Table 1

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Gorelick MH and Shaw KN, 1999, USA	Children from 26 previous studies age range from 0–21 years and from outpatients, wards and emergency departments	Meta-analysis	Sensitivity and specificity of Gram stain, leucocyte esterase, nitrite and pyuria against a gold standard of urine culture. Only tests using definition of UTI as >100 000 colony forming units used for calculating sensitivity and specificity	Sensitivity: Gram stain 0.93, leucocyte esterase or nitrite 0.88, Pyuria 0.67 (>5 WC), 0.77 (>10 WC) Specificity: Gram stain 0.95, leucocyte esterase and nitrite 0.96	Significant heterogeneity between tests performed, method of collection, age group, setting and definition of UTI

Clinical bottom line

Children who present with fever and who have positive dipstick testing for leucocyte esterase and nitrite should be given antibiotics and referred for further investigation. Dipstick testing would appear to have the sensitivity for

children with negative testing to be discharged, with the urine being sent for Gram stain and culture the following day rather than arranging urgent microscopy.

1 Gorelick MH, Shaw KN. Screening tests for urinary tract infection in children: a meta-analysis. *Pediatrics* 1999; 104:e54.

Intramuscular piroxicam or intramuscular diclofenac for renal colic

Report by Russell Boyd, *Consultant in Emergency Medicine*

Checked by Polly Terry, *Specialist Registrar in Emergency Medicine*

Clinical scenario

A 35 year old man presents to the emergency department with acute renal colic proven on urine dipstick analysis and urgent IVU. His pain is severe and you would like to give him IM diclofenac as he is vomiting and it is your current practice. He tells you he developed a sterile abscess last time he was given IM diclofenac. You wonder if an alternative NSAID, piroxicam, given by the IM route would be as effective as the diclofenac you are reluctant to give.

Three part question

[In renal colic] is [IM piroxicam or IM diclofenac] better [at reducing pain]?

Search strategy

Medline 1966–08/01 using the OVID interface. [exp piroxicam/ OR piroxicam.mp OR

feldene.mp] AND [exp diclofenac/ OR diclofenac.mp OR voltarol.mp] AND [exp kidney calculi/ OR exp Ureteral calculi/ OR renal colic.mp]

Search outcome

Two papers were identified of which one was relevant (table 2).

Comment(s)

Both forms of IM NSAID work well with some small advantage in favour of piroxicam in terms of pain relief at 30 minutes. IM voltarol has several notable administration problems that piroxicam does not.

Clinical bottom line

IM piroxicam appears to perform better than IM diclofenac for renal colic pain relief. Given it has fewer injection site side effects IM piroxicam should replace IM diclofenac for renal colic.

1 Al-Waili NS and Saloom KY. Intramuscular piroxicam versus intramuscular diclofenac sodium in the treatment of acute renal colic: double-blind study. *European Journal of Medical Research* 1999;4:23–6.

Table 2

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Al-Waili NS and Saloom KY, 1999, Germany	64 patients with proven diagnosis of renal colic on IVU, USS and clinical examination Those taking NSAIDS or pethidine on long term basis excluded	Double blind randomised controlled study	Change in mean pain scores at 30 and 60 minutes post administration of 75 mg IM diclofenac or 40 mg IM piroxicam as measured on a Visual Analogue 10 cm line	Both treatments dramatically decreased pain scores by 30 minutes. Diclofenac pre-treatment score 7.83 and 30 minutes post treatment 1.47; piroxicam pre-treatment score 7.41 with 30 minutes post treatment score 0.84. There was a significant improvement in favour of piroxicam for pain relief at 30 minutes (<i>t</i> test of means <i>p</i> <0.05)	The blinding mechanism is not given Uncertain of sampling method

Oral (fast dissolving) piroxicam or intramuscular diclofenac for renal colic

Report by Russell Boyd, *Consultant in Emergency Medicine*

Checked by Polly Terry, *Specialist Registrar in Emergency Medicine*

Clinical scenario

You have just seen a patient with presumed renal colic. You have prescribed a dose of IM diclofenac as per departmental policy but wonder if a newer fast dissolving oral piroxicam agent would be as effective as the usual parenteral diclofenac agent.

Table 3

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Supervia A <i>et al</i> , Spain, 1998	80 sequential patients with a clinical diagnosis of renal colic confirmed by either urine analysis or ultrasound.	Double blind randomised controlled trial	Pain as measured by visual analogue score at 30 minutes	Both treatments significantly reduced pain scores at 30 minutes post administration. No significant difference evident between treatments in terms of efficacy of pain relief.	Relatively small numbers with no power study so possible type II error.

Three part question

In [renal colic] is [oral fast dissolving piroxicam or IM diclofenac] better [at reducing pain]?

Search strategy

Medline 1966–08/01 using the OVID interface. [exp Diclofenac/ OR exp diclofenac sodium/ OR diclofenac.mp OR voltarol.mp] AND [exp piroxicam/ OR piroxicam.mp OR feldene.mp] AND [renal colic.mp OR exp ureteral calculi/ OR exp renal calculi]

Search outcome

Two papers were identified of which one was found to be relevant (table 3).

Comment(s)

A fast dissolving NSAID preparation of piroxicam seems effective at relieving renal colic pain and appears as effective as the standard diclofenac IM treatment in terms of speed to onset and relief of pain intensity. In terms of patient acceptability and ease of administration the oral format would intuitively seem to have advantages.

Clinical bottom line

There is reasonable evidence to suggest the use of oral fast dissolving piroxicam is as effective as IM diclofenac.

1 Supervia A, Pedro-Botet J, Nogues X, *et al*. Piroxicam fast-dissolving dosage form vs diclofenac sodium in the treatment of acute renal colic: a double-blind controlled trial. *Br J Urol* 1998;**81**:27–30.

NIPPV for acute cardiogenic pulmonary oedema

Report by Rupert Jackson, *Specialist Registrar in Emergency Medicine*

Checked by Steve Jones, *Specialist Registrar in Emergency Medicine*

Clinical scenario

A 76 year old man is brought in to the emergency department in a collapsed state. He has a history of ischaemic heart disease. He is agitated, tachypnoeic and sweating profusely. His neck veins are distended and there are widespread coarse crepitations in his chest. He

has a diminished oxygen saturation. You make a clinical diagnosis of acute cardiogenic pulmonary oedema. In addition to vasodilator treatment and opioids, you wonder whether you should administer non-invasive positive pressure ventilation (NIPPV).

Three part question

In [patients with acute LVF] is [NIPPV better than alternative treatment strategies] at [avoiding intubation and improving mortality]?

Search strategy

Medline 1966–08/01 using the OVID interface. [exp pulmonary edema/ or “pulmonary

Table 4

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Mehta S <i>et al</i> , 1997, USA	27 patients with ACPO	Prospective randomised controlled trial	Clinical variables	BP and PaCO ₂ lower in NIPPV group (p<0.05)	Small numbers
	NIPPV v CPAP		Incidence of myocardial infarction	10/14 in NIPPV group v 4/13 with CPAP (p=0.05)	Study stopped early due to MI differences
Sharon A <i>et al</i> , 2000, Israel	40 patients with ACPO	Prospective randomised controlled trial	Length of ICU/hospital stay, intubation rates, mortality	N/S differences between groups	NIPPV had more chest pain at baseline
	NIPPV and low dose nitrates v high dose nitrates alone		Mortality	2/20 in NIPPV group v 0/20 (N/S)	No power calculation
Masip J <i>et al</i> , 2000, Spain	40 patients with ACPO	PRCT	Intubation rate	16/20 in NIPPV group v 2/20 (p=0.0004)	Study stopped early due to differences in rate of intubation
	NIPPV v O ₂		Incidence of myocardial infarction	11/20 in NIPPV group v 2/20 (p=0.006)	Pre-hospital setting
Park M <i>et al</i> , 2001, Brazil	26 patients with ACPO	PRCT	SaO ₂ , pulse and respiratory rates	Improvement significantly slower with NIPPV	Not analysed on basis of intention to treat
	O ₂ v BiPAP v CPAP		Mortality	Control 2/18	Small numbers with likely effect of underpowered study
			Intubation	Intervention 0/18	
				Control 6/18	
			Hospital stay	Intervention 1/19 (P=0.04)	
			Clinical variables (for example, RR, HR, etc)	No significant difference between groups	
			Intubation	No difference at 60 mins	
				O ₂ —4/10	
			Death	CPAP—3/9	
				BiPAP—0/7	
				O ₂ —0	
				CPAP—1 (day 3)	
				BiPAP—0	