Brief Clinical Report

Postdural puncture headache after spinal anaesthesia in young orthopaedic outpatients using 27-g needles

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Purpose: Two large studies reported a very low rate (0.5-1.8%) of postdural puncture headache (PDPH) with the use of 27-G spinal needles. We suspected that it might be higher in young ambulatory patients. The purpose of this study was to establish the rate prospectively in such a patient population using two types of needles.

Methods: Two hundred male and female, outpatients, 18-45 yr, undergoing knee arthroscopy under spinal anaesthesia were randomly assigned to receive spinal anaesthesia with hyperbaric lidocaine 5% using either a Quincke or a Whitacre 27-G needle. Twenty patients choosing general anaesthesia formed a comparative group. Using a previously validated questionnaire, the incidence and nature of PDPH were evaluated by telephone three to five days after surgery by an anaesthetist unaware of the anaesthetic technique used. Once all data were collected, an anaesthetist not involved in the study determined in a blinded fashion which headaches were likely to be PDPH. Grading and classification of headaches were based on several criteria: postural nature, duration, intensity and confinement to bed.

Results: The overall incidence of PDPH in both spinal groups was 9.3%. The incidence in women, 20.4%, was higher than in men, 5.5%, ($P < 0.05$). Only one patient required a blood patch. Both types of needle were comparable with respect to the incidence, severity and duration of PDPH, number of dural punctures and failed spinal blocks.

Conclusion: The rate of PDPH was higher than in large published studies with 27-G Quincke and Whitacre needles and greater in women than in men.

Objectif : Deux grandes séries ont montré un taux très bas (0,5 - 1,8 %) de céphalée post ponction durale (CPPD) avec l'emploi d'aiguilles de calibre 27. Nous avons émis l'hypothèse qu'il pourrait être plus élevé chez de jeunes patients ambulatoires. L'objectif de notre étude était donc d'établir de façon prospective le taux de CPPD chez une telle population de patients en utilisant deux types d'aiguilles.

Méthode : Deux cents hommes et femmes, patients ambulatoires de 18 à 45 ans, devant subir une arthroscopie du genou sous rachianesthésie, ont été répartis au hasard pour recevoir une rachianesthésie avec de la lidocaïne hyperbare 5 % à l'aide d'une aiguille 27 Quincke ou Whitacre. Vingt patients, ayant choisi une anesthésie générale, ont formé un groupe témoin. Utilisant un questionnaire validé dans le passé, l'incidence et la nature des CPPD ont été évaluées par téléphone trois à cinq jours après la chirurgie par un anesthésiste qui ne connaissait pas la technique anesthésique employée. Une fois que toutes les données ont été recueillies, un anesthésiste non impliqué dans l'étude a déterminé d'une manière impartiale quelles étaient les céphalées qu'on pouvait étiqueter comme des CPPD. La cotation et la classification des céphalées ont été basées sur quelques critères : la nature posturale, la durée, l'intensité et le confinement au lit.

Résultats : L'incidence globale de CPPD des deux groupes sous rachianesthésie a été de 9,3 %. L'incidence chez les femmes, 20,4 %, a été plus élevée que chez les hommes, 5,5 %. ($P < 0,05$). Un seul patient a requis un hémopatch. Les deux types d'aiguilles ont été jugés semblables en ce qui a trait à l'incidence, la sévérité et la durée des CPPD, au nombre de ponctions dures et de blocages rachidiens non réussis.

Conclusion : Le taux de CPPD a été plus élevé que lors d'une grande série publiée déjà où l'expérience avait été faite avec des aiguilles 27 Quincke et Whitacre, et plus élevé chez les femmes que chez les hommes.

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S PINAL anaesthesia has been widely used in our institution for ambulatory orthopaedic surgery, particularly since the availability of 27-G Quincke spinal needles. Two large studies have reported a very low incidence of postdural puncture headache (PDPH) with 27-G spinal needles (0.5-1.8%).^{1,2} However, we have been concerned that the incidence might be higher in young ambulatory patients.

The purpose of this study was to establish the incidence of PDPH in young patients undergoing knee arthroscopy under spinal anaesthesia using either a 27-G Quincke needle or a 27-G Whitacre needle.

Methods

After hospital ethics committee approval and informed consent, 200 ASA I and II outpatients, aged 18-45 yr scheduled for knee arthroscopy were randomly assigned to two groups. In Group 1 (100 patients), spinal anaesthesia was performed with a 27-G Quincke spinal needle (Becton and Dickinson (BD)), and in Group 2 (100 patients), with a 27-G Whitacre needle (BD). Group 3 consisted of 20 patients who chose general anaesthesia. Exclusion criteria included a history of migraine headaches or previous PDPH. Patients with failed spinal anaesthesia were included in their preassigned group.

Spinal anaesthesia was performed with the patient sitting and using a midline approach at L₂₋₃ or L₃₋₄. In Group 1, the needle bevel was inserted vertically. In all cases, the local anaesthetic was 80-100 mg. lidocaine 5%. In group 3, the anaesthetic technique was at the discretion of the anaesthetist.

All patients were discharged with a copy of a visual analog scale (VAS) of 0 to 10 and contacted by telephone three days after surgery (a few patients were contacted on day four or five). The interview was conducted by an anaesthetist unaware of the anaesthetic technique used. Patients were asked a few questions about their general well being and satisfaction with the anaesthetic before being asked specifically about the occurrence of headache postoperatively. The nature and severity of headaches were characterized using the VAS and a previously validated questionnaire.³ Therapy with caffeine was recommended to patients experiencing postural headache. An epidural blood patch was offered when indicated by follow up.

An anaesthetist not involved in the study determined, in a blinded fashion, which headaches were likely to be PDPH. The most important criterion for classifying headache as PDPH was its postural nature. Transient headaches limited to the day of surgery were not considered PDPH. Mild headaches were those not interfering with normal activities or lasting less

than one day. Headaches of moderate intensity interfered with normal activity and lasted > one day and < three days or required confinement to bed for < two days. Severe headaches lasted > three days or required > two days of bedrest or required a blood patch. Grading was done by the authors without knowledge of the type of spinal needle used.

Statistical analysis was with Chi-square analysis (X^2) (Yates correction for continuity if necessary), the Mann-Whitney test or Analysis of Variance (ANOVA) (one way non correlated) where appropriate. $P < 0.05$ was considered significant. Confidence intervals (95%) were calculated for the overall incidence of PDPH and for the difference in the incidence of PDPH between Group 1 and Group 2.

Results

Six of the 220 patients who participated were excluded from analysis because exclusion criteria had been missed or because they could not be contacted, leaving 97 patients in Group 1, 97 patients in Group 2 and 20 patients in Group 3. Five patients received general anaesthesia for inadequate spinal block, four in Group 1 and one in Group 2.

All groups were comparable with respect to age and sex. Spinal groups were comparable with respect to the number of dural punctures required and failed blocks.

The overall incidence of PDPH in the combined spinal groups was 18/194 patients, i.e. 9.3%, (95% confidence interval 5.2 - 13.4%). The incidence of PDPH in women [10/49, 20.4% (95% confidence interval 9.1-31.7%)] was higher than in men [8/145, 5.5% (confidence interval 1.1-9.9%)] ($P < 0.05$). Age, the number of dural punctures, failed spinal anaesthesia, spontaneous complaints of back pain and satisfied patients were not different between patients who developed PDPH and those who did not (Table I).

The incidence of PDPH in individual groups was 10.3% in Group 1 (10/97 patients), 8.2% in Group 2 (8/97 patients) and 0% in Group 3. The difference between the incidence of PDPH in groups 1 and 2 is 2.1%, (95% confidence interval -4.14 - +8.34%) (P NS) (Table II).

Discussion

The incidence of PDPH in our study is high. Kang *et al.* observed an incidence of PDPH of 1.5% using a 27-G Quincke needle in a group of 336 ambulatory patients with no sex or age related effects.¹ However, criteria used to define a PDPH were not reported. Lynch *et al.* compared the incidence of PDPH with the 27-G Quincke and 27-G Whitacre needles in 398 inpatients undergoing elective orthopaedic procedures.

TABLE I Comparisons between patients with and without PDPH

	PDPH	No PDPH	P
Number of patients = 194	18	176	
Sex: Male, Female	8,10	137,39	< 0.05
Average Age, yr	31.9	32.3	NS
Number of Dural Punctures (1 or 2)	1 = 15 2 = 3	1 = 169 2 = 7	NS
Failed Spinal	1	4	NS
Back Pain	6	43	NS
Satisfaction	15	167	NS
Would Choose the Same Technique	15	165	NS

TABLE II Comparisons between groups 1, 2 and 3

	GROUP 1 (Quincke)	GROUP 2 (Whitacre)	GROUP 3 (GA)
Number of patients = 214	97	97	20
Sex: Male	74	71	14
Female	23	26	6
Average Age yr	32.5	31.7	33.8
Number of Dural Punctures (1 or 2)	1 = 90 2 = 7	1 = 94 2 = 3	
Failed Spinal	4	1	
All Headaches	23	21	3
PDPH	10	8	0
VAS (mean)	7.32	6.87	Mann-Whitney U (10,8) P > 0.05
Severity:			
mild	1	1	
moderate	5	3	
severe	4	4	
Mean Duration (hr)	57.2	40.5	
Back Pain	22	27	1
Satisfaction	88	94	20
Would Choose the Same Technique	89	91	20

GA: general anaesthesia; VAS: visual analog scale;

P: NS among groups.

Their overall rate of PDPH was 0.8%² but a large proportion of the patients were > 45 yr and none were ambulatory. Recently, in 200 patients < 45 yr undergoing day care surgery, Corbey *et al.* observed a PDPH incidence of 0% with the 27-G Whitacre needle and

5,6% with the 27-G Quincke needle ($P = 0.05$).⁴ However he reports cases of postdural puncture-related headache (PDPH-H) which were neither postural nor similar to patients habitual headaches. Such PDPH-H might have been considered PDPH in our study.

Other studies have shown a rate of PDPH comparable to ours.⁵⁻⁷ Coré *et al.* in 262 patients undergoing emergency or elective surgery under spinal anaesthesia with a 27-G Quincke needle found a rate of PDPH of 10.3%, with a higher incidence in women (16%) and in patients < 40 yr (19.6%).⁶ This is the only study demonstrating an effect of age and sex on the incidence of PDPH, using a 27G needle. Smyth *et al.* reported mild or moderate PDPH in 12.5% of 135 patients undergoing knee arthroscopy under spinal anaesthesia with a 27-G Whitacre needle.⁷

Thus reported rates of PDPH using 27-G needles vary widely (0-12.8%). Our relatively high rate may reflect in part the sensitivity of our interview technique. Also, the specificity of our criteria for diagnosing PDPH seems appropriate as a similar rate of non-specific headaches was found in all groups and no cases of PDPH were diagnosed in the group of patients choosing general anaesthesia. Also, our study presents the advantage of using a previously validated questionnaire. Unlike Corbey *et al.*, we are unable to demonstrate an effect of the type of needle bevel on the incidence of PDPH. Though sample sizes were similar, the power of our study was insufficient to prove the null hypothesis.

In summary, in a group of young patients undergoing out-patient arthroscopy with spinal anaesthesia the PDPH rate with 27-G spinal needles was 9.3%, greater in women than in men and exceeding that of previous large studies.

References

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