

Original Contribution

The effect of second-stage pushing and body mass index on postdural puncture headache[☆]

Amber M. Franz, MD, MEng^a, Shawn Y. Jia, MD^b, Henry T. Bahnson, MPH^c, Akash Goel, MD^d, Ashraf S. Habib, MBBCh, MSc, MHSc, FRCA^{b,*}

^a Department of Anesthesiology and Pain Medicine, Seattle Children's Hospital, 4800 Sand Point Way NE MB.11.500, Seattle, WA 98105, USA

^b Department of Anesthesiology, Duke University Medical Center, 3094, Durham, NC 27710, USA

^c Benaroya Research Institute, 1201 Ninth Avenue, Seattle, WA 98101, USA

^d Department of Anesthesia, University of Toronto, 12th Floor, 123 Edward St, Toronto, Ontario M5G 1E2, Canada

ARTICLE INFO

Article history:

Received 16 October 2015

Received in revised form 3 October 2016

Accepted 28 October 2016

Available online xxxx

Keywords:

Postdural puncture headache

Topic:

Parturient

Pushing

Topic:

Obesity

Delivery

Labor

ABSTRACT

Study objective: To explore how pushing during labor and body mass index affect the development of postdural puncture headache in parturients who experienced dural puncture with Tuohy needles.

Design: Retrospective cohort.

Setting: Obstetric ward and operating rooms at a university-affiliated hospital.

Patients: One hundred ninety parturients who had witnessed dural puncture with 17 or 18 gauge Tuohy needles from 1999–2014.

Interventions: Patients were categorized by pushing status and body mass index (kg/m²): nonobese <30, obese 30–39.99, morbidly obese 40–49.99, and super obese ≥50.

Measurements: Headache, number of days of headache, maximum headache score, and epidural blood patch placement.

Main results: Compared with women who did not push, women who pushed during labor had increased risk of postdural puncture headache (odds ratio [OR], 2.1 [1.1–4.0]; $P = .02$), more days of headache ($P = .02$), and increased epidural blood patch placement ($P = .02$). Super obese patients were less likely to develop headache compared with nonobese (OR, 0.33 [0.13–0.85]; $P = .02$), obese (OR, 0.37 [0.14–0.98]; $P = .045$), and morbidly obese patients (OR, 0.20 [0.05–0.68]; $P < .01$). In a multivariate logistic regression model, lack of pushing (OR, 0.57 [0.29–1.10]; $P = .096$) and super obesity (OR, 0.41 [0.16–1.02]; $P = .056$) were no longer significantly associated with reduced risk of postdural puncture headache.

Conclusions: Parturients who did not push before delivery and parturients with body mass index ≥50 kg/m² were less likely to develop postdural puncture headache in a univariate analysis. Similar trends were demonstrated in a multivariate model, but were no longer statistically significant.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction

In the obstetric population, the incidence of accidental dural puncture with epidural placement is estimated to be 1.5% [1]. After accidental dural puncture, approximately 50%–80% of parturients will subsequently develop a postdural puncture headache (PDPH), characterized by a postural headache that is relieved by lying flat and worsened by sitting or standing, and that may be accompanied by neck stiffness, tinnitus,

hypoacusis, photophobia, and/or nausea [2–6]. These headaches are often debilitating, interfering with maternal–infant bonding, requiring epidural blood patch (EBP), and prolonging hospital stay [2].

The generally accepted mechanism of PDPH is that leakage of cerebrospinal fluid (CSF) from a dural defect results in decreased CSF volume. When the rate of CSF leakage exceeds the rate of production, a headache results due to traction on the meninges and/or compensatory cerebral vasodilation [7]. Thus, factors affecting the rate of CSF leakage, such as pushing during the second stage of labor and obesity, may impact the development of PDPH.

Prior studies have attempted to evaluate the effects of pushing during labor and body mass index (BMI) on the incidence of PDPH [3,5,8–12]. However, studies are limited and report conflicting results. Furthermore, only one recently published study has focused on investigating these two factors together [5]. The goal of our study was to explore

[☆] Disclosures: None of the authors have any relevant conflicts of interest.

* Corresponding author at: Department of Anesthesiology, Duke University Medical Center, 3094, Durham, NC 27710, USA. Tel.: +1 919 668 6266; fax: +1 919 668 6265.

E-mail addresses: amber.franz@seattlechildrens.org (A.M. Franz), shawn.jia@dm.duke.edu (S.Y. Jia), tbahnson@benaroyaresearch.org (H.T. Bahnson), akash.goel@medportal.ca (A. Goel), ashraf.habib@dm.duke.edu (A.S. Habib).

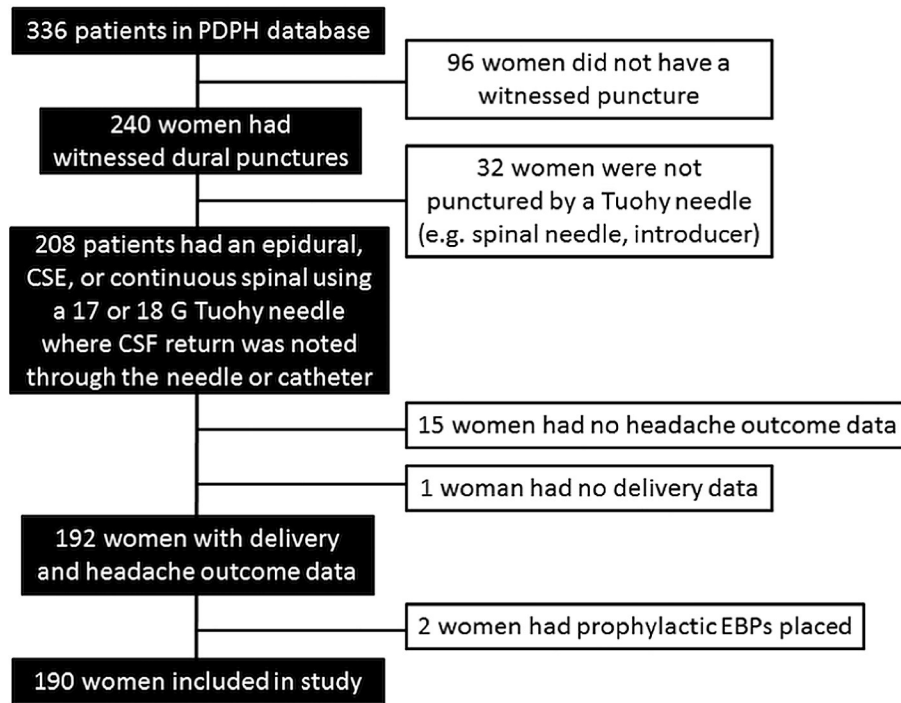


Fig. 1. Flow diagram of study patients. PDPH = postdural puncture headache; G = gauge; EBPs = epidural blood patches.

how pushing during labor and BMI affect the development of PDPH in parturients noted to have witnessed dural puncture during placement of neuraxial anesthesia with Tuohy needles.

2. Materials and methods

This study was approved by the Duke University Health System institutional review board. Data were obtained from the Duke PDPH database, which contains prospectively collected information on parturients who experienced an inadvertent or intentional dural puncture and/or who developed PDPH. These patients are followed both in the hospital and after discharge. They are called daily for about a week after dural puncture, or until resolution of PDPH symptoms.

We retrospectively reviewed the Duke PDPH database from 1999–2014 to identify patients who had witnessed dural puncture(s), defined as return of CSF through the Tuohy needle and/or catheter during placement of epidurals, combined spinal-epidurals, or continuous spinals with 17- or 18-gauge Tuohy needles. Women were excluded if (a) the needle-type responsible for puncture was not a Tuohy (eg, spinal needle or introducer), (b) delivery or primary headache outcome data were unavailable despite extensive review of handwritten and electronic medical records, or (c) a prophylactic EBP was placed.

Patients were divided into two groups; those who pushed before delivery and those who did not. Any woman who pushed during the second stage of labor was included in the former group, regardless of the ultimate mode of delivery. The medical records of all included patients were reviewed to determine if they pushed before delivery. Parturients were also categorized into the following four groups according to BMI (kg/m^2): nonobese with BMI <30, obese with BMI 30–39.99, morbidly obese with BMI 40–49.99, and super obese with BMI ≥ 50 [13,14].

The primary outcome was the presence of PDPH. Secondary outcomes included number of days of headache, maximum headache score (0–10), and EBP placement. We also collected information about age, height, weight, American Society of Anesthesiologists (ASA) physical status score, method of delivery (assisted vaginal, spontaneous vaginal, or cesarean), and placement of spinal catheters.

We analyzed the relationship between headache, pushing status, and BMI using univariate and multivariate statistical methods.

Univariate analyses were performed using Wilcoxon rank sum tests, χ^2 tests, and Kruskal-Wallis tests, as appropriate. Body mass index was analyzed as both a continuous and categorical variable. A regression tree analysis using a model-based recursive partitioning approach was performed to determine the most highly predictive BMI cutoff for developing PDPH. Multivariate analyses were performed to evaluate for confounders. Both theory and *P* value thresholds were used to build the logistic regression model. Pushing status and BMI were automatically included in the model as these were the factors of interest. Additional variables were considered for inclusion in the model based on their association with headache ($P < .05$) in the univariate analyses. Contingency analyses and multicollinearity testing aided in determining the final variables entered in the logistic regression model. Goodness of fit and concordance statistic testing were performed on the model. All analyses were done with SAS version 9.3 (proc logistic and proc univariate; SAS Institute, Cary, NC) and JMP version 12 (bivariate and partition

Table 1

Characteristics of patients with and without postdural puncture headache

Variable	PDPH ^a (N = 131)	No PDPH ^a (N = 59)	<i>P</i>
Age (y)	29 (24–34)	28 (21–32)	.11 ^b
Height (cm)	163 (158–168)	163 (158–170)	.28 ^b
Weight (kg)	81 (71–103)	86 (70–130)	.17 ^b
BMI (kg/m^2)	31 (27–40)	32 (27–44)	.31 ^b
BMI category (kg/m^2)			
BMI <30	56 (43%)	22 (37%)	
BMI 30–39.9	43 (33%)	19 (32%)	.046 ^c
BMI 40–49.9	21 (16%)	5 (8.5%)	
BMI ≥ 50	11 (8.4%)	13 (22%)	
ASA score	2 (2–3)	2 (2–3)	.20 ^b
Pushed during labor	90 (69%)	30 (51%)	.02 ^c
Spontaneous vaginal delivery	81 (62%)	23 (39%)	<.01 ^c
Assisted vaginal delivery	8 (6.1%)	4 (6.8%)	.86 ^c
Cesarean delivery	42 (32%)	32 (54%)	<.01 ^c
Spinal catheter inserted	95 (73%)	47 (80%)	.29 ^c

PDPH = postdural puncture headache; BMI = body mass index; ASA = American Society of Anesthesiologists.

^a Data are median (interquartile range) or number (percentage).

^b Wilcoxon rank sum test.

^c χ^2 Test.

Download English Version:

<https://daneshyari.com/en/article/5582932>

Download Persian Version:

<https://daneshyari.com/article/5582932>

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