

TAKE-HOME MESSAGE

Neither bed rest nor fluid supplementation decreases the incidence of headache after dural puncture.

METHODS**DATA SOURCES**

Review authors searched the Cochrane Central Register of Controlled Trials, MEDLINE (1966 to February 2015), EMBASE (1974 to February 2015), and Literatura Latino Americana em Ciências da Saúde (LILACS) (inception to February 2015). Authors also hand searched reference lists from retrieved studies and the World Health Organization International Clinical Trials Registry platform (through February 2015).

STUDY SELECTION

Authors included randomized controlled trials of patients undergoing dural puncture that compared interventions to prevent post-dural puncture headache. Two authors independently reviewed studies with the Web-based Early Review Organizing Software. They retrieved the full text of studies identified as potentially eligible for meta-analysis inclusion in accordance with review of the title and abstract. A third study author resolved disagreements in regard to study inclusion.

DATA EXTRACTION AND SYNTHESIS

Two review authors used predesigned forms to extract study data, including participants, randomization methods, blinding, interventions, and outcomes. A third author resolved any data extraction discrepancies. The

Does Bed Rest or Fluid Supplementation Prevent Post-Dural Puncture Headache?**EBEM Commentators**

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Results

Summary results for the risk of post-dural puncture headache with bed rest or fluid supplementation.

Comparison	No. of Studies	No. of Participants	RR (95% CI)	I^2 , %
Bed rest vs immediate mobilization	12	1,519	1.24 (1.04–1.48)	0
Fluid supplementation vs no supplementation	1	100	1.00 (0.59–1.69)	NR

NR, Not reported.

The review included 24 trials with 2,996 participants. Of these, 12 trials provided moderate-quality evidence of increased incidence of post-dural puncture headache with bed rest compared with immediate mobilization (RR 1.24; 95% CI 1.04 to 1.48). Furthermore, 18 trials similarly provided moderate-quality evidence that bed rest increased incidence of any headache compared with immediate mobilization (RR 1.16; 95% CI 1.02 to 1.32). Subgroup analyses based on indication for dural puncture, including diagnostic lumbar puncture, myelography, and spinal anesthesia, found no decreased incidence of post-dural puncture headache with bed rest. An analysis restricted to 2 trials at low risk of bias also found no decreased

incidence of post-dural puncture headache with bed rest (RR 1.18; 95% CI 0.90 to 1.54).^{6,7} A single trial found that fluid supplementation does not decrease the incidence of post-dural puncture headache (RR 1.00; 95% CI 0.59 to 1.69).⁸

Commentary

Lumbar puncture is frequently performed in the emergency department setting. This procedure is a critical component of the diagnosis of disease processes requiring emergency intervention, including meningitis and subarachnoid hemorrhage. Unfortunately, post-dural puncture headache is a common complication of this procedure. It was first reported in 1898 by August Bier, and modern estimates place the

primary outcome was incidence of post-dural puncture headache, which is defined as a headache occurring within 5 days of dural puncture that worsens within 15 minutes after sitting or standing and improves within 15 minutes after lying supine.¹ Secondary outcomes included any headache subsequent to lumbar puncture to incorporate symptoms not categorized as post-dural puncture headache. Two authors independently assessed risk of bias according to the *Cochrane Handbook for Systematic Reviews of Interventions*² and rated overall evidence quality with the Grading of Recommendations Assessment, Development and Evaluation system.³ Authors assessed study heterogeneity with the I^2 statistic.^{4,5} They presented results as summary risk ratios (RRs) with 95% confidence intervals (CIs), using intention-to-treat analysis and a random-effects model. Authors performed subgroup analyses of studies stratified by indication for dural puncture and also performed an analysis restricted to trials determined to be at low risk of bias.

incidence of this complication as high as 30%. The cause proposed by Dr. Bier and still widely accepted by the contemporary medical community is persistent leak of cerebrospinal fluid through the puncture site.⁹ Historical teaching has been to reduce the incidence of post-dural puncture headache by bed rest after the procedure; this meta-analysis suggests that bed rest is ineffective.

These results are an update of a meta-analysis¹⁰ summarized in a previous Systematic Review Snapshot.¹¹ The previous meta-

analysis, based on 8 trials, similarly reported no benefit with bed rest versus early mobilization. The updated meta-analysis includes 4 additional studies assessing the effect of bed rest on the incidence of post-dural puncture headache, strengthening the evidence for no association. It further offers evidence from a single trial indicating no benefit to fluid supplementation for preventing post-dural puncture headache.

This meta-analysis does not include data for several alternative interventions reported by some studies to have efficacy in preventing post-dural puncture headache. A 2017 Cochrane review suggested that smaller needles or needles designed with atraumatic tips may be effective interventions for prevention of post-dural puncture headache, although incomplete methodology reporting precludes interpretation of the risk of bias for many of these studies.¹² Additionally, another meta-analysis reported that orientation of the bevel parallel to the longitudinal fibers of the dura when lumbar puncture is performed with a cutting needle may reduce the incidence of post-dural puncture headache, although this systematic review did not assess the study quality of the included studies.¹³ Finally, reinsertion of the stylet before removal of the needle may decrease the risk of subsequent headache.¹⁴ Ongoing study of these strategies will be useful to further assess the efficacy of these interventions, which show more promise than bed rest and fluid supplementation.

Editor's Note: This is a clinical synopsis, a regular feature of the *Annals'* Systematic Review Snapshot (SRS) series. The source for this systematic review snapshot is: **Arevalo-Rodriguez I, Ciapponi A, Roque I Figuls M, et al. Posture and fluids for preventing post-dural puncture headache. *Cochrane Database Syst Rev.* 2016;3:CD009199.**

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