BEST EVIDENCE TOPIC REPORTS

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

Edited by Simon D Carley

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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 practicing 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 Infirmary[1] 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] 4 BETs are included in this issue of the journal.

- ▶ Clean catch or bag specimen in UTI in non toilet trained children?
- ▶ Intravenous Magnesium in shock-resistant tachyarrhythmias
- ▶ Intranasal naloxone in suspected opioid overdose
- ▶ Intravenous NSAID's in the Management of Renal Colic

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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;15:220–222.

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;15:222–226.

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.

Clean catch or bag specimen in UTI in non toilet trained children?

Report by Rachel Jenner, *Specialist Registrar*

Search checked by Shadi Afzalnia, *Medical Student*

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A short cut review was carried out to establish whether bagged specimens of urine in children are more likely to be contaminated than clean catch specimens. 316 papers were found, of which two presented the best evidence to answer the clinical question. The author, date and country of

publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. The clinical bottom line is that clean catch is a better non-invasive method of obtaining a urine specimen, compared with bag urine, in non-toilet trained children.

Three part question

In a [non toilet-trained child with suspected UTI] is [clean catch or bag specimen of urine] better at [reducing the risk of contamination and therefore providing an accurate diagnosis of UTI]?

Clinical scenario

An 18 month old child with fever and vomiting is brought to the emergency department by its parents. There is no clear focus of infection on clinical examination and you suspect the child has a urinary tract infection. You wonder if a bag specimen of urine or clean catch specimen would be more accurate in diagnosing UTI.

Search strategy

Using Medline database 1966 to week 3 November 2005 via OVID.

The Cochrane Library 2005, Issue 4.

CinAHL: CINAHL 1982 to December 2005.

Search details

Medline: [uti.mp OR exp Urinary Tract Infections] AND [specimen.mp OR exp Specimen Handling/OR urine bag.mp OR clean catch.mp] AND [BestBETS paediatric filter] LIMIT to human and English language.

Cochrane: urinary and specimen and catch.

CinAHL: [specimen.mp OR exp Specimen Handling/ OR urine bag.mp OR clean catch.mp]

Search outcome

Medline: 337 papers were found of which 2 were relevant. Cochrane: 17 citations. no new papers found. CinAHL: 100 citations. no new papers found

Comments

There is much debate in the literature about the best technique for collecting urine specimens in children, however little evidence comparing the two methods commonly used in Emergency Departments. Alam *et al* reveals that clean catch is a better method of obtaining a urine specimen than bag urine, however, both techniques are not 100% sterile and free of contamination, and therefore can produce misleading results. Other methods of obtaining a sterile specimen of urine in non-toilet trained children should be researched, such as supra-pubic aspiration or catheterisation. One concern may be that the clean catch specimen is seemingly more difficult to collect (an increased miss rate in the Alam study) and this may present problems in the emergency department setting.

Table 1

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Hardy <i>et al</i> 1976 UK	30 unwell children with suspected UTI	Compared clean catch, bag specimen and suprapubic aspiration of urine	Pure growth or contamination	bag specimens 4/30 pure growth 22/30 contaminated. Clean catch specimens 2/30 pure growth 22/30 mixed growth. Suprapubic aspiration 4/30 pure growth, no contaminated specimens	Children were in-patients in paediatric ward having routine screening. No power study and small numbers. Authors actually found supra-pubic aspiration to be most effective (but not specifically the topic of this BET) More boys than girls
Alam <i>et al</i> 2005 Brazil	191 children, (125 were boys) <3 years without known UTI. All children had attempts at clean catch, urine bag and cotton wool pad sampling. If all three results were positive it was declared a positive UTI and excluded from the analysis.	Diagnostic study	Bacterial contamination of three methods of urine sampling. Missing samples (i.e. not obtainable by method)	Clean catch 14.7%, urine bag 26.6%, urine pad 29% (significantly higher than for clean catch $p<0.01$) clean catch (12%), bag (4%), pad (4%).	Exclusion of true UTIs may have biased results.

► CLINICAL BOTTOM LINE

One study has shown that clean catch is a better non-invasive method of obtaining a urine specimen, compared with bag urine, in non-toilet trained children.

Hardy JD, Furnell PM, Brumfitt W. Comparison of sterile bag, clean catch and suprapubic aspiration in the diagnosis of urinary tract infection in early childhood. *Br J Urol* 1976;**48**(4):279–83.

Alam MT, Coulter JB, Pacheco J, *et al*. Comparison of urine contamination rates using three different methods of collection: clean-catch, cotton wool pad and urine bag. *Annals of Tropical Paediatrics* 2005 Mar;**25**(1):29–34.

Intravenous magnesium in shock-resistant tachyarrhythmias

Report by Ayan Sen, Senior House Officer,
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doi: 10.1136/emj.2006.034694

A short cut review was carried out to establish whether intravenous magnesium is effective in cardiac arrest secondary to shock resistant tachyarrhythmias. 42 papers were found, of which five presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. The clinical bottom line is that magnesium has not been conclusively shown to be useful in shock-resistant tachyarrhythmias when measured against clinically important outcomes.

Three part question

Does [intravenous magnesium] lead to [return of spontaneous circulation] in [shock-resistant tachyarrhythmias]

Clinical scenario

A 65 year old man suffered a witnessed out-of-hospital cardiac arrest. He received 20 minutes of basic and advanced cardiac life support measures in the field. On arrival in the emergency department, the rhythm showed persistent ventricular fibrillation and he continued to be pulseless. You decide to continue another cycle of defibrillation and think of anti-arrhythmic drugs apart from correctable causes. You know that amiodarone is helpful. Your colleague

mentions the use of magnesium as per ALS guidelines. Is Magnesium really helpful in return to spontaneous circulation in refractory ventricular tachyarrhythmias?

Search strategy

MEDLINE OVID interface on the world wide web.
1966–Dec 2005

EMBASE 1980–2005

COCHRANE Library Issue 4, 2005

Search details

{exp MAGNESIUM/or magnesium.mp} AND {exp Ventricular Fibrillation/or ventricular fibrillation.mp OR exp Tachycardia, Ventricular/or ventricular tachycardia.mp OR ventricular tachyarrhythmia\$.mp OR exp Heart Arrest/or cardiac arrest.mp} AND {refractory.mp. OR shock-resistant.mp. OR intractable.mp OR irreversible.mp. OR resistant.mp. OR unresponsive.mp. OR non-responsive.mp. OR pulseless.mp OR persistent.mp OR Shock-refractory} LIMIT to {human and english language}

Search outcome

42 articles in total out of which five were relevant trials

Comments

Magnesium use in refractory ventricular tachyarrhythmias gained interest after case reports by Tobey, Craddock, Baraka and others which showed return of spontaneous circulation and neurological intact discharge. However, subsequent randomised trials dampened the enthusiasm. Based on current evidence, magnesium does not seem to effect return of spontaneous circulation or survival from hospital with neurologically intact parameters. However, the trials are all low powered with different other methodological issues involved. These should be addressed in large multi-centred trials before any further use. Ethical approval for such large multi-centred trials with different EMS systems will always be a major stumbling block.

► CLINICAL BOTTOM LINE

Magnesium has not been conclusively shown to be useful in shock-resistant tachyarrhythmias when measured against clinically important outcomes.

Miller B, Craddock L, Hoffenberg S, *et al*. Maines, Masick D Pilot study of intravenous magnesium sulfate in refractory cardiac arrest: safety data and recommendations for future studies. *Resuscitation* 1995 Aug;**30**(1):3–14.

Fatovich DM, Prentice DA, Dobb GJ. Magnesium in cardiac arrest (The MAGIC Trial). *Resuscitation* 1997 Nov;**35**(3):237–41.