grades in 57% of patients using McCoy laryngoscope	Elective setting. Only a size 3 blade used. There were no grade 4 views in this study.
Uchida T <i>et al</i> , 1997, Canada	50 female patients undergoing elective surgery. patients were kept in the neutral position by an assistant using in-line cervical immobilisation. Either a size 3 Macintosh or a size 3 McCoy blade was used	Controlled clinical trial	Percentage of grade 3 or 4 views at laryngoscopy Number of patients in whom view improved with McCoy	76% with Macintosh <i>v</i> 16% with McCoy blade ($p < 0.01$) View was improved in 74% of cases using Cormack score. The 2 patients scoring grade 4 with the Macintosh did not improve with the McCoy	Only female patients studied. Elective setting. All patients were first examined using the Macintosh before using the McCoy.

wonder is there is any evidence to back this up before you go and buy some more equipment for the emergency department.

Three part question

In [patients requiring intubation with the neck in the neutral position] is [a McCoy laryngoscope better than an Macintosh laryngoscope] at [optimising the view of the laryngeal inlet]?

Search strategy

Medline 1966–06/00 using the OVID interface. ({McCoy.mp} AND {exp intubation, intratracheal OR exp laryngoscopy OR “laryngoscope”.mp}) LIMIT to human AND english.

Search outcome

Altogether 27 papers found of which 25 were irrelevant or of insufficient quality. The remaining two papers are shown in the table 1.

Comments

Failure to intubate a trauma patient because the larynx cannot be visualised is a feared sce-

nario, yet in-line cervical stabilisation makes the view at laryngoscopy difficult. These studies demonstrate a clear advantage to the McCoy blade as compared with the Macintosh blade. In particular the incidence of grade 3 views markedly reduces with the McCoy blade. Both studies fail to assess the ability to actually intubate the patient, rather they just analyse the view of the cords. However, visualising the cords is a useful proxy marker for ease of intubation.

Clinical bottom line

A McCoy laryngoscope is a useful aid in difficult intubation, and should be available when rapid sequence induction is attempted in the patient in whom a cervical spine injury is suspected.

- 1 Laurent SC, de Melo AE, Alexander-Williams JM. The use of the McCoy laryngoscope in patients with simulated cervical spine injuries. *Anaesthesia* 1996;51:74–5.
- 2 Uchida T, Hikawa Y, Saito Y, et al. The McCoy levering laryngoscope in patients with limited neck extension. *Can J Anaesth* 1997;44:674–6.

White cell count and diagnosing appendicitis in pregnancy

Report by Rob Williams, *Clinical Fellow*

Search checked by Kevin Mackway-Jones, *Consultant*

Clinical scenario

A 27 year old woman who is 14 weeks pregnant, presents to the emergency department with the symptoms and signs of appendicitis. You refer the case to the acute surgical team who ask you to obtain a white cell count. You wonder whether this test has any value in this situation.

Three part question

In [pregnant women with a clinical diagnosis of appendicitis] is [a raised white cell count] useful in [diagnosis]?

Search strategy

Medline 1966–06/00 using the OVID interface. ({exp appendicitis OR appendicitis.mp} AND {exp leukocyte count OR leukocyte count\$.mp OR neutrophil count\$.mp OR white cell

count\$.mp} AND {exp pregnancy OR pregnancy.mp}) LIMIT to human AND english.

Search outcome

Altogether seven papers found of which five were irrelevant or of insufficient quality for inclusion. The remaining two papers are shown in table 2.

Comments

The only available studies deal with the wrong spectrum of patients. The women included all underwent appendectomy; this is a selected sample of pregnant women presenting to emergency departments with the clinical signs and symptoms of appendicitis.

Clinical bottom line

There is no evidence to support the use of isolated white cell counts in the diagnosis of acute appendicitis in pregnant women.

- 1 Doberneck RC. Appendectomy during pregnancy. *Am Surg* 1985;51:265–8.
- 2 Anderson B, Nielsen TF. Appendicitis during pregnancy: diagnosis, management and complications. *Arch Obstet Gynecol Scand* 1999;78:758–62.

Table 2

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Doberneck RC, 1985, USA	29 pregnant women undergoing appendectomy.	Retrospective survey	WCC >10 000 WCC >15 000	Sensitivity 85% Specificity 33% Positive likelihood ratio 1.28 Negative likelihood ratio 0.45 Sensitivity 50% Specificity 89% Positive likelihood ratio 4.5 Negative likelihood ratio 0.56	Retrospective selection bias. Women undergoing appendectomy only. Small numbers. Incomplete data.
Anderson B and Nielsen TF, 1999, Sweden	56 pregnant women undergoing appendectomy.	Retrospective survey	WCC >16 000	Sensitivity 60% Specificity 5% Positive likelihood ratio 0.63 Negative likelihood ratio 8.4	Retrospective selection bias. Women undergoing appendectomy only. Small numbers. Incomplete data.

Oral acyclovir in acute cutaneous herpes zoster

Report by Polly Terry, *Specialist Registrar*
Search checked by Susan Buttress, *Research Physiotherapist*

Clinical scenario

A 56 year old immunocompetent man presents to the emergency department at 10 pm on a Saturday night with acute shingles. You know acyclovir is effective but wonder how quickly it needs to be started.

Three part question

In [immunocompetent adults with acute shingles] is [early acyclovir better than late acyclovir] at [promoting rash healing and minimising the painful period]?

Search strategy

Medline 1966–06/00 using the OVID interface. ({exp herpes zoster OR herpes zoster.mp OR shingles} AND {exp acyclovir OR acyclovir.mp OR exp antiviral agents OR antiviral agent\$.mp OR anti viral.mp OR antiviral.mp}) AND maximally sensitive RCT filter LIMIT to human AND english.

Search outcome

Altogether 363 papers found of which 360 were irrelevant or of insufficient quality for inclusion, or subject to meta-analysis. The remaining three papers are shown in table 3.

Comments

All three meta-analyses used three core papers—but there was enormous variation in selection of the other papers. Thus selection bias may have occurred.

Clinical bottom line

Early oral acyclovir (less than 48 hours after onset of rash) will significantly shorten the duration of herpes related pain in shingles.

- 1 Jackson JL, Gibbons R, Meyer G, *et al*. The effect of treating herpes zoster with oral acyclovir in preventing postherpetic neuralgia. *Arch Intern Med* 1997;157:909–12.
- 2 Whitley RJ, Shukla S, Crooks RJ. The identification of risk factors associated with persistent pain following herpes zoster. *J Infect Dis* 1998;178 (suppl 1):S71–5.
- 3 Wood MJ, Shukla S, Fiddian AP, *et al*. treatment of acute herpes zoster: effect of early (< 48 h) versus late (48–72 h) therapy with acyclovir and valaciclovir on prolonged pain. *J Infect Dis* 1998;178 (suppl 1):S81–4.

Table 3

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Jackson JL <i>et al</i> , 1997, USA	5 placebo controlled randomised clinical trials. All trials used acyclovir 800 mg 5 times daily within 72 h of onset	Meta-analysis	Pain at 6 months	Summary odds ratio 0.54 (0.36, 0.81) in patients treated with acyclovir	
Whitley RJ <i>et al</i> , 1998, USA	6 randomised controlled double blind studies Trials 1 to 3 compared oral acyclovir with placebo.	Meta-analysis	Factors influencing duration of pain Factors not influencing duration of pain	Age, prodromal pain, acute pain intensity Sex, time from rash onset to initiation of treatment	No separate data for trials 1–3.
Wood MJ <i>et al</i> , 1998, UK	3 placebo controlled studies or oral acyclovir. All trials used acyclovir 800 mg 5 times daily. Early (<48 h) v late (48–72 h) treatment	Meta-analysis	Resolution of zoster related pain in: All patients Patients over 50 y	Hazard ratio 1.79 (1.43, 2.39) Hazard ratio 2.13 (1.42, 3.19)	

Urinary trypsinogen to rule out acute pancreatitis in patients with abdominal pain

Report by John Butler, *Specialist Registrar*
Search checked by Magnus Harrison, *Research Fellow*

Clinical scenario

A 45 year old woman attends the emergency department with a four hour history of acute epigastric pain. She has a history of alcohol use. Examination reveals epigastric tenderness but no peritonism. You consider pancreatitis and wonder whether a single urinary trypsinogen measurement can be used to rule out this diagnosis.

Three part question

In [patients with abdominal pain and a suspicion of pancreatitis] can [a urinary trypsinogen test] [rule out pancreatitis]?

Search strategy

Medline 1966–06/00 using the OVID interface. ({exp abdominal pain OR abdominal pain.mp OR exp pancreatitis OR exp pancreatitis, acute necrotising OR exp pancreatitis, alcoholic OR pancreatitis.mp} AND exp trypsin OR exp trypsinogen OR trypsin\$.mp OR trypsinogen\$.mp}) AND sensitivity.tw LIMIT to human AND english.

Search outcome

Altogether 74 papers found of which 71 were irrelevant or of insufficient quality for inclusion. The remaining three papers are shown in table 4.

Comments

The sensitivity of urinary trypsinogen is around 95%. Its clinical efficacy is much higher than the tests that are commonly used.

Table 4

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Kemppainen EA <i>et al</i> , 1997, Finland	500 consecutive patients attending an emergency department with abdominal pain. Urinary trypsinogen <i>v</i> serum amylase <i>v</i> urinary amylase	Diagnostic cohort	Urinary trypsinogen (50 ng/ml) Serum amylase (300 IU) Urinary amylase (2000 IU/l)	Sensitivity 94% (92–96%) Specificity 95% (93–97%) Sensitivity 85% Specificity 91% Sensitivity 83% Specificity 88%	
Tenner S <i>et al</i> , 1997, USA	189 patients. 139 with pancreatitis, 50 without.	Diagnostic cohort	Urinary trypsinogen (10 ng/ml)	NPV 100%	
Kylanpaa-Back ML <i>et al</i> , 2000, Finland	525 consecutive patients with abdominal pain presenting to 2 emergency departments. Urinary trypsinogen 2 test strip	Diagnostic test study	Diagnosis of pancreatitis	Sensitivity 96% (94–97%) Specificity 92% (90–95%)	Gold standard was serum and urinary amylase, clinical features and CT.

Clinical bottom line

Urinary trypsinogen can be used as a sensitive tool to exclude pancreatitis in emergency departments.

- 1 Kemppainen EA, Hedstrom JI, Puolakkainen PA, *et al*. Rapid measurement of urinary trypsinogen-2 as a screen-

ing test for acute pancreatitis. *N Engl J Med* 1997;336:1788–93.

- 2 Tenner S, Fernandez-del Castillo C, Warshaw A, *et al*. Urinary trypsinogen activation peptide (TAP) predicts severity in patients with acute pancreatitis. *Int J Pancreatol* 1997;21:105–10.

- 3 Kylanpaa-Back ML, Kemppainen E, Puolakkainen P, *et al*. Reliable screening for acute pancreatitis with rapid urine trypsinogen-2 test strip. *Br J Surg* 2000;87:49–52.