Does bed rest after cervical or lumbar puncture prevent headache: a systematic review and meta-analysis

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Authors' objectives
To assess whether longer bed rest is better than immediate mobilisation or short bed rest in preventing headache after cervical or lumbar puncture.

Searching
EMBASE (from 1988 to March 2001), MEDLINE (from 1966 to May 2001), Pascal Biomed (from 1996 to February 2001), Current Contents (from 1997 to September 1999), PsycINFO (from 1966 to May 2001) and the Cochrane Controlled Trial Register (May, 2001) were searched. The search strategy was ('headache', 'cephalea' or 'cephalalgia') AND ('bed rest', 'bedrest', 'bed-rest', 'posture', 'recumbency' or 'recumb*') AND ('lumbar', 'postlumbar', 'spinal', 'dural', 'puncture', 'punct*' or 'post-punct*') AND ('randomised', 'randomized' or 'randomi*'). The authors also searched textbooks and references from retrieved papers. They did not search for unpublished studies. There were no language restrictions.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were included.

Specific interventions included in the review
Studies were eligible for inclusion if the patients were assigned to either a long or short period of bed rest. There were no restrictions in terms of the absolute duration of bed rest. Of the included studies, the majority compared immediate mobilisation with bed rest (from 30 minutes to 24 hours), while the rest compared a short period of bed rest (30 minutes to 8 hours) with a longer period (4 to 24 hours).

Participants included in the review
Studies were eligible for inclusion if the patients underwent lumbar or cervical puncture for any reason. Where reported, the participants were aged from 12 to 86 years.

Outcomes assessed in the review
To be eligible for inclusion, the studies had to report the occurrence of headache in absolute numbers.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The authors recorded whether the trial was reported according to the CONSORT criteria (see Other Publications of Related Interest no.1). A table of the quality of reporting is available on the Canadian Medical Association Journal (CMAJ) website. See Web Address at end of abstract. The authors do not explicitly state how many of the reviewers assessed the validity of the primary studies.

Data extraction
Two reviewers independently abstracted the data using a predefined form. The reviewers recorded data on the intervention, outcome, the reason for the lumbar or cervical puncture, age, gender, needle size and how the puncture was performed. The reviewers also recorded whether the outcome was specified as postpuncture headache, which was...
generally defined as a pain increase in the upright position and a decrease in the recumbent position. These and additional data from the original studies are available in tables available on the CMAJ website. See Web Address at end of abstract.

**Methods of synthesis**

**How were the studies combined?**

The authors pooled the data to determine relative risk (RR), along with a 95% confidence interval (CI), using a fixed-effect model. Publication bias was examined using a funnel plot, by linear regression analysis, and by applying the trim-and-fill method (see Other Publications of Related Interest no.2). The authors combined the studies according to the reasons for cervical or lumbar puncture: to administer anaesthesia, to perform myelography, and for diagnostic reasons.

**How were differences between studies investigated?**

The authors assessed statistical heterogeneity using a chi-squared statistic at a significance level of P less than 0.05. The authors also examined sources of clinical heterogeneity. A sensitivity analysis was conducted by examining publication bias (using the trim-and-fill method) in the anaesthesia and myelography groups, and by excluding one study (in which immediate mobilisation was compared with mobilisation after 30 minutes) in the diagnostic group.

**Results of the review**

Sixteen RCTs with 2,211 participants (1,083 assigned to immediate mobilisation or a short period of bed rest and 1,128 assigned to a longer period of bed rest) were included in the review.

In general, the quality of reporting was not satisfactory. The funnel plot showed that three studies (two in the anaesthesia group and one in the myelography group) were outliers.

**Anaesthesia:** this group of 5 trials demonstrated no statistical heterogeneity (chi-squared 3.7, d.f.=4, P=0.45). However, due to a high degree of clinical heterogeneity, a pooled analysis was not conducted. None of the studies showed that long bed rest was superior to immediate mobilisation or short bed rest. When the trim-and-fill method was used, the results indicated that the findings would be sensitive to publication bias, if present.

**Myelography:** there was no statistical heterogeneity in the 6 studies (chi-squared 6.3, d.f.=5, P=0.45). Assuming no clinical heterogeneity (there were insufficient data in the original studies), the pooled effect size indicated no benefit of bed rest over immediate mobilisation (RR 0.93, 95% CI: 0.81, 1.08). When the trim-and-fill method was applied, the pooled effect was only slightly reduced (RR 0.99, 95% CI: 0.86, 1.14), indicating that if publication bias were present, it most likely would not influence the findings.

**Diagnosis:** there was no statistical heterogeneity in the 5 trials (chi-squared 0.9, d.f.=4, P=0.93), and the participants were comparable in terms of their age and gender. There was no effect in favour of long bed rest compared to short bed rest (RR 0.97, 95% CI: 0.79, 1.19). The exclusion of one study (in which immediate mobilisation was compared with mobilisation after 30 minutes) from this analysis influenced the pooled effect size only marginally (RR 0.93, 95% CI: 0.69, 1.24).

**Authors' conclusions**

There was no evidence that longer bed rest after cervical or lumbar puncture was better than immediate mobilisation or short bed rest in reducing the incidence of headache after diagnostic puncture, myelography or spinal anaesthesia.

**CRD commentary**

The review question and the inclusion criteria were clearly stated. There was evidence of a substantial effort to search for all the relevant literature, with the exception that unpublished literature was not sought. It is possible, therefore, that some studies may have been missed. However, the authors addressed this issue in some detail. The quality of reporting was assessed using CONSORT criteria, although it was not explicitly stated how many of the reviewers were involved in the process. Additional tables containing detailed information on the included studies was available on the CMAJ database.
website, although a lot of data appears not to have been reported in the original studies. The authors appropriately
examined statistical and clinical heterogeneity before conducting meta-analyses.

The reviewers made conclusions regarding the effects of immediate mobilisation or short bed rest in comparison to long
bed rest. However, in one group of studies (the anaesthesia group), short bed rest was defined by up to 8 hours of rest
and long bed rest was defined as 24 hours, whereas in another group of studies (the diagnosis group), long bed rest was
as short as 30 minutes. Although the studies appear to have been summarised appropriately by group, the conclusions
should have addressed this discrepancy. Moreover, if the quality of the reporting was not satisfactory, the authors
should have been more cautious with their conclusions.

Implications of the review for practice and research
Practice: The authors state that there is no evidence that longer bed rest after cervical or lumbar puncture is better than
immediate mobilisation or short bed rest in reducing the incidence of headache.

Research: The authors did not state any implications for further research.

Bibliographic details
Thoennissen J, Herkner H, Lang W, Domanovits H, Laggner A N, Mullner M. Does bed rest after cervical or lumbar
puncture prevent headache: a systematic review and meta-analysis. CMAJ: Canadian Medical Association Journal 2001;
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Other publications of related interest
Sutton AJ, Duval SJ, Tweedie RL, Abrams KR, Jones DR. Empirical assessment of effect of publication bias on meta-

These additional published commentaries may also be of interest. Chessman A. Review: bed rest does not prevent
cervical or lumbar puncture headaches. ACP J Club 2002;137:24. McArthur JM. Review: longer bed rest does not
prevent more postpuncture headaches than immediate mobilisation or short bed rest. Evid Based Nurs 2002;5:87.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.