



ELSEVIER

www.obstetanaesthesia.com

REVIEW ARTICLE

Insertion of an intrathecal catheter following accidental dural puncture: a meta-analysis

M. Heesen,^a S. Klöhr,^a R. Rossaint,^b M. Walters,^c S. Straube,^d M. van de Velde^c

^a Department of Anaesthesiology, Klinikum am Bruderwald, Bamberg, Germany

^b Department of Anaesthesiology, University Hospital Aachen, Aachen, Germany

^c Department of Anaesthesiology, University Hospital Gasthuisberg, Leuven, Belgium

^d Department of Occupational, Social and Environmental Medicine, University Medical Center Göttingen, Göttingen, Germany

ABSTRACT

Background: Inserting an intrathecal catheter after accidental dural puncture in parturients to prevent postdural puncture headache is becoming increasingly popular. We aimed to identify relevant published articles investigating this intervention and subject data to a meta-analysis.

Methods: A systematic literature search was performed, paralleled by a hand search of abstract publications. Studies that reported the dichotomous outcome parameters postdural puncture headache or need for an epidural blood patch were considered eligible. Risk ratios with 95% confidence intervals were calculated.

Results: We identified nine reports investigating placement of intrathecal catheters after accidental dural puncture. The risk ratio for an epidural blood patch after intrathecal catheter insertion was 0.64 (95% CI 0.49–0.84, $P = 0.001$). The risk ratio for postdural puncture headache was 0.82 (95% CI 0.67–1.01, $P = 0.06$).

Discussion: Inserting an intrathecal catheter significantly reduced the risk for an epidural blood patch; the incidence of postdural puncture headache was reduced but not significantly. Accidental dural puncture is a rare complication and therefore trials on intervention need to include a large number of patients which is time-consuming and costly. Intrathecal catheterisation is a promising approach for the prevention of postdural puncture headache and should be evaluated further. This intervention has additional benefits including a reduced risk of repeat dural puncture, rapid onset of action and use for anaesthesia.

© 2012 Elsevier Ltd. All rights reserved.

Keywords: Accidental dural puncture; Postdural puncture headache; Epidural blood patch; Intrathecal catheters

Introduction

Accidental dural puncture (ADP) is a complication of neuraxial blockade with the reported incidence in obstetric patients varying between 0 and 6.6%.^{1,2} Postdural puncture headache (PDPH) develops in approximately half of the cases of ADP.³ Numerous interventions for the management of ADP have been proposed.^{4,5} A prophylactic epidural blood patch (EBP) has been favoured by some authors but meta-analysis has not confirmed a positive effect, whereas a therapeutic EBP has been shown to be superior to conservative treatment.⁶ Among interventions considered following ADP is intrathecal insertion of the catheter at the time of the dural puncture. The advantages of this manoeuvre are avoidance of a sec-

ond dural puncture and immediate provision of analgesia.⁷ Placement of an intrathecal catheter for the prevention of PDPH has gained popularity and in 2003 was recommended by 59% of UK obstetric units,⁷ compared to only 1% in 1993.⁸ However, in 2010 a meta-analysis of observational studies of intrathecal catheter placement reported no significant benefit.⁹ Because more data have become available, this topic has been re-examined. Our aim was to evaluate the effect of intrathecal catheters on the development of headache, the need for blood patching and the incidence of adverse events.

Methods

We carried out a systematic literature search in PubMed and Embase with the following search terms: “inadvertent dural puncture” OR “accidental dural puncture” OR “unintentional dural puncture” AND “postdural puncture headache” AND “intrathecal catheter”. We employed a broad search strategy in order to be

Accepted October 2012

Correspondence to: Prof. Dr. med. Michael Heesen, Department of Anaesthesiology, Klinikum am Bruderwald, Bugerstr. 80, 96069 Bamberg, Germany.

E-mail address: michael.heesen@sozialstiftung-bamberg.de

inclusive and capture all relevant studies: the PubMed search was conducted without applying Limits; studies published in any language were acceptable. Studies on animals were excluded.

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were followed where appropriate. We considered any mode of delivery including planned and emergency caesarean section eligible for inclusion. No age restriction was applied. Studies on singleton and multiple gestations were both acceptable. In addition to electronic searching, the reference lists of the retrieved articles were examined to identify further articles. We also hand-searched abstract supplements of the annual congresses of American and European societies of anaesthesiology and regional anaesthesia held over the last 10 years. Furthermore, we searched the controlled trials registry (<http://www.controlled-trials.com/>) with the following search phrases “postdural puncture headache”, “intrathecal catheter”, “epidural blood patch”. This identified no relevant trials.

We contacted the authors of two abstract publications^{10,11} and asked for additional information about study design, demographic data of the study groups, and adverse events. We received answers that were incorporated in our results section.

Articles were reviewed by two authors (MH, MvdV) and evaluated for eligibility. Outcome parameters were the incidence of PDPH and the need for EBP, described as dichotomous outcomes. For two studies we combined data from two arms (short-term and long-term catheterisation).^{12,13}

Statistical Analysis

Review Manager (RevMan; Version 5.1, Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2008) was used for meta-analysis. The random effects model was applied and pooled risk ratios (RR) with 95% confidence intervals (95% CI) were calculated. *P* values <0.05 were regarded as statistically significant.

Results

Our literature search retrieved 49 citations (Fig. 1). Eight articles^{10–17} were identified as eligible for inclusion. After our initial search was completed, another eligible study by Russell was published.¹⁸ Therefore, in total, nine studies were included in our review providing data on 963 parturients with PDPH and on 939 patients for EBP. Details of the studies including indications for epidural catheterisation (labour analgesia and/or caesarean section) and length of intrathecal catheterisation as well as participant demographics are presented in Table 1. The RR of PDPH after intrathecal catheter insertion was 0.82 (95% CI 0.67–1.01, *P* = 0.06) (Fig. 2). The RR for the EBP was 0.64 (95% CI 0.49–0.84, *P* = 0.001) (Fig. 3).

The effect size in the study by Ayad et al.¹¹ was much larger than in the other studies. We therefore repeated

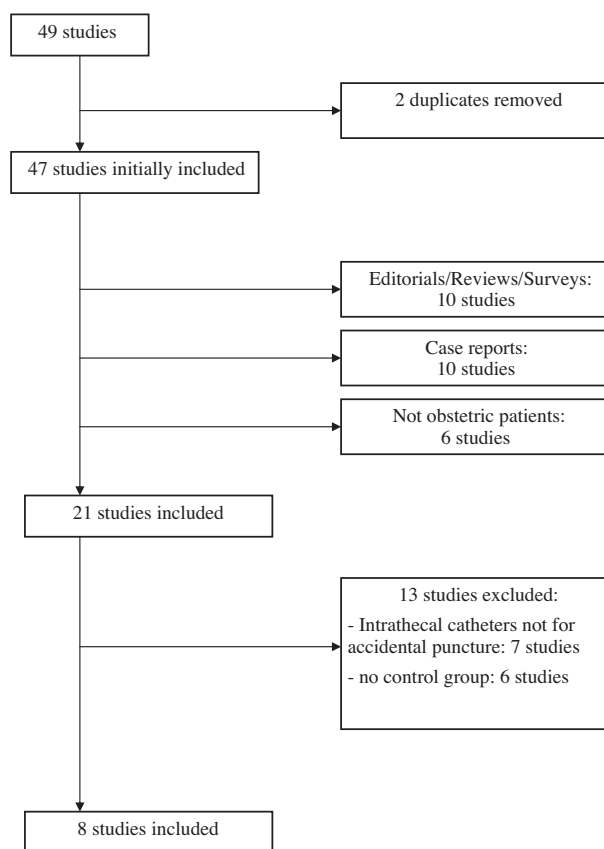


Fig. 1 Flow diagram representing studies of intrathecal catheterisation in original literature search.

our analyses without data from the Ayad study. For the incidence of PDPH we obtained a RR of 0.93 (95% CI 0.84–1.02) and for an EBP a RR of 0.76 (95% CI 0.65–0.88). Therefore, our analyses with and without the report by Ayad et al.¹³ revealed no significant differences for PDPH and significant differences for EBP, strengthening the robustness of our findings.

Nine studies did not report adverse events. Rutter et al. described one case with a high block after intrathecal catheter placement which resulted in dyspnoea, upper limb weakness and hypotension.¹⁴ In response to our request for more information, Kaul reported that one patient in the intrathecal group experienced paraesthesia which disappeared when the catheter was removed.¹¹

Discussion

In our meta-analysis, which included data from nine studies, we found that insertion of an intrathecal catheter produced a significant reduction in the need for an EBP whereas the incidence of PDPH was not significantly different. In a previous meta-analysis, Apfel et al.⁹ also failed to find a significant difference in the incidence of PDPH. They reported a RR of 0.88 (95% CI 0.68–1.14, *P* = 0.32) for PDPH for short-term catheterisation and a RR of 0.21 (95% CI 0.02–2.65, *P* = 0.23) for long-term catheterisation, defined as a

Download English Version:

<https://daneshyari.com/en/article/2757862>

Download Persian Version:

<https://daneshyari.com/article/2757862>

[Daneshyari.com](https://daneshyari.com)