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Research Article

Postdural puncture headache after spinal anesthesia in cesarean section: Experience in six months in 2736 patients in Kasr El aini teaching hospital – Cairo University

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KEYWORDS

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Abstract *Background:* This is a prospective, single-blinded observational study examined the frequency and severity of postdural puncture headache in the Egyptian female patients following spinal anesthesia for cesarean section.
Method: All the females scheduled for cesarean section under spinal anesthesia in Cairo university were included and divided into two groups, one with Quinke needle G22 and one with Quinke needle G20, both groups were followed up for 7 days regarding incidence and severity of PDPH.
Result: The overall incidence of postdural puncture headache was 32.58% in group with Quinke needle G22, while it was 32.86% with the group used Quinke needle G20, PDPH almost relived by the fifth day in both groups, patients rated their headache as mild to moderate on a 10-cm visual analog scale.
Conclusions: This study is a documentation of the Cairo University teaching hospital experience with PDPH in female patient undergoes spinal anesthesia, and it focus on the incidence and severity related to the needle size and Egyptian population. We recommend the usage

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of the pencil point needle or a smaller needle in Cairo university hospital regardless the economic, teaching and manufacturing reasons.

1. Introduction

Nowadays spinal anesthesia for cesarean section is well established because of its safety, low cost and reliability [1,2]. Epidural anesthesia although it is a reliable alternative with better blood pressure control and pain less labor, but because of high cost and lack of personnel still not widely used in our developing country [3–5]. Therefore spinal anesthesia is the first choice; unfortunately the spinal anesthesia especially in obstetrics associated by postdural puncture headache (PDPH) which may restrict the patient acceptance to this type of anesthesia and increase the mother suffer postoperatively [6].

There is a relation between the incidence of the PDPH and the needle size and type, it is 75% with 16–18 G needles, 30% with 22 G Quinke needles and decreased to 0.37% with the 27 G pencil point needles which is widely used now [1].

The risk factors were looked after in many publications regarding the developed and developing countries with less consideration to the developing countries and no consideration to Egypt [5,6].

In Cairo university teaching hospital (Kasr el Ainy) spinal anesthesia became the first priority for the obstetric patient since 2005 and became established over all the country during the following years, gradually accepted by the community and now even requested by the patients.

Because of the lack of resources and shortage of money, also lack of experience of the trainees the usual needles used in spinal anesthesia in Cairo university teaching hospital (Kasr el Ainy) are Quinke needles 22 G and 20 G with more incidence of PDPH and more patient suffer.

This study was designed for documentation of the number of patients, incidence and severity of PDPH in both needles sizes and the method of follow-up and management in Cairo university teaching hospital (Kasr el Ainy) obstetric department which is a very busy department with annual admission rate of about 12,000 cases with about 60% rate of cesarean section.

2. Methods and material

After the scientific committee approval in the anesthesia department in faculty of medicine, Cairo University, all cases admitted to the obstetric department in Cairo university teaching hospital were included prospectively in this study from 4/2/2011 till 4/8/2011 (the end of the rotation).

Any case with no contra-indications to spinal anesthesia was included.

While all cases with contra-indications to spinal as such as refusal, emergency, coagulopathy, infection, hypotension, bleeding anesthesia were excluded.

The block was performed by the on duty anesthetist regardless his experience, while the follow-up was done by another anesthetist not present in that day and was blinded to the patient and the anesthetist who performed the block.

All the patients were preloaded by crystalloid (normal saline 0.9% or Ringer's solution) 1000 cc; the block was performed by Quinke needle with the bevel directed laterally in the sitting position.

The anesthetist was free to choose the size (22, 20) of the needle and the approach (midline or paramedian).

After successful dural puncture 2.5 cc composed of 10 mg 0.5% bupivacaine +0.5 cc fentanyl (25 μg), then the patient laying flat quickly with lateral uterine displacement using a subiliac wedge, then the level was confirmed (T4) and the surgeon was allowed to work .

Any patient with dural puncture was included even if she experienced a surgical complications (bleeding, injury, hysterectomy), failed spinal, total spinal, or even request to have general anesthesia after the spinal.

The anesthetist was recording the patient weight, height, age, medical history, number of punctures, level of puncture, level of the block, vital signs (blood pressure every, heart rate, ECG, O2 saturation) before the block performance and after the block every 5 min for the next 45 min.

The patient was then followed up by another anesthetist who was blinded to the patient, the anesthetist who performed the block, the size of the needle and the number of punctures.

The patient was followed up in the day one, three and seven by visit if she is in the hospital or by phone call regarding PDPH (incidence, onset, duration, and severity, associated symptoms like neck spasm and vomiting, methods of treatment).

PDPH was defined as a headache in the frontal or occipital area increasing with standing and decreasing by lying flat, and severity was simply defined as mild moderate and sever with correlation to the VAS (visual analog scale) 0–10; 0 = no headache, 1–3 = mild headache, 4–7 moderate headache, >7 = severe headache.

All patients were informed verbally and by a written paper that if they experienced headache to lay flat, decrease activity, to drink fluids and coffee even 4 cups every day, to take Panadol extra (500 mg paracetamol +65 mg caffeine) two tablets every 8 h, and if the headache persist to call us (we allocate an anesthetist every day for calls).

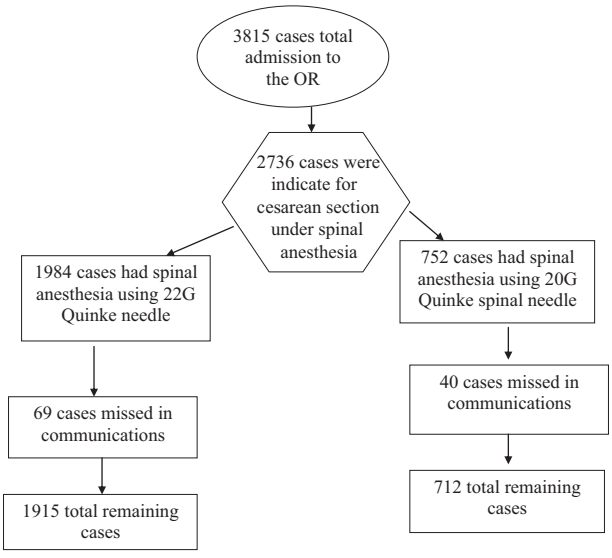
Any patient with sever PDPH or persistent more than 7 days will recommended to have an epidural patch.

The data were collected and sent to statistical analysis that were statistically described in terms of mean ± standard deviation (±SD), and range, or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was done using one way analysis of variance (ANOVA) test with post hoc multiple 2-group comparisons. Within group comparison of numerical variables was done using repeated measure ANOVA through a general linear model with paired t test as a post hoc test. For comparing categorical data, Chi square (χ^2) test was performed. Yates correction equation was used instead when the expected frequency is less than 5. p values less than 0.05 was considered statistically significant. All statistical calculations were done using computer programs SPSS (Statistical

Package for the Social Science; SPSS Inc., Chicago, IL, USA) version 15 for Microsoft Windows.

3. Results

During 177 days which is the rotation duration (around six months) 3815 cases were admitted to the OR (operating room) 2736 were indicated for cesarean section under spinal anesthesia (219 (8%) had general anesthesia (GA), the rest of the cases were indicated for another surgeries like evacuation, ectopic pregnancy, all the caesarian section cases experienced spinal anesthesia for cesarean section were included in this survey.



1984 (72.51%) cases experienced spinal anesthesia with Quinke needle 22G named Group 22 (G22) and 752 (27.48%) cases experienced spinal anesthesia with Quinke needle 20G named Group 20 (G20).

This selection is based on the availability of the needles and the choice of the anesthetist.

All cases were followed up by visit or phone communications in day one, three and seven, and 69 (3.47%) cases were missed in communication from G22 and 40 (5.31%) cases were missed from G20 so the total cases became 1915 in G22 and 712 cases in G20.

The average age of the females was 27.65 ± 5.4 years in G22 and 28.76 ± 5.9 years in G20, the average weight was 76.2 ± 15.01 kg in G22, and 77.61 ± 10.51 Kg in G20; there are no statistical differences between the two groups regarding weight, height and age. (Table 1)

Regarding the ease of the dural puncture, 1724 (90%) of the cases was single shot in G22, while 684(96.06%) cases in G20 ($p > 0.05$).

Regarding the direction of the puncture 1781 (93%) cases were in the midline approach in G22, while 691 (97.05%) cases were in the midline approach in G20, the rest of the cases were by the Paramedian approach ($p > 0.05$).

624 (32.58%) cases developed PDPH in G22, while 234 (32.86%) cases developed PDPH in G20, with the VAS ranging from 3–5 (mild to moderate) starting in the second day and disappearing in the fifth day, few cases persisted to the seventh day 174 (28.88%) cases from 624 in G22 and 72 (30.75%) from 234 in G20, the cases were treated by bed rest, fluids, caffeine and paracetamol (500 mg paracetamol + 65 mg caffeine two tablets every 8 h).

Few cases experienced persistent headache for more than seven days, 43(0.068%) cases in G22 and 18 (0.076%) cases in G20, they all refused the epidural blood patch, and by follow-up they continue their medication and resolved by the day 10.

4. Discussion

Over a period of six months (from February to August 2011) the PDPH incidence in 2627 female patients had cesarean section under spinal anesthesia in kasr el aini teaching hospital was 32.58% and 32.86% using 22 G and 20 G Quinke needles respectively.

Postdural puncture headache is a common complication seen in our practice nowadays in Egypt because of the wide use of spinal anesthesia and the acceptance of the patient. It occurs with a higher incidence in the pregnant female [5,6] and related to the needle size and type, the higher the size the higher the incidence (erased).

The actual cause of the PDPH is not known and there are many theories like the reflex vasodilatation from CSF leakage, dural tracking [6–10].

PDPH usually is mild to moderate and rarely severe to the extent that interfere with the patient life and leave a bad experience with the patient make her refusing spinal anesthesia in the surgeries to come.

Table 1 Biophysical profile of the patients, ease of puncture, direction of puncture, PDPH.

	G22 M ± SD	G20 M ± SD	*P* value
Age (years)	27.65 ± 5.4	28.76 ± 5.9	>0.05
Height (cm)	158 ± 7.5	157.75 ± 8.27	>0.05
Weight (kg)	76.2 ± 15.01	77.61 ± 10.51	>0.05
Single puncture/multiple puncture	1724/1915	684/712	>0.05
Midline/paramedian	1781/1915	691/712	>0.05
PDPH	624(32.58%)	234(32.86%)	>0.05

M = mean, SD = standard deviation with confidence interval 95%, PDPH = postdural puncture headache.

The overall PDPH incidence was 32.58% in the patient with Quinke needle size 22 while it was with 32.86% Quinke needle size 20, also there is no statistical differences between both sizes regarding the midline or Paramedian approach direction ($p > 0.05$), there is no difference between the both groups although we used a bigger size needle (G20), this may be because the incidence of multiple puncture is lower with the wider needle.

The severity was mild to moderate and the patient was compliant with the treatment as it is related to the Arabic traditions regarding drinking coffee and fluids postoperatively, fortunately no case had epidural patch, because all the patients with persistent headache refused the blood patch, which is not accepted among the Egyptians because of fear from blood in the back and expenses.

The results in this study are correlated with the previous studies focusing over the same issue [5,8–13] this is the first study analyzing this issue in the middle east or Egypt, it will add to the data base regarding the developing countries and focus on the patient traditions, economics and suffer [5,13].

The lateral bevel orientation or the expert anesthetist achieving the block from the first shot was not enough to reduce the PDPH incidence in the G22 or G20 needle [8,12].

As a conclusion this study is a documentation of the Cairo University teaching hospital experience with PDPH in female patient undergoes spinal anesthesia, it focus on the incidence and severity related to the needle size and Egyptian population.

There is no difference between the outcome of this study and the previous worldwide studies.

We recommend the usage of the pencil point needle or a smaller needle in Cairo university hospital regarding the economic, teaching and manufacturing reasons.

Conflict of interest

None.

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