nitrates or diazepam, in combination or alone, compare at resolving chest pain and as regards clinical outcome.

Search strategy

Medline 1966 to February 2006 using the OVID interface: [{exp cocaine OR cocaine-related disorders.mp.} AND {exp chest pain OR ischaemia OR angina OR acute coronary syndrome OR infarction.mp.} AND {exp diazepam OR exp benzodiazepines OR nitrates.mp.}].

Search outcome

Seven papers found of which two were relevant (table 1).

Comment(s)

The demographics of both study populations are comparable to that of cocaine users attending the emergency department. The presenting electrocardiograms were largely normal in these patients. Treatment was based largely on history and symptoms. Nitrates were used sublingually. Diazepam was administered intravenously. Very small numbers and the lack of a placebo for lorazepam in the second paper may be responsible for the reduction in pain scores seen when patients received both agents.

► CLINICAL BOTTOM LINE

In patients with cocaine induced chest pain it appears that nitrates or benzodiazepines are effective in combination or alone in resolving chest pain and improving cardiac performance. We recommend that the agent of choice may be influenced by the presence or absence of concurrent CNS symptoms.

Baumann BM, Perrone J, Hornig SE, *et al.* Randomized, double-blind, placebo-controlled trial of diazepam, nitroglycerin, or both for treatment of patients with potential cocaine-associated acute coronary syndromes. *Acad Emerg Med* 2000;7(8):878–85.

Honderick T, Williams D, Seaberg D, *et al.* A prospective, randomized, controlled trial of benzodiazepines and nitroglycerine or nitroglycerine alone in the treatment of cocaine-associated acute coronary syndromes. *Am J Emerg Med* 2003;21(1):39–42.

The use of loop diuretics in acute renal failure in critically ill patients to reduce mortality, maintain renal function, or avoid the requirements for renal support

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Abstract

A short cut review was carried out to establish whether loop diuretics are useful for critically ill patients with renal failure. A total of 1017 citations were reviewed of which two answered the three part question. The clinical bottom line is that in critically ill patients with acute renal failure, there is no evidence to suggest that the use of loop diuretics reduces mortality, reduces length of ITU/hospital stay, or increases the recovery of renal function.

Three part question

In [critically ill patients with acute renal failure] does [the use of loop diuretics] [reduce mortality, improve renal

function, reduce length of ITU/hospital stay, or reduce requirements for renal replacement therapy?]

Clinical scenario

A 65 year old male presents to the emergency department with severe pneumonia. He is intubated and placed on a ventilator because of worsening hypoxia. He has no history of previous renal disease but becomes increasingly oliguric over the next 2 h despite adequate fluid resuscitation and vasopressor support. You wonder whether the administration of a loop diuretic in order to improve/maintain his urine output would improve his prognosis and reduce the need for continuous veno-venous haemofiltration (CVVH).

Search strategy

Cochrane Database, Edition 2, 2006: Loop diuretics. OVID Medline 1966 to February week 1 2006, and EMBASE 1980 to February 2006: (exp Uraemia OR azotemia.mp OR exp Kidney Failure/ OR exp kidney failure, acute/ OR exp kidney tubular failure, acute/ OR acute tubular necrosis.mp OR acute renal failure.mp OR renal failure.mp OR acute kidney failure.mp OR ARF.mp) AND (exp Diuretics/ OR Diuretics.mp, OR loop diuretic\$.mp OR exp furosemide/ OR frusemide.mp OR exp bumetanide/ OR bumetanide.mp OR burinex.mp OR lasix.mp OR torasemide.mp OR Torem.mp) and ((critically ill or critical illness).mp OR exp Critical Illness/ OR critical care.mp OR exp Critical Care/ OR intensive care.mp OR intensive care units.mp OR exp intensive care/) limited to English and humans.

Search outcome

A total of 97 papers were found on Medline and 721 papers on EMBASE of which only two directly answered the three part question (table 2). There were 209 citations in Cochrane. No new papers were found.

Comment(s)

About one fifth of the cardiac output is directed to the kidneys. This exceeds the oxygen supply to other vital organs, such as the brain, heart, or liver. A very low fraction of oxygen delivered is extracted by the kidney, suggesting ample oxygen reserve. Paradoxically, the kidney is the organ which is most sensitive to hypoperfusion and hypoxia, with acute renal failure being one of the most frequent complications of hypotension. This is because of the physiological gradient of intrarenal oxygenation, which means that under normal physiological conditions the renal medulla functions at very low oxygen tensions. Many therapeutic interventions in the prevention or management of patients with acute renal failure have been investigated in clinical studies. Interventions to enhance renal blood flow and decrease tubular reabsorption seem to be a logical approach for the prevention of outer medullary hypoxic injury. Loop diuretics block the active sodium-potassium-chloride co-transport in the apical membrane of the thick ascending limb renal tubular cells. The loop diuretic frusemide has been shown to reduce medullary demand by inhibiting solute reabsorption and to attenuate the severity of acute renal injury in animal models. It is postulated that it may protect the human kidney from ischaemic injury. There are some small studies of low statistical power, but they are confounded by co-interventions such as low dose dopamine or mannitol. The best evidence to answer this current clinical question comes from the two observational cohorts identified in this review. The two studies collected over 2000 patients. They both document overall detriment with the use of diuretics with odds ratios of >1.0, as opposed to benefit, although the BEST investigators did not demonstrate statistical significance in their findings.

Table 2

Author, date, country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Uchino <i>et al</i> , 2004, Australia (multicentre study in 23) countries	1743 patients in intensive care units on renal replacement therapy or with acute renal failure (using pre-defined criteria). 70% of patients were treated with diuretics at study inclusion. Frusemide was the most commonly used diuretic (98%)	Prospective multi-centre (54 centres), multinational (23 countries) cohort study. Three distinct multivariate analyses were performed using propensity scoring	Unadjusted hospital mortality rates Adjustments using three multivariate models	Diuretic group (62.4%) v controls (57.1%). Odds ratio mortality 1.25 ($p<0.03$) Overall odds ratio mortality similar for all three methods. Odds ratio 1.21–1.22 (CIs 0.92 to 1.6), $p=0.10$ to $p=0.153$	Observational cohort Heterogeneity of care across 23 countries Analytical methods can only adjust for observed confounding variables not unobserved ones
Mehta <i>et al</i> , 2002, USA	552 critically ill patients with acute renal failure in four ITUs in California. 326 patients (59%) were treated with diuretics	Prospective cohort study October 1989 to 1995	Relationship between diuretic use and mortality and non-recovery of renal function Odds ratio of death when patients who died in week 1 were excluded Overall in-hospital mortality	Increased risk of death and non-recovery of renal function with diuretic use. Odds ratio 1.77 (CIs 1.14 to 2.76) in group given diuretics Odds ratio of death 3.12 (CIs 1.73 to 5.62) Odds ratio 1.68 (CIs 1.06 to 2.64)	Prospective observational cohort study Patients given diuretics were likely to be older and more likely to have a history of CCF ($p<0.001$) and had lower measured cardiac index ($p<0.001$) Some inclusion criteria debatable

The question of whether an RCT can be justified on the basis of these observational findings is debatable.

► CLINICAL BOTTOM LINE

In critically ill patients with acute renal failure, there is no evidence to suggest that the use of loop diuretics reduces mortality, reduces length of ITU/hospital stay, or increases the recovery of renal function.

Uchino S, Doig GS, Bellomo R, *et al*. Beginning and Ending Supportive Therapy for the Kidney (B.E.S.T. Kidney) Investigators. Diuretics and mortality in acute renal failure. *Crit Care Med* 2004;**32**(8):1669–77.

Mehta RL, Pascual MT, Soroko S, *et al*. Diuretics, mortality, and nonrecovery of renal function in acute renal failure. *JAMA* 2002;**288**(20):2547–53.

Kocher's or Milch's technique for reduction of anterior shoulder dislocations

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Abstract

A short cut review was carried out to establish whether Kocher's or Milch's technique was better at reducing shoulder dislocations. A total of 304 papers were found of which one answered the three part question. The clinical bottom line is that the individual preference of physicians for either Kocher's or Milch's method of reduction is not supported by the evidence.

Three part question

In an [adult patient with an anterior dislocation of the shoulder] is [Kocher's or Milch's technique] best at achieving [a successful, uncomplicated reduction]?

Clinical scenario

A 25 year old man presents to your emergency department with a right shoulder injury following a rugby tackle. Clinical examination and a series of shoulder X rays reveal an anterior shoulder dislocation with no associated neuro-vascular deficit or fracture. You wonder whether Kocher's or Milch's technique would be most successful in reducing the dislocation without complication.

Search strategy

Medline 1966 to May 2006 using the OVID interface: ([exp shoulder dislocation OR shoulder dislocation.mp OR dislocated shoulder.mp] AND [exp manipulation orthopedic OR manipulation orthopaedic.mp OR manipulation.mp OR reduction.mp OR Kocher\$.mp OR Milch\$.mp]) limited to human and English language. Cochrane, Edition 2, 2006: Shoulder dislocation.

Search outcome

A total of 304 papers were found on Medline of which only one addressed the question (table 3). There were a total of 97 Cochrane citations; the same paper was found.

Comment(s)

This was the only paper found that compared Kocher's and Milch's techniques in attempting to reduce an anterior dislocation of the shoulder. The data presented are not internally consistent and the results presented are not statistically significant.

No firm conclusions can be drawn from this paper. The results suggest, however, that Milch's technique should be tried initially as it is possibly less traumatic than Kocher's technique, albeit slightly less effective. Larger trials are needed to confirm this.

► CLINICAL BOTTOM LINE

The individual preference of physicians for either Milch's or Kocher's method of reduction is not supported by the evidence.

Beattie TF, Steedman DJ, McGowan A, *et al*. A comparison of the Milch and Kocher techniques for acute anterior dislocation of the shoulder. *Injury* 1986;**17**(5):349–52.