Static magnets for reducing pain: systematic review and meta-analysis of randomized trials

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CRD summary
This review concluded that there was no evidence to support the use of static magnets for pain relief. This was a generally well-conducted review and the authors drew appropriate conservative conclusions given the limitations of the available evidence.

Authors' objectives
To assess the effectiveness of static magnets for treating pain.

Searching
MEDLINE, EMBASE, AMED, CINAHL, Scopus, The Cochrane Library and the UK National Research Register were searched from inception to March 2007 for studies in any language; search terms were reported. The bibliographies of retrieved articles, conference proceedings, three medical journals and the authors' personal collection of papers were searched.

Study selection
Randomised controlled trials (RCTs) of magnets described as static or permanent compared to nonmagnetic placebo or a device with weak magnetic field strength that reported pain outcomes were eligible for inclusion regardless of the cause of pain. The primary pain outcome was the change from baseline on a 100mm visual analogue scale (VAS); a range of other scales were used in the studies. The population studied, site and cause of pain and intervention utilised varied considerably across studies. The age of participants ranged from 18 to 85 years. Titles and abstracts were independently assessed; it was unclear whether full papers were screened in duplicate.

Assessment of study quality
Study quality was evaluated independently by two reviewers using the Jadad scale with an additional criteria for allocation concealment. Differences were resolved by consensus.

Data extraction
The mean change in pain scale score from baseline and 95% confidence intervals (CI) were calculated for each study. Authors were contacted for missing data. Data were extracted by two independent reviewers with differences being resolved by discussion.

Methods of synthesis
The standardised or weighted mean differences in pain score and 95% CI were calculated using a random-effects model. Heterogeneity was assessed using the Chi^2 and I^2 tests. Publication bias was assessed using funnel plots. Post hoc sensitivity analyses were performed to determine the effect of the duration of the trial and the type of pain.

Results of the review
Sixteen trials were included in the review (n= 1,196; range 20 to 259). All were described as double blind, but only six described adequate allocation concealment. Six studies scored 5 on the Jadad scale, six scored 4, two scored 3, and two scored 2. There was a small but significant effect of magnets when results from all 16 trials are pooled regardless of scale (standardised mean difference was 0.23mm, 95% CI: 0.04 to 0.42, p=0.02), however, statistically significant heterogeneity was observed (p=0.009, 51.2%). There was no significant reduction in pain with magnet therapy compared to placebo when measured on a 100mm visual analogue scale when studies of patients with musculoskeletal pain who received an intervention for two to four months or when data from longer-term trials were analysed separately. Three out of four trials reported positive effects of magnets for the treatment of pain due to osteoarthritis; no consistent benefits were reported in trials for other subgroups presented. The test for publication bias was considered inconclusive.

Authors' conclusions
There was no evidence to support the use of static magnets for pain relief.

**CRD commentary**

The authors addressed a clear research question using appropriate inclusion criteria. A comprehensive search was undertaken, but publication bias could not be ruled out. It seemed that the review process was conducted in duplicate, which reduced the risk of error and bias. Validity was assessed using appropriate criteria. The authors pooled studies that exhibited both clinical and statistical heterogeneity. Heterogeneity was investigated, but the sensitivity analyses conducted were post hoc. Most of the studies were small (less than 50 patients) and many did not describe a method for allocation concealment. This was a generally well-conducted review and the authors drew appropriate conservative conclusions given the limitations of the available evidence.

**Implications of the review for practice and research**

**Practice:** The authors stated that static magnets could not be recommended as an effective treatment for pain.

**Research:** The authors stated that future studies should be adequately powered with a well-defined patient population and give consideration to the design of the placebo or sham treatment.

**Funding**

None reported.

**Bibliographic details**


**PubMedID**
17893349

**DOI**

**Original Paper URL**
http://www.cmaj.ca/cgi/content/full/177/7/736

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Humans; Magnetics /therapeutic use; Pain Management; Pain Measurement; Randomized Controlled Trials as Topic

**AccessionNumber**
12008008136

**Date bibliographic record published**
30/09/2008

**Date abstract record published**
02/09/2009

**Record Status**

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