ARCHIMEDES

Towards evidence based medicine for paediatricians

Edited by Bob Phillips

Arch Dis Child 2004;**89**:683–688. doi: 10.1136/adc.2004.055343

In order to give the best care to patients and families, paediatricians need to integrate the highest quality scientific evidence with clinical expertise and the opinions of the family.[1] *Archimedes* seeks to assist practising clinicians by providing ''evidence based'' answers to common questions which are not at the forefront of research but are at the core of practice. In doing this, we are adapting a format which has been successfully developed by Kevin Macaway-Jones and the group at the *Emergency Medicine Journal*—''BestBets''.

A word of warning. The topic summaries are not systematic reviews, through they are as exhaustive as a practising clinician can produce. They make no attempt to statistically aggregate the data, nor search the grey, unpublished literature. What *Archimedes* offers are practical, best evidence based answers to practical, clinical questions.

The format of *Archimedes* may be familiar. A description of the clinical setting is followed by a structured clinical question. (These aid in focusing the mind, assisting searching,[2] and gaining answers.[3]) A brief report of the search used follows—this has been performed in a hierarchical way, to search for the best quality evidence to answer the question.[4] A table provides a summary of the evidence and key points of the critical appraisal. For further information on critical appraisal, and the measures of effect (such as number needed to treat, NNT) books by Sackett[5] and Moyer[6] may help. To pull the information together, a commentary is provided. But to make it all much more accessible, a box provides the clinical bottom lines.

The electronic edition of this journal contains extra information to each of the published *Archimedes* topics. The papers summarised in tables are linked, by an interactive table, to more detailed appraisals of the studies. Updates to previously published topics will be linked to the original article when they are available.

Electronic-only topics that have been published on the BestBets site (www.bestbets.org) and may be of interest to paediatricians include:

- Is two thumb or two finger compression better in rescuscitating infants who have sustained a cardiac arrest?
- Is buccal midazolam an effective alternative to rectal midazolam in the treatment of status epilepticus?

Readers wishing to submit their own questions—with best evidence answers—are encouraged to review those already proposed at www.bestbets.org. If your question still hasn't been answered, feel free to submit your summary according to the Instructions for Authors at www.archdischild.com. Three topics are covered in this issue of the journal.

- Do pizotifen or propranolol reduce the frequency of migraine headache?
- Are anticonvulsants a satisfactory alternative to opiate analgesia in patients experiencing pain with Guillain-Barré syndrome?
- Is transcatheter device occlusion as good as open heart surgery for closure of atrial septal defects?

Putting evidence into practice: part 1

Journal clubs are probably the easiest place to get evidence based medicine (EBM) started. Most attendees will be familiar with this being a place for examining papers, and it might even have a regular slot on the timetable. We've found that converting a traditional journal club to an evidence-based one improved attendance and interest in the event.[1] It seems to have a lasting effect too, with ex-club members recalling the principles of EBM and the key points of critical appraisal two years after leaving the hospital (L Etheridge and H Jepps, personal communication).

An evidence based journal club is split into three uneven sections (when it's up and running). A question is devised one week, its search results looked at the next, and the week after sees an analysis of the best paper(s). In each session, the first five minutes are used to review the results of a search, and a paper selected. The next 40–45 minutes are used to discuss a paper, and the last 5–10 minutes are used to identify and clarify a clinical question to roll onwards. In the first few weeks, teaching papers and ''planted'' questions can be used to get the principles in place. It also helps if the group leader can make sure that the initial questions being asked are likely to have an answer—it can be highly dispiriting to have a three week run of ''no evidence for this question''.[2] The problems you are likely to face when doing this include:

- Lack of answers to the questions asked.
- Research nihilism—no paper is perfect so no answer can be given.
- Access to papers upsetting your timetable.
- Staff changes and revisiting the basics.

The best defences to these problems are encapsulated by Baden-Powell's motto: ''Be prepared''. Have to hand the idea that only about 1/9 questions will have a decent answer; and have a few questions up your sleeve to tickle people with. Push the idea of ''how good is the study'' rather than ''how poor is the study''. Keep a store of papers you'd use for teaching to fill in awkward gaps, and to broaden your understanding of other sorts of studies. (You'll probably find you get lots and lots of therapeutic questions and not very many diagnostic, prognostic, or aetiologic ones.) And to get around the problem of staff changing, try to empower the group to teach itself as it goes along.

References

1 Phillips RS, Buttery J, Collins C. Journal clubs. *Acta Paediatr* 2001;**90**:592.
2 Rudolf M, Rowland G, Das G, *et al*. What's the use of Archimedes? *Arch Dis Child* 2002;**87**:168–9.

Bob Phillips, Evidence-based On Call, Centre for Evidence-based Medicine, University Dept of Psychiatry, Warneford Hospital, Headington OX3 7JX, UK;
bob.phillips@doctors.org.uk

REFERENCES

1 **Moyer VA,** Ellior EJ. Preface. In: Moyer VA, Elliott EJ, Davis RL, *et al*, eds. *Evidence based pediatrics and child health*, Issue 1. London: BMJ Books, 2000.

2 **Richardson WS,** Wilson MC, Nishikawa J, *et al*. The well-built clinical question: a key to evidence-based decisions. *ACP J Club* 1995;**123**:A12–13.
3 **Bergus GR,** Randall CS, Sinift SD, *et al*. Does the structure of clinical questions affect the outcome of curbside consultations with specialty colleagues? *Arch Fam Med* 2000;**9**:541-7.
4 http://cebm.jr2.ox.ac.uk/docs/levels.htm (accessed July 2002).
5 **Sackett DL,** Starus S, Richardson WS, *et al*. *Evidence-based medicine. How to practice and teach EBM*. San Diego: Harcourt-Brace, 2000.
6 **Moyer VA,** Elliott EJ, Davis RL, *et al*, eds. *Evidence based pediatrics and child health*, Issue 1. London: BMJ Books, 2000.

Additional information on each of the topics is available on the *ADC* website (www.archdischild.com/supplemental)

Do pizotifen or propranolol reduce the frequency of migraine headache?

Report by
N Barnes, *Specialist Registrar, John Radcliffe Hospital, Oxford, UK; nickbarnesten@yahoo.co.uk*
G Millman, *Specialist Registrar, Royal Manchester Children's Hospital, Manchester, UK*
doi: 10.1136/adc.2004.054668

Once again you find yourself in a busy general paediatric clinic faced with a 14 year old girl suffering from recurrent headaches for the past nine months. The history would suggest frequent attacks of a migrainous nature without aura. There is a positive family history in both parents and a sibling, but no obvious precipitating factors. The attacks are now occurring weekly and interfering with normal activities, especially school attendance. She is due to start GCSE coursework soon and both her and her parents are very keen to try a preventative medication. Her neurological examination is normal. They would like her on pizotifen or propranolol as these have helped other family members in the past. She is not asthmatic and otherwise healthy.

Structured clinical question

In an adolescent with frequent migrainous headache [patient] does the prescription of pizotifen or propranolol [intervention] reduce the frequency and/or the severity of migraine attacks [outcome]?

Search strategy and outcome

The data were derived from the results of a search carried out in 2003 by an information specialist at *Clinical Evidence*.

Secondary sources: The Cochrane Library, Issue 4, 2003—one relevant review found.[1]

Primary sources: Medline 1966 to date, Embase 1980 to date, Psycinfo 1980 to date. The search terms used were: migraine AND child OR infant OR pediatric OR paediatric OR schoolchild OR teen OR teenager OR adolescent. This strategy yielded 36 systematic reviews and a further 51 randomised controlled trials. The majority were excluded as they were either irrelevant or of poor quality, leaving just five articles (see tables 1 and 2).

Commentary

Studies in the developed world suggest that migraine is the commonest diagnosis among children presenting to a medical practitioner with headache. There are well defined diagnostic criteria laid down by the International Headache Society.[2] Girls and boys are affected equally before puberty, but thereafter girls are more likely to suffer migraine.[2–4] Propranolol and pizotifen are widely prescribed by paediatricians as prophylactic agents.

No systematic reviews were available on the use of β blockers, though three RCTs with conflicting results were identified which compared propranolol with placebo. Ludviggson[5] showed in 32 children aged 7–16 years that propranolol (60–120 mg in three divided doses) produced a significant increase in the perception of benefit compared with placebo. Forsythe and colleagues[6] showed that propranolol (40–120 mg daily) actually increased headache duration compared with placebo in 53 children aged 9–15 years. Olness and colleagues[7] found no significant difference in the number of migraine attacks between propranolol (3 mg/kg per day) and placebo in 33 children aged 6–12 years. No significant harmful side effects were reported in any of these patient groups. All three studies had methodological flaws, and all, because of their small size, probably lacked the power to exclude clinically important differences and to yield important information about harms. The interpretation of post-crossover results in these three RCTs is unreliable

Table 1 The use of propranolol as migraine prophylaxis

Citation	Study group	Study type (level of evidence)	Outcome	Key results	Comments
Ludviggson (1974), Sweden	32 children with IHS-congruent migraine (aged 7–16 years) Propranolol 60–120 mg daily divided in 3 doses *v* placebo, 3/12 period	Double-blind, crossover RCT (level 2c)	Increased perception of benefit of propranolol *v* placebo	Pre-crossover results: 13/13 (100%) improved with propranolol *v* 4/15(27%) with placebo; $p<0.001$; NNT = 1.4	Reliability may be limited because very small trial with 13% of children lost to follow-up
Forsythe *et al* (1984), UK	53 children with IHS-congruent migraine (aged 9–15 years) Propranolol 40–120 mg daily *v* placebo, 30 week period	Double-blind, crossover RCT (level 2c)	Propranolol significantly increased headache duration compared with placebo	Pre-crossover results: mean duration of headache: 436 minutes with propranolol *v* 287 minutes with placebo, $p<0.01$	Reliability may be limited because only 74% of children completed the study
Olness *et al* (1987), USA	33 children with IHS-congruent migraine (aged 6–12 years) Propranolol 3 mg/kg/day *v* placebo, 3/12 period	Double-blind, crossover RCT (level 2c)	No significant difference in the number of episodes of migraine between propranolol and placebo at 3/12	Pre-crossover results Mean number of headaches: propranolol 14.9 (95% CI 2, 27.8) *v* placebo 13.3 (95% CI 3.8, 22.8), p = 0.47	Confounding effect: In five participants in whom migraine was thought to be provoked by food, diet was restricted to avoid these foods Reliability also limited by 15% drop-out rate