BEST EVIDENCE TOPIC REPORTS

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

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Emerg Med J 2006;23:929-936

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 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.

- ▶ Silver sulphadiazine cream in burns
- ▶ Procedural sedation for cardioversion
- ▶ The relationship between post-traumatic stress disorder and affective disorder

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: Odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;17:235-6.

Silver sulphadiazine cream in burns

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doi: 10.1136/emj.2006.043059

Abstract

A short-cut review was carried out to establish whether silver sulphadiazine cream is better than normal dressing in promoting burn healing without infection. A total of 410 papers were found using the reported searches, of which 12 showed 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. It is concluded

that although there is evidence of antibacterial effect, there is no direct evidence of improved healing or reduced infection.

Clinical scenario

A 25-year-old science teacher presents to the emergency department with a partial thickness burn on her hand because of being careless with a bunsen burner. You wonder if silver sulphadiazine cream is better than normal dressings in reducing the risk of infection and healing time.

Three part question

In [an adult patient with burns] is [silver sulphadiazine cream better than normal dressings] at [reducing infection and decreasing the time required for healing?]

Search strategy

Medline using the OVID interface 1966 to September week 3 2006. [exp Silver Sulfadiazine/OR silver sulphadiazine.mp. OR exp Sulfadiazine/OR flammazine OR flammazine] and [exp Burns/OR thermal injury.mp. OR thermal burn\$.mp. OR burn\$.mp. OR thermal injur\$.mp OR scald.mp. OR heat injur\$.mp.] limit to English language and humans.

Cochrane Database of Systematic Reviews Issue 2 2006. "silver sulphadiazine" or "flamazine"

Outcome

410 papers were found in Medline, of which 12 were relevant.

Comments

Silver sulphadiazine has been shown to decrease the bacterial colonisation of burn wounds. The mechanism is not clear, but each of the components has a synergistic effect on the other to provide a bacteriocidal effect *in vivo*. Adverse effects include local skin reaction, hypersensitivity reactions and occasionally leucopenia, although this is usually self-limiting.

Despite this fact, there is little evidence to show that the use of this topical agent reduces bacterial wound infections or sepsis in patients with burns. The small studies listed here suggests that sulphadiazene may in fact delay wound healing and the way forward may be to simply provide a clean, moist and undisturbed environment to allow healing. One confounding factor in these studies may be that the flammazine dressings tended to be changed every 12 h whereas the other dressings were left intact for longer.

▶ CLINICAL BOTTOM LINE

Despite evidence of the antibacterial properties of this compound, no evidence showing a definitive improvement in outcome in terms of infection rates or healing time was found. Local advice should be followed.

Inman R, Snelling C, Roberts F, *et al*. Prospective comparison of silver sulfadiazine 1 per cent plus chlorhexidine digluconate 0.2% (Silvazine) and silver sulfadiazine 1% (Flammazine) as prophylaxis against burn wound infection. *Burns* 1984;11:35-40.

Table 1

Author, date and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Inman <i>et al.</i> , 1984, Canada	121 patients over the age of 1 year presenting to one centre, within 24 h of receiving a burn, which had a full-thickness component to it	Patients were randomised to receive Silvadene (1% SSD and 0.2% chlorhexidine gluconate, 54 patients) or Flamazine (1% SSD, 67 patients) dressings for their burn. Controlled clinical trial	Wound infection rates Mortality rate	10 patients (19%) in the silvadene group, 12 (18%) patients in the Flamazine group 3 deaths in the Silvadene group and 4 deaths in the Flamazine group	Small group Not blinded
Stem H, 1989, Australia	8 patients with 15 burn areas, half-burn area dressed with control dressing (tulle gras) and half dressed with SSD		Healing time	Group 1, SSD—19.25 days Tulle—14.41 days, Significant (paired t test $p<0.05$). Group 2, SSD—10.85 days, Tulle—10.5 days. No significant difference	Patients with complicating factors such as inhalation injury or myoglobinuria were not excluded. 3 burn areas that required grafting excluded from analysis. Limb burns split into proximal and distal sections and distal sections selected for SSD treatment. Not blinded, subjective end point Crosscontamination of dressings
Gerdling <i>et al.</i> , 1990, USA	Group 2–20 donor site patients (dressings applied as Inman, 1989) 52 patients with 56 partial thickness burns Group 1 ($n=30$) treated with Biobrane Group 2 ($n=26$) treated with SSD	Randomised controlled trial	Infection Healing time	Two groups similar. 10% in group 1 v 7.7% in group 2 Significantly less in group 1 than group 2 (10.6 (0.8) v 15 (1.2) days, $p<0.01$)	Study used small numbers. Trial was not blinded. Group 2 patients were required to change their own dressing, removing and then replacing all of the cream every 12 h. Group 1 patients had the dressing replaced or removed at clinic 24–36 h after the injury. Unblinded, subjective end point Small numbers of patients were used. Patients in the silvadene group were instructed to wash burns with soap and reapply silvadene on a 12-h basis. Duoderm group had dressings left intact unless fell off
Wyatt <i>et al.</i> , 1990, USA	42 patients presenting to the emergency room with second-degree burns over 8 months. 20 patients treated with Silvadene (SSD), 22 patients treated with Duoderm (hydrocolloid dressing). Followed up until wound healed Healing assessment by blinded investigator	Randomised study	Pain Infection Mean healing time	More severe in the silvadene group (two tailed t test $p<0.01$) No signs of clinical infection in either treatment group Silvadene—15.59 1.86 days, Duoderm—10.23 (0.68) days. Statistically different (two tailed t test $p<0.01$)	
Afilalo <i>et al.</i> , 1992, Canada	48 patients presenting to one centre with partial-thickness burns $<15\%$ in size and <48 h old were initially randomised. 18 patients dropped out, leaving 15 in each group	Patients were randomised to receive a Duoderm dressing or SSD dressing	Healing time	10.7 (4.8) days for duoderm group, 11.2 (4.2) days for SSD, not significant	Small study with large drop-out rate. Wound evaluation not blinded
Soroff <i>et al.</i> , 1994, USA	15 adult patients with non-contiguous partial-thickness burns of similar size and severity. 2 patients dropped out, the other due to infection at another site and one due to discomfort at collagenase site	2 burns on each patient were randomised to SSD dressing or collagenase ointment with polymyxin B sulphate/Bacitracin spray.	Median time to clean wound bed Median time to epithelialisation	6 days in collagenase group v 12 days in SSD group ($p=0.001$) 10 days in collagenase group v 15 in SSD group, ($p=0.001$)	Small group. Unblinded, subjective assessment. Method of randomisation unclear
Bugmann <i>et al.</i> , 1998, Switzerland	76 paediatric patients presenting with burns. Patients with facial burns and burns, >24 h old were excluded. 5 patients withdrew from each group due to the need for skin grafting	The patients were randomised and 35 children received Flamazine dressings, whereas 41 received Mepitel dressings (silicon-coated nylon dressing with no biological compounds)	Mean healing time in days Infection rates	Mepitel 8.11 days, Flamazine 11.67 days. $p=0.004$ 1 patient in Flamazine group, no patients in Mepitel group. NS	Small study not blinded

Table 1 Continued

Author, date and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Subrahmanyam M, 1998, India	50 patients with superficial thermal burn treated over 16 months, <40% TBSA and treated within 6 h of the burn. Group 1 (n=25)-treated with pure honey. Group 2 (n=25)-treated with SSD	Randomised Controlled Trial	Healing rates by day 21	Group 1—100% of wounds healed, Group 2—84% of wounds healed (p=0.1)	No control group where wounds were left to heal naturally or compared with normal dressings. The four patients in group 2 were stated to have converted to deep burns and required grafting. Method of randomisation not stated. Not blinded. Calculated p values on percentages rather than actual figures
Barret <i>et al</i> , 2000, USA	20 paediatric patients with thermal flame or scald burns with the total burn surface area between 2 and 29%	10 patients randomised to Biobrane dressing (bilaminated composite) and 10 patients to Flamazine. Flamazine dressings were changed 12 hrly. Biobrane dressings were left in place	Days till wound healed	16.1 (0.6) days for F group, 9.7 (0.7) for B group. p<0.001	Small groups, unblinded. Power calculation has been done but not stated, which outcome this was based upon. Study underpowered to look at infection rates
Ang <i>et al</i> , 2000, Singapore	Patients between 6 and 80 years presenting with partial thickness burns to the face excluding chemical and electrical burns	Patients were randomised to receive treatment with SSD cream or Moist Exposed Burn Ointment (MEBO—based on petrolatum). After exclusions 17 received MEBO and 22 Flamazine	Healing rates by day 10 Overall healing time	14/17 in MEBO group and 17/22 in Flamazine group. NS No significant difference between groups	Small, unblinded study with subjective outcome
de Gracia, C 2001 Philippines	60 patients aged >4 months with burns areas >15% who had been admitted within 24 h of the injury	Patients were randomised to receive SSD dressings or SSD with cerium nitrate (SSD-CN)	Mean days till wound healed Development of sepsis Mortality rate	17.2 (8.3) in SSD-CN group v 25.1 (19.4) in SSD group. p=0.03 1/30 in SSD-CN group and 4/30 in SSD group. NS 1/30 in SSD-CN group and 4/30 in SSD group. NS	Relatively small study. Unblinded
Costagliola, M; Agrasi, M 2005 France, Italy	111 patients with partial-thickness burns not exceeding 5% of BSA were recruited from various centres. 1 patient in the SSD lost to follow-up	Patients were randomised to receive dressings using 0.2% hyaluronic acid and 1% SSD or 1% SSD. Creams provided in unmarked tubes and appeared identical	Median time to healing Pain evaluation	9.5 days (95% CI 7 to 14) for the HA-SSD group v 14 days (95% CI 13 to 14) in the SSD group. (p=0.007) No significant difference between groups	
SSD, silver sulphadiazine.					

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- Wyatt D, McGowan D, Najarian P.** Comparison of a hydrocolloid dressing and silver sulphadiazine cream in the outpatient management of second-degree burn. *J Trauma* 1990;**30**:857–65.
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- Soroff H, Sasvary D.** Collagenase ointment and polymyxin B sulfate/bacitracin spray versus silver sulfadiazine cream in partial-thickness burns: a pilot study. *J Burn Care Rehabil* 1994;**15**:13–17.
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- Costagliola M, Agrosi M.** Second-degree burns: a comparative, multicenter, randomized trial of hyaluronic acid plus silver sulfadiazine vs. silver sulfadiazine alone. *Curr Med Res Opin* 2005;**21**:1235–40.

Procedural sedation for cardioversion

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 doi: 10.1136/emj.2006.043067

Abstract

A short-cut review was conducted to establish whether any of the available drugs used for procedural sedation in patients with tachydysrhythmias are safer or more effective than the alternatives. In all, 135 papers were found using the reported searches, of which 7 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. It is concluded that propofol, methohexital, thiopentone and etomidate all seem to be good choices.

Clinical scenario

A 38-year-old man presents to the emergency department with palpitations and slightly light headed feeling. He has never had these symptoms before and is certain that they started 1 h before arrival. He is awake and alert with a blood pressure of 134/82 mm Hg and a pulse of 128 beats/min. His physical examination is unremarkable, with the exception of tachycardia and an irregular rhythm. You are aware that each attending staff used different drugs for procedural sedation in this situation—and that each of them has “good reasons” why their choice is the best. You wonder whether there is any evidence to support one choice over another.

Three-part question

In [patients with atrial fibrillation, atrial flutter or paroxysmal supraventricular tachycardia requiring sedation for electrical cardioversion] which [medications] are best at [achieving safe and effective procedural sedation]?

Search strategy

Medline 1966 to September Week 4 2006 using the Ovid interface. [(atrial fibrillation/th OR exp electric countershock OR cardioversion.mp) and (exp etomidate/or etomidate.mp OR exp propofol/or propofol.mp OR exp midazolam/or midazolam.mp OR exp thiopental/or thiopental.mp OR exp “Hypnotics and Sedatives”/)]. Limit to human and English.

Embase 1980 to 2006 Week 39 using the Ovid interface and multfile searching. [(atrial fibrillation/th OR exp electric countershock OR cardioversion.mp) and (exp etomidate/or etomidate.mp OR exp propofol/or propofol.mp OR exp midazolam/or midazolam.mp OR exp thiopental/or thiopental.mp OR exp “Hypnotics and Sedatives”/)] and (emergency department.mp OR emergency medicine). Limit to human and English

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[electric countershock (MeSH)] and [hypnotics and sedatives’ (MeSH)]

Outcome

A total of 135 papers were found, of which 7 were randomised trials comparing agents for sedation for cardioversion and were felt to be of sufficient quality to be included.

Comment

All of the agents used in these studies had relatively short time of onset and short duration of action with the exception of the benzodiazepines, which had considerably longer times for both. All anaesthetic agents have the potential to cause hypotension, although this did not cause any serious adverse events in any of the patients who participated in these studies. Etomidate may cause less hypotension than other agents, but causes myoclonus in some patients.

► CLINICAL BOTTOM LINE

Propofol, methohexital, thiopentone and etomidate all appear to be good choices for procedural sedation in patients requiring electrical cardioversion for atrial fibrillation, atrial flutter and paroxysmal supraventricular tachycardia. Midazolam and diazepam have a significantly longer recovery time, and can produce confusion in the recovery period as well. They should be considered a second-line agents for sedation for cardioversion.

Valtonen M, Kanto J, Klossner J. Anaesthesia for cardioversion: a comparison of propofol and thiopentone. *Can J Anaesth* 1988;**35**:479–83.

Ford S, Maze M, Gaba DA. Comparison of etomidate and thiopental anesthesia for cardioversion. *J Cardiothorac Vasc Anesth* 1991;**5**:563–5.

Canessa R, Lema G, Urzua J, et al. Anesthesia for elective cardioversion: a comparison of four anesthetic agents. *J Cardiothorac Vasc Anesth* 1991;**5**:566–8.

Gale DW, Grissom TE, Miranda JV. Titration of intravenous anesthetics for cardioversion: a comparison of propofol, methohexital, and midazolam. *Crit Care Med* 1993;**21**:1509–13.

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