

Table 2

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Struijs <i>et al</i> , 2002, Holland	5 RCTs N=109	Cochrane review	Pain	Not statistically significant on short term pain relief	Low power
	3 of these used epicondyle clasp/bandage as addition to physiotherapy treatment		Elbow function/grip strength/painfree grip/global improvement/. lateral epicondyle pressure pain	All studies low power. Impossible to make definite conclusions	
Struijs <i>et al</i> , 2004, Holland	N=180	RCT	8 outcomes scoring pain all based on 100 point numerical scale at 6 weeks	N=176 Contradictory results at 6 weeks; combination therapy better than brace-only in 3 outcomes (pain main complaint, inconvenience and severity of complaint) but worse in 1 (abilities of daily living). Combination better than physio alone in 1 outcome (increase in pressure pain threshold). These were significant at $p<0.05$, but showed wide confidence intervals.	Condition only 6 weeks old.
	Clinical diagnosis of 6 weeks lateral epicondylitis		At 6 months	not statistically significant	No control group
	3 Groups;		At 1 year	not statistically significant	No statistical adjustment for multiple analyses.
	i. physiotherapy				Exercise regime not supervised (?compliance)
	ii. clasp only				
	iii. clasp and physio combined				

RCT, randomised controlled trial

► CLINICAL BOTTOM LINE

There is some weak evidence that any improvement seems to occur soon after the clasp is applied, but this is not maintained after 6 months and 1 year follow up

Struijs PAPA, Arola H, Assendelft WJJ, *et al*. Orthotic devices for the treatment of tennis elbow. *The Cochrane Database of Systematic Reviews* 2002, Issue 1. Art. No.: CD001821. DOI: 10.1002/14651858.CD001821.

Struijs PA, Kerkhoffs GM, Assendelft WJ, *et al*. Conservative treatment of lateral epicondylitis: brace versus physical therapy or a combination of both—a randomized clinical trial. *American Journal of Sports Medicine* 2004 Mar;32(2):462–9.

Chlorpromazine in migraine

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Search checked by David Lewis, Consultant in Emergency Medicine

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A short cut review was carried out to establish whether there is any evidence that chlorpromazine is an effective treatment for migraine. 81 papers were found using the reported search, of which eight answered the clinical question. The authors, patient groups, outcomes results and key weaknesses of this evidence are presented. The clinical bottom line is that a regime of prophylactic intravenous normal saline and intramuscular or intravenous chlorpromazine appears to have superior efficacy to pethidine, lignocaine or ergot derivatives, and similar efficacy to ketorolac, metoclopramide or sumatriptan for the abolition of the pain of migraine headache.

Three part question

In [patients with migraine headache] is [chlorpromazine as effective as standard treatments] at [resolving pain]?

Clinical scenario

A 38-year-old female with a history of regular migraine headache since her teenage years presents to your Emergency Department with a classic history of migraine symptoms. She has tried simple over the counter analgesia, as well as her prescription medication, a triptan, with no effect. You have heard of chlorpromazine being used in the abolition of migraine attacks, but are unsure of its relative efficacy compared to other standard treatments.

Search strategy

Medline OVID interface. 1966–30th Jan 2007

Cochrane Database of Systematic Reviews. 4th Quarter 2006
Cochrane Central Register of Controlled Trials. 1st Quarter 2007-01-31

CINAHL. 1982- December Week 2 2006

ACP Journal Club. 1991-January/February 2007

EMBASE. 1966-30th Jan 2007-01-31

[phenothiazines OR chlorpromazine] AND [migraine OR vascular headache]

LIMIT to English Language and Human

Search outcome

A total 81 papers were found in Medline, of which eight are directly relevant to the question. No further papers were obtained by searching Cochrane, CINAHL, EMBASE or ACPJC.

Comment(s)

Fear of significant side effects from chlorpromazine appear to be unfounded. There was no incidence of symptomatic postural hypotension in studies which patients received prophylactic intravenous normal saline prior to chlorpromazine administration, and no dystonic reactions were reported in any study. Drowsiness is, however, frequently reported. Chlorpromazine also seems to be efficacious whether given via the intramuscular or intravenous route.

Table 3

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Iserson, 1983, USA	100 patients with symptoms and signs from predefined "Vascular Cephalgia" presenting to an ED 1 mg/kg IM Chlorpromazine (Max 100 mg) to all patients	Non blinded non randomised uncontrolled trial	Complete resolution of headache, nausea and vomiting	96 Patients (96%)	Non blinded
McEwen <i>et al</i> , 1987, Canada	36 patients under 60 years meeting proprietary migraine definition criteria presenting to an ED 1 mg/kg IM Chlorpromazine vs. Placebo	Double blinded randomised controlled trial	Mean time to symptom relief Headache recurrence within 48 h Symptomatic orthostatic hypotension Proprietary scale of symptomatic relief	35 mins (Range 20–55 mins) 4 patients (4%) 11 patients (11%) 10 patients (53%) Chlorpromazine vs 13 patients (76%) placebo p=0.187	Open label study Exact number of exclusions unclear Straw Man Comparison
Lane <i>et al</i> , 1989, Canada	46 patients diagnosed by ED physician with common or classic migraine	Double blind randomised comparison trial	Not improved enough to return to activities of daily living Improved enough to return to activities of daily living At least some improvement in Headache Improvement in nausea Side effects Drowsiness Asymptomatic Postural Hypotension Mean decrease in 10 cm Visual Analogue Pain Score	9 patients (47%) Chlorpromazine vs 4 patients (24%) placebo. p=0.187 16 Patients (84%) Chlorpromazine vs 6 Patients (35%) Placebo p=0.004 15 Patients (88%) Chlorpromazine vs 4 patients (29%) Placebo p<0.001 15 patients (88%) p=0.009 10 patients (53%) p=0.032	Subsequently indulges in post hoc analysis
Bell <i>et al</i> , 1990, Canada	25 mg IV Chlorpromazine and 10 ml Normal Saline plus up to 2 repeat doses of 0.1 mg/kg IV Chlorpromazine vs. 100 mg Pethidine and 50 mg dimethylhydrate plus up to 2 repeat doses. Other study drug used for rescue analgesia if treatment failure at 45 mins 76 adult patients under 60 years meeting proprietary migraine definition criteria presenting to 2 EDs IV Dihydroergotamine 1 mg repeated if necessary at 30 mins vs IV Lignocaine 50 mg at 20 min intervals (max 3 times) vs IV Chlorpromazine 12.5 mg at 20 min intervals (max 3 doses) All patients pretreated with 500 ml IV normal Saline	Single blinded randomised comparison trial	Reduction in median headache intensity (Verbal 1–10 scale) Persistent relief at 24 hr telephone follow up	–7.06 (SD 2.18) Chlorpromazine vs –4.45 (SD 2.62) Pethidine/ Dimethylhydrate p<0.001 2 patients (8%) Chlorpromazine group vs 10 patients (45%) Pethidine/ Dimethylhydrate group p<0.01	Relatively small sample size
Cameron JD <i>et al</i> , 1994, Canada	91 adult patients under age 60 yrs diagnosed with migraine headache by ED physician 0.1 mg/kg IV Chlorpromazine vs 0.1 mg/kg IV Metoclopramide, both to max. 3 doses 5 ml/kg IV Normal Saline to all patients	Double blinded randomised comparison trial	Mean change in 10 cm visual analogue score at discharge	2.75 (36.7%) Dihydroergotamine vs 4.00 (50%) Lignocaine vs 6.75 (79.5%) Chlorpromazine p<0.005 10 patients (52.6%) Dihydroergotamine vs 5 patients (29.4%) Lignocaine vs 16 Patients (88.9%) Chlorpromazine	Single blinded study
Shrestha <i>et al</i> , 1996, USA	30 adult patients under 65 years attending ED with headache meeting International Headache Association Criteria for Migraine without aura 25 mg IV Chlorpromazine vs 60 mg IM Ketorolac	Double Blinded Randomised Comparison Trial	Treatment failure requiring second drug Recurrence within 48 hrs at telephone follow up Mean (+/– SEM) Pain Score (Pictographic 0–5 Scale) decrease at 2 hrs	4.87 +/– 2.46 Chlorpromazine vs 4.34 +/– 2.85 p=0.35 9 (19%) Chlorpromazine vs 11 (25%) Metoclopramide p=0.50 21 (66%) Chlorpromazine vs 16 (55%) Metoclopramide p=0.28 3.6 +/– 0.4 (79% +/– 9%) Chlorpromazine vs 3.33 +/– 0.3 (80% +/– 7%) Ketorolac p=0.36	2 protocol violations in a non intention to treat study No formal entry criteria, simply clinical diagnosis of migraine Patients already taking NSAID not excluded

Table 3 Continued

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Kelly <i>et al</i> , 1997, Australia	500 ml IV normal Saline for every patient 43 adult patients under 65 years, features typical of migraine headache, past history of migraine and no impairment of conscious level 12.5 mg IV Chlorpromazine increments to max 37.5 mg vs 6 mg IM Sumatriptan All patients pretreated with 10 mg IV Metoclopramide and 1000 ml IV Normal Saline Patient crossover at 2 hrs if visual analogue pain score still > 3	Prospective randomised unblinded crossover trial	Percentage pain free at 1 hour	4 (18%) Chlorpromazine vs 2 (10%) Sumatriptan	
			Percentage pain free at 2 hours	9 (41%) Chlorpromazine vs 8 (42%) Sumatriptan	
			Percentage with relief of pain to patient's satisfaction	22 (95%) Chlorpromazine vs 19 (95%) Sumatriptan	
			Mild adverse events reported	3 (13%) Chlorpromazine vs 3 (15%) Sumatriptan	
Bigal <i>et al</i> , 2002, Brazil	68 adult patients diagnosed by International Headache Society criteria for Migraine with aura or Migraine without aura presenting to 2 ED's	Double blind randomised placebo controlled trial	Migraine without Aura	8 (21.1%) Chlorpromazine vs 1 (3.3%) placebo. P<0.01	Straw man comparison
			Absence of pain at 30 minutes	24 (63.2%) Chlorpromazine vs 3 (10%) placebo. p<0.01	Double blinding fatally flawed
			Absence of pain at 60 minutes	28 (73.7%) Chlorpromazine vs 14 (46.7%) placebo. p<0.01	Postural hypotension undefined
			Absence of pain at 24 h	11 (36.7%) Chlorpromazine vs 0 (0%) placebo. p<0.01	
			Migraine with Aura	20 (66.7%) Chlorpromazine vs 2 (6.7%) placebo. p<0.01	
			Absence of pain at 30 minutes	27 (90%) Chlorpromazine vs 22 (73.3%) placebo. p<0.05	
			Absence of pain at 60 minutes	1 (1.4%) Chlorpromazine vs 10 (16.7%) placebo. p<0.05	
			Absence of pain at 24 hours	9 (13.2%) Chlorpromazine vs 1 (1.6%) placebo. p<0.05	
			Adverse events	24 (35.2%) Chlorpromazine vs 10 (16.7%) placebo. p<0.05	
			Nausea	1 (1.4%) Chlorpromazine vs 10 (16.7%) placebo. p<0.05	
			Postural hypotension		
			Drowsiness		
			Dyspepsia		

ED, emergency department; IM, intramuscular; IV, intravenous; NSAID, non-steroidal anti-inflammatory drug.

► CLINICAL BOTTOM LINE

A regime of prophylactic intravenous normal saline and intramuscular or intravenous chlorpromazine appears to have superior efficacy to pethidine, lignocaine or ergot derivatives, and similar efficacy to ketorolac, metoclopramide or sumatriptan for the abolition of the pain of migraine headache.

Iserson KV. Parenteral chlorpromazine treatment of migraine. *Annals of Emergency Medicine* 1983;**12**:756–8.

McEwen JI, O'Connor HM, Dinsdale HB. Treatment of migraine with intramuscular chlorpromazine. *Annals of Emergency Medicine* 1987;**16**:758–63.

Lane PL, McLellan BA, Baggoley CJ. Comparative efficacy of chlorpromazine and meperidine with dimenhydrinate in migraine headache. *Annals of Emergency Medicine* 1989;**18**:360–5.

Bell R, Montoya D, Shuaib A, *et al.* A comparative trial of three agents in the treatment of acute migraine headache. *Annals of Emergency Medicine* 1990 Oct;**19**:1079–82.

Cameron JD, Lane PL, Speechley M. Intravenous chlorpromazine vs intravenous metoclopramide in acute migraine headache. *Academic Emergency Medicine* 1995;**2**:597–602.

Shrestha M, Singh R, Moreden J, *et al.* Ketorolac vs chlorpromazine in the treatment of acute migraine without aura. A prospective, randomized, double-blind trial. *Archives of Internal Medicine* 1996;**156**:1725–8.

Kelly AM, Ardagh M, Curry C, *et al.* Zebic S. Intravenous chlorpromazine versus intramuscular sumatriptan for acute migraine. *Journal of Accident & Emergency Medicine* 1997;**14**:209–11.

Bigal ME, Bordini CA, Speciali JG. Intravenous chlorpromazine in the emergency department treatment of migraines: a randomized controlled trial. *Journal of Emergency Medicine* 2002;**23**:141–8.

The use of intrapleural anaesthetic to reduce the pain of chest drain insertion

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A short cut review was carried out to establish whether there is any evidence that intrapleural anaesthetic is effective in relieving pain in patients with chest drains. 190 papers were found using the reported search, of which two answered the

clinical question. The authors, patient groups, outcomes results and key weaknesses of this evidence are presented. The clinical bottom line is that intrapleural bupivacaine should be considered in patients who have chest drains inserted, in addition to their regular oral/parenteral analgesia.

Clinical scenario

A 25-year-old male with a history of spontaneous pneumothorax presents to the emergency department with a further large pneumothorax. Unfortunately, attempted aspiration fails due to a permanent leak, and he requires an intercostal drain. He has had a chest drain inserted in the past and admits that it was very painful whilst the drain was in situ. You wonder whether administration of local anaesthetic down the tube would provide good analgesia, and decrease the need for oral/or intravenous medications.

Three part question

[After insertion of a chest drain] does [the use of local anaesthetic down the drain] reduce [patient's pain]?

Search strategy

Medline Ovid Interface 1966–Aug 2006

exp Anesthetics, local/OR local anaesth\$.mp. OR exp lignocaine/OR bupivacaine.mp. OR marcain.mp. OR lignocaine.mp. OR lidocaine.mp. OR exp lidocaine/OR (local adj5 anaesthetic).mp. AND chest drain.mp. OR intercostal drain.mp. OR chest tube.mp. OR exp chest tubes/OR exp drainage/OR exp thoracostomy/limit to English and humans

Search outcome

A total of 190 articles found, of which one was relevant.

Comment(s)

Patients with indwelling chest drains may have severe pain and require oral or intravenous analgesia including opiates. There has been much research on the use of intrapleural analgesia after chest trauma and thoracostomy, but only one study which looks at the use of intrapleural analgesia solely for the relief of pain from the indwelling drain.

Although the number of patients is small, it seems to suggest that there may be a role for intrapleural analgesia in this subset of patients. No side effects of treatment were noted.

Table 4

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Engdahl <i>et al</i> , 1993, Sweden	22 patients with indwelling chest drains – 8 hourly boluses of 20 ml interpleural bupivacaine with 0.5% adrenaline, compared with placebo - visual analogue scale scores compared	Randomised double blind trial	VAS scores after 1st injection (exclude pt 2)	Lower in bupivacaine group at 5,15, 30 and 60 min p<0.01	Small study
			VAS score 4 hrs post 1st injection	No difference between groups	8 hours between boluses though bupivacaine is relatively short acting
			VAS scores after injections 2–10	Only significant difference in favour of bupivacaine at 5 mins post 2nd injection, and post 7th injection, otherwise pain VAS comparable	Timing of 1st intrapleural injection not standardised – “at 4 hrs or earlier if in severe pain”
			Use of intravenous morphine	Not significant, though tended to be asked for earlier in control group	
			Use of oral analgesia	No difference in consumption	

VAS, visual analogue score