



The Comparison of Post-dural Puncture Headache- Frequency and Severity on Cesarean Patients that Spinal Anaesthesia Performed with 25G, 27G and 29G Quincke Needles 25G, 27G ve 29G Quincke İğneler ile Spinal Anestezi Uygulanan Sezaryen Hastalarında Dura Ponksiyonu Sonrası Başağrısı Sıklığı ve Şiddetinin Karşılaştırılması

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Özet

Amaç: Bu çalışmanın amacı 25G, 27G ve 29G quincke iğneler ile spinal anestezi uygulanan sezaryen hastalarında ameliyat sonrası spinal anesteziye bağlı gelişen Dura Ponksiyonu Sonrası Başağrısı (DPSBA) sıklığını ve şiddetini karşılaştırmaktır.

Materyal-Method: Klinik Araştırmalar Yerel Etik Kurulunun onayı alındıktan sonra, ASA I-II, 18 yaş üzeri elektif sezaryen cerrahisi planlanan 60 hasta çalışmaya alındı. Hastalar randomize olarak 3 gruba ayrıldı. Grup I hastalara (n=20) 25G, Grup II hastalara (n=20) 27G, Grup III hastalara (n=20) 29G (kılavuzlu) quincke keskin uç iğneler kullanılarak spinal anestezi uygulandı. Spinal anestezi başarısız veya yetersiz olan hastalarda genel anesteziye geçildi ve hastalar çalışma dışı bırakıldı. Hastalarda DPSBA gelişip gelişmediği, ağrının süresi ve şiddeti 2. haftaya kadar gerekirse telefonla hastalara dönüş yapılarak sorgulandı ve kayıt altına alındı. DPSBA şiddeti Lybecker sınıflamasına göre derecelendirildi.

Bulgular: Toplamda 60 hastanın 9'unda (%15,0) DPSBA oluştu. Grupların kendi içinde dağılımı; Grup I'de 20 hastanın 5'inde (%25,0), Grup II'de 20 hastanın 3'ünde (%15,0), Grup III'de 20 hastanın 1'inde (%5,0) DPSBA oluştu. Grup I'de 2 hastada şiddetli DPSBA olurken Grup II ve Grup III'de şiddetli DPSBA oluşmamıştır. Gruplar arasında DPSBA insidansı açısından istatistiksel olarak anlamlı bir fark bulunmadı.

Sonuç: Farklı iğne boyutları arasında istatistik olarak fark bulunmasa da DPSBA riskini en aza indirmek için eğer elde edilebiliyor ise klinik pratikte 29 G kılavuzlu keskin uçlu iğne tercih edilebilir.

Anahtar kelimeler: Sezaryen, Spinal Anestezi, Dura Ponksiyonu Sonrası Başağrısı

Abstract

Objective: The aim of this study is to compare the frequency and severity of Post-dural Puncture Headache (PDPH) between the cesarean patients that was spinal anaesthesia performed with 25G, 27G and 29G quincke needles.

Material-Method: Following the approval of Clinical researches local Ethics Committee 60 ASA I-II clinical status patients above 18 years that cesarean section was planned included in the study. Patients were randomised to three groups. The spinal anaesthesia was performed with 25G guided quincke sharp-tipped needle to Group I (n=20), with 27G needle in Group II (n=20) and with 29G needle in Group III (n=20). General anesthesia was performed in unsuccessful spinal anaesthesia patients and they were excluded from the study. The PDPH, the time and the severity till the second week of the operation and was asked and reported. The severity was degreed according to Lybecker classification.

Results: PDPH was reported on 9 of total 60 patients (15.0%). The distribution was as: 5 patients in Group I (25.0%), 3 patients in Group II (15.0%), and 1 patient in Group III (5.0%). Severe PDPH was occurred in 2 patients in Group I and was not occurred in any patients in Group II and III. There was no significant difference statistically between groups by the means of PDPH.

Conclusions: At least for preventing the risk, although there is no statistically difference between different needle sizes; we think that 29G guided needle may be preferred in the clinical practice if available.

Keywords: Cesarean Section, Spinal Anesthesia, Post-dural Puncture Headache

Introduction

Together with the increase in cesarean operations in recent years, the anaesthesia method to be applied has become more important. Regional anaesthesia techniques have started to be used more widely in cesarean operations because of advantages

such as the patient being conscious, no risk of aspiration and no respiratory depression of the newborn, making it a choice of the surgeon associated with experience and most importantly on patient request (1). However, the choice of regional anaesthesia does not eliminate anaesthesia-related

complications. One of the most common complications as a postoperative complaint of patients following caesarean is post-dural puncture headache (PDPH) associated with spinal anaesthesia (2, 3).

The American Academy of Neurology defines PDPH as a bilateral headache that develops within 7 days of lumbar puncture and resolves within 14 days (4). PDPH that develops because of spinal anaesthesia is related to the type and measurement of the needle used. The incidence of PDPH has been reported to be low with pencil-point needles and high with Quincke point needles (5, 6). The second factor affecting PDPH incidence is the needle gauge (7, 8).

The aim of this study was to compare the incidence and severity of postoperative PDPH in cesarean operation patients applied with spinal anaesthesia using Quincke point 25G, 27G and 29G (guided) needles.

Material and Method

The study included 60 patients, aged >18 years, ASA I-II, who were planned to undergo elective cesarean section. Approval for the study was granted by the Clinical Research Local Ethics Committee (decision no:188, dated 19.11.2014). Informed consent was obtained from all participants. The study was performed prospectively, randomly, double-blind. Patients were excluded if they had bodyweight of >100 kg, height of >180 cm, chronic headache or migraine, pre-eclampsia, eclampsia, local anaesthetic or opioid allergy, anatomic impairment of the vertebral column, bleeding diathesis, a history of anticoagulant use, emergency cesarean section or if more than 2 attempts were made for spinal anaesthesia.

The patients were randomly separated into 3 groups. On admittance to the operating room, ECG at DII derivation, heart rate, non-invasive systolic artery pressure (SAP), mean arterial pressure (MAP), diastolic arterial pressure (DAP) and peripheral oxygen saturation (SpO₂) were monitored and recorded. After opening an IV route with a 20G Branule, an infusion of 500-1000ml 0.9% NaCl solution was applied. After completion of the infusion, the patient was brought into a sitting position and the necessary asepsis conditions were applied. Spinal anesthesia process is applied by less 2

years specialist students. Using 3 Quincke point needles as 25G for Group 1 (n=20), 27G for Group II (n=20) and 29G (guided) for Group III (n=20), spinal anaesthesia of 2-2.5 ml 0.5% hypertonic bupivacaine was applied between L3-4 or L4-5. Then the patients were positioned supine. To prevent aortocaval compression, the patients were moved into a 15°-20° left lateral position.

From the beginning to the end of the operation, 100% oxygen was administered via a nasal cannula at the rate of 3-5 lt/min. The motor block level was evaluated with the Bromage scale and sensory block with the "pin-prick test" and cold pack application. The operation was started when the sensory block reached an adequate level (T4). In patients where spinal anaesthesia was not successful or was not sufficient, general anaesthesia was applied and these patients were excluded from the study. After the sensorial block finishes; aldolan® 4 times a day intramuscularly was applied to the patients. On postoperative 1st day; approximately 3500 mL crystalloid solution was infused to the patients. Postoperatively patients were questioned about whether or not headache had developed, and if so, the duration and severity, with a return telephone call if necessary up to 2 weeks afterwards. The responses were recorded and headache severity was graded according to the Lybecker classification (9) (Table 1).

Statistical Analysis

Data obtained in the study were evaluated using SPSS vn 15.0 software. The demographic data of the patients were evaluated using the One-Way ANOVA test. The incidence and severity of PDPH developing with different gauge needles was evaluated with the Chi-Square test and correlations between the headache severity and duration were examined with Pearson Correlation Analysis. A value of p<0.05 was accepted as statistically significant.

Results

A total of 60 patients were included in the study. The demographic data of the patients were determined as similar in all the groups (Table 2). All the patients were cases of elective cesarean section. PDPH developed in 9 (15.0%) of the total 60 patients. Distribution within the groups was

Table 1. Lybecker Classification

Grade	Signs and Symptoms
Mild	- Daily activities are mildly restricted, but the patient is not bedridden
	- No accompanying symptoms, responds to non-opioid treatment
Moderate	- Daily activities are restricted,
	-The patient is bedridden for most of the day,
	-There may or may not be accompanying symptoms, there is a need for opioids
Severe	- Intolerable headache, impossible to live with,
	- Continuous accompanying symptoms
	- No response to conservative treatment.

5/20 (25%) in Group I, 3/20 (15.0%) in Group II and 1/20 (5%) in Group III. In 2 of the Group I patients, the PDPH was reported as severe, while the PDPH in Groups II and III were not severe. No statistically significant difference was determined between the groups in respect of PDPH incidence and severity (Table 3). In the patients who developed PDPH, a high positive correlation was determined between the severity and duration of PDPH ($r=0.462$, $p<0.0001$) (Table 4).

In the follow-up of the patients, those with mild and moderate PDPH were recommended bedrest with plentiful intake of fluids and caffeinated drinks, and when necessary, the regular use of oral analgesics. Of the 2 Group I patients with severe headache, 1 presented at the Algology Dept of our hospital and was applied with an epidural blood patch. The other patient presented at the Emergency Dept because of the severe PDPH. In 2 patients in Group II, the PDPH of mild severity lasted for 14 days.

Discussion

The results of this study found statistically similar rates of incidence and severity of postoperative PDPH in patients applied with spinal anaesthesia using 25G, 27G and 29G (guided) Quincke point needles.

In current-day cases who are to undergo cesarean operation, both general and regional (spinal, epidural and combined spinal-epidural) anaesthesia techniques are applied as an anaesthetic approach (10). As a result of technological developments, in parallel with the increased use of spinal anaesthesia, there is increasing use of spinal anaesthesia in caesarean cases. Regional anaesthesia has the advantages of the patient being conscious, no risk of aspiration and no respiratory depression of the newborn. In several studies that have compared regional anaesthesia with general anaesthesia in elective cesarean operations, there have been seen to be fewer effects on the infant with regional anaesthesia (11, 12).

Table 2. Demographic characteristics of the cases (Mean \pm SD,n)

	Group I (n=20)	Group II (n=20)	Group III (n=20)	p
Age(years)	29.50 \pm 6.65	29.80 \pm 5.74	31.60 \pm 5.92	0.879 ^Ω
Height (cm)	162.15 \pm 8.67	161.90 \pm 5.38	160.80 \pm 6.45	0.312 ^Ω
Weight(kg)	77.70 \pm 9.40	77.75 \pm 8.80	75.60 \pm 11.09	0.538 ^Ω
BMI	29.60 \pm 3.35	29.70 \pm 3.49	29.29 \pm 4.47	0.432 ^Ω

BMI: Body Mass Index

^Ωone-way ANOVA test result

Table 3. Post-dural Punction Headache (PDPH)

	Group I (n=20) & %	Group II (n=20) & %	Group III (n=20) & %	p
Incidence	5 (25.0%)	3 (15.0%)	1 (5.0%)	0.208 ^π
Severity				0.126 ^π
Mild	-	2 (10.0%)	1 (5.0%)	
Moderate	3 (15.0%)	1 (5.0%)	-	
Severity	2 (10.0%)	-	-	
Duration				
<24 hours	1	-	-	
25-48hours	-	1	-	
>48 hours	4	2	1	

^πChi-square test result

Table 4. The relationship between headache severity and duration

Headache severity	Days of headache	
	p	<0.0001 [‡]
r	0.462	

[‡]Pearson correlation test result

PDPH following spinal anaesthesia of neuroaxial anaesthesia is a significant complication that can develop as a result of incorrect dural puncture during epidural anaesthesia. Obstetric patients are thought to be at greater risk of this because of young age, gender and the widespread use of neuroaxial blocks. Although PDPH generally recovers spontaneously, it has the potential to cause significant morbidity in obstetric patients. At the same time it prevents the new mother from being able to look after herself and the infant, can prolong the length of stay in hospital and may become a chronic headache (13, 14). The factor with the most impact on the formation of PDPH following spinal anaesthesia is the needle type and thickness. Although PDPH is reported at rates of 0%-37% depending on the needle characteristics, these rates are higher in young and obstetric cases compared to elderly patients (15). In the current study of obstetric patients, PDPH was determined to have developed in 9 of the total 60 patients, which was an incidence of 15%. The incidence of PDPH following spinal anaesthesia applied with 25G, 27G and 29G (guided) Quincke point needles was found to be 25%, 15% and 5% respectively. Development of PDPH was determined in 5/20 patients in Group I with 25G, in 3/20 in Group II with 27G and 1/20 in Group III with 29G Quincke point needles. These rates were found to be similar to the findings of previous studies. In a study by Shah et al of 75 caesarean patients, after spinal anaesthesia applied with 25G Quincke, 27G Quincke and 27G Whitacre needles, the PDPH incidence was determined as 20%, 12.5% and 4.5% respectively, with headache in a total of 9 patients; 5/25 in the 25G Quincke group, 3/25 in the 27G Quincke group and 1/25 in the 27G Whitacre group (16). Similar to the current study, no statistically significant difference was determined between the groups in respect of PDPH incidence. Likewise, Syed et al found no difference between groups in a comparison of the incidence of PDPH which developed following spinal anaesthesia applied with 25G and 27G Quincke needles in caesarean patients (7).

The prevention of PDPH must be a primary target of clinicians. Basically, care given to the relevant factors in the procedure can significantly reduce the incidence. In a study by Ayub et al, 25G and 27G needles were used in a total of 124 caesarean patients and the incidence of PDPH was found to be statistically significantly lower in the 27G needle group. No difference was found between the groups in respect of the severity of headache (17). In the current study, no statistically significant difference was determined between the groups in respect of headache severity, but a significantly positive correlation was found between the severity and duration of the headache ($r=0.462$, $p<0.0001$).

The use of different types of fine needles has reduced the fear of headache in patients and increased the incidence of use of spinal anaesthesia techniques. However, rates of failure and difficulty have increased. Needle deformity, especially of the extremely flexible 29G needles seems to be one of the primary causes of difficulties. In the current study, the 29G Quincke needles were used guided and no technical difficulty was experienced. In a study by Neves et al, 29G guided needles were also used with no difficulty and it was

reported that routine guide use defining the direction during entry was an important factor. Similar to the current study, no statistically significant difference was found in respect of PDPH incidence following spinal anaesthesia applied to caesarean patients with 27G and 29G Quincke needles (18).

Conclusion

The results of this current prospective study showed us that there is no difference of PDPH incidence and severity in spinal anaesthesia performed pregnant patients with different size needles. PDPH is the most important factor that reduces the life quality in pregnant patients and it should be prevented. For this aim; at least for preventing the risk, although there is no statistically difference between different needle sizes; we think that 29G guided needle may be preferred in the clinical practice if available.

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