

# Post-Dural Puncture Backache (PDPB) in Parturients Undergoing Caesarean Delivery Under Spinal

Caesarean  
Delivery Under  
Spinal  
Anaesthesia

## Anaesthesia: A Cross Sectional Study

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### ABSTRACT

**Objective:** To determine the incidence of lower backache associated with spinal anesthesia given after cesarean delivery.

**Study Design:** Cross-Sectional Study

**Place and Duration of Study:** This study was conducted at the Department of anesthesia, Gujranwala Medical College, Gujranwala from December 2020 to June 2021.

**Materials and Methods:** In this cross sectional study, 300 patients / subjects were included from 20 to 40 of age, who were given spinal anesthesia before the cesarean section. While all the patients who were given any other type of second anesthesia as well after the spinal anesthesia during the course of the study, were excluded. All the patients were interviewed after 24 hours of spinal anesthesia and then after one week when coming for follow-up in the obstetrics out-patient department to examine and diagnose any backache related to spinal anesthesia. Primary outcome was the calculation of incidence of PDPB – backache after spinal anesthesia in patients of caesarian delivery. Outcome was stratified for age, BMI, first pass success and change of needle direction and post stratification chi square test was applied.

**Results:** Among these 300 female, frequency of PDPB was recorded in 14.3% (n=43) of the cases whereas 85.7% (n=257) had no backache related spinal anesthesia. Among patients diagnosed having PDPB (backache), data analysis showed that in 29 (67%) cases more than one attempts were made to insert the needle in the spine. (p value 0.00001).

**Conclusion:** Post-dural puncture backache (PDPB) can be among the common adverse effects of spinal anesthesia used for any type of surgery. Old age, obesity, multiple attempts to pass the spinal needle, bloody CSF and change of space after failure of 1<sup>st</sup> attempt were some factors significantly associated with backache related to spinal anesthesia.

**Key Words:** backache, spinal anesthesia, LSCS, cesarean section, PDPB

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### INTRODUCTION

The complaint of lower back pain (LBP) is very commonly tackled by obstetricians during the pregnancy and also after the delivery of the baby.

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Various surveys have shown that around half of the pregnant population is present in the medical outpatient departments with backache. This LBP is observed for 6 or more months after the delivery of the baby and its incidence varies from 5% to 40%. Previously its etiology was poorly understood, but now few studies are available trying to identify the risk factors of this back ache. Some studies have shown that it may be related to the spinal anesthesia.

A study included around eleven thousand women and reported that the LBP occurred after delivery more frequently among those who were given spinal anesthesia during delivery as compared to those women who were not given spinal anesthesia (19% vs 11%). They showed a significant association of spinal anesthesia with the back pain of the parturient. Most of these studies were just surveys in the form of questionnaires for the evaluation of backache, and were single center study, and most of the confounding

variables were not controlled. In another study, in which patients of caesarian delivery with spinal anesthesia were included, 9.7% had lower back pain and 32.6% parturients manifested headache.

To date, national-level data and large-scale studies are not available regarding the incidence of post-dural puncture backache (PDPB) among the parturients with Vaginal delivery and Cesarean Delivery, this study addressed this gap, and on the basis of the hypothesis that parturients with spinal anesthesia are on a higher risk of developing PDPB, designed this study to explore the link between spinal anesthesia and PDPB.

## MATERIALS AND METHODS

This cross-sectional study was conducted in the department of anesthesia, Gujranwala Medical College, from December 2020 to June 2021. The study population consisted of women undergoing cesarean section with spinal anesthesia. The objective of the study was to determine the incidence of lower backache or PDPB associated with spinal anesthesia given during cesarean delivery

In this study, 300 patients / subjects were included from 20 to 40 of age, who were given spinal anesthesia before the cesarean section. While all the patients who were given any other type of second anesthesia as well after the spinal anesthesia during the course of the study, were excluded. Similarly, patients with symptoms of raised intracranial pressure, those with abnormal spinal bonny structure like scoliosis, infection in the site of spinal anesthesia, patients with coagulation disorders, those with previous history of persistent backache were excluded from the study. Non-probability consecutive sampling was used for the enrollment of cases in the study.

All the patients undergoing cesarean section with spinal anesthesia and meeting the study criteria were selected as subjects of the study. For the purpose of spinal anesthesia disposable 25G spinal needle was used with patient in seated position. 25 µg of fentanyl and 75 mg of lidocaine 5% was used. Spinal anesthesia was given by an unbiased consultant anesthetist unaware of the details of the study, in the presence of the primary investigator. Sample size estimation was done using the WHO sample size calculator by taking an expected incidence rate of backache after spinal anesthesia given for caesarian section of 30% and the confidence interval of 95%.

All the data collected from each of the patient included some of the demographic details like age, weight, height and BMI. During the procedure of spinal anesthesia, first pass success was noted. If first pass success was negative, change of space for needle insertion was also noted by the primary investigator. All the patients were interviewed after 24 hours of spinal anesthesia and then after one week when coming for follow-up in the obstetrics out-patient department to

examine and diagnose any backache related to spinal anesthesia.

Patient was in a sitting position, and midline approach was used to enter the L3–L4 or L4–L5 inter-vertebral space. First pass success was noted along with change of space if done after an unsuccessful first attempt of dural puncture.

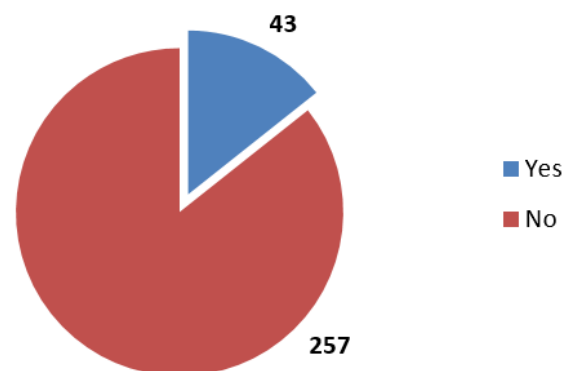
In an attempt to insert the spinal needle in the subarachnoid space, only one skin puncture done with no change in the direction, was considered as first pass success. PDPB – Post-dural puncture backache was defined in terms of continuous pain in the back with tenderness around lumbar area close to the area of spinal needle insertion with not radiating. The presence of backache was recorded along with various factors associated with PDPB were analyzed.

All the data was entered in the data analysis software SPSS-20 software. Frequency and percentage was calculated for various age groups, presence of obesity, first pass success, change of direction of needle, and presence of blood in CSF. Primary outcome was the calculation of incidence of PDPB – backache after spinal anesthesia in patients of caesarian delivery. Outcome was stratified for age, BMI, first pass success and change of needle direction and post stratification chi square test was applied, and p value of  $\leq 0.05$  was taken significance.

## RESULTS

In this cross sectional study, 300 female patients of age 20 to 40 years who had caesarian section through spinal anesthesia were included to diagnose PDPB – backache after spinal anesthesia.

Among these 300 female, frequency of PDPB was recorded in 14.3% (n=43) of the cases whereas 85.7% (n=257) had no backache related spinal anesthesia. Figure no 1 shows a pie chart regarding the incidence of PDPB among our female population included in the study.



**Figure No.1: showing the frequency of post-dural puncture backache among the patients of caesarian section who had spinal anesthesia**

Various risk factors / variables were stratified to see the effect of these on the outcome. Age was grouped into 20 to 30 years and 30 to 40 years. BMI was categorized into less than 30 and more than 30. Any female with BMI of more than 30 was labeled as having obesity. Primary outcome was analyzed in related to the first pass success and change of direction of needle using chi square test.

Among the 43 patients diagnosed having PDPB (backache), data analysis showed that in 29 (67%) cases more than one attempts were made to insert the needle in the spine, while first pass success was observed in rest of the 14 cases. (as shown in table no.1) p value was significant.

Among these 43 patients diagnosed having backache due to spinal anesthesia, 31 (72%) were having obesity while the rest of the 12 cases were having BMI less than 30, showing the the majority of the patients in our study with backache were obese. (as shown in table no.1) p value was significant.

Among these 43 patients diagnosed having backache due to spinal anesthesia, CSF draining inside the spinal puncture needle was blood in 25 cases (58.1%) while the remaining 18 cases had a clear CSF. (as shown in table no.1) p value was significant.

**Table No. 1 showing the significance of various risk factors related to PDPB**

Age				P value
	PDPB Present (%)	PDPB Absent (%)	Total	
20-30	15 (8.3%)	166 (91.7%)	181	0.0002
31-40	28 (23.5%)	91 (76.5%)	119	
BMI (presence of obesity)				
Upto 29.9 - Not obese	12 (6.2%)	193 (93.8%)	205	0.0002
≥30 – Obesity	31 (20.8%)	118 (79.2%)	149	
First pass success				
Yes	14 (6.5%)	204 (94.5%)	215	0.0001
No	29 (34.5%)	55 (45.5%)	84	
CSF (cerebrospinal fluid)				
Clear	18 (6.7%)	243 (93.3%)	261	0.0000
Bloody	25 (64%)	14 (36%)	39	

## DISCUSSION

Post-dural puncture backache (PDPB) is continuous pain around the spinal puncture area without any kind of radiation of pain. The paraspinal muscular relaxation

with stretching of spinal ligaments and/or localized tissue trauma can lead to PDPB. Acute cases of post spinal backache mostly resolve in 7 days. Studies have estimated the effect of needle type, size, design, and use of introducer in spinal needles on post-dural back pain for neuraxial block has been studied. Few of the studies had no difference in PDPB related to needle size and shape. The previous studies about the effect of the introducer needle on back pain showed no significant difference.

The post-dural puncture needle backache can be due spinal anesthesia and it is a major reason of the refusal for spinal anesthesia among females undergoing cesarean delivery. In our study, we investigated the incidence of backache over the first 24 hours after the spinal anesthesia and within the first week of the surgery. Our study reported the incidence of PDPB to be 14.3%, out of total 300 female, 43 females reported backache after caesarian from spinal delivery.

The incidence of PDPB in the literature ranges from 2% to 29% in adults. In a study conducted by Haghghi et al., the incidence rate of backache within the first day, week of surgery was 16% and 9%, respectively. The study conducted by Homairi H et al. reported the incidence of post spinal anesthesia backache in cesarean delivery cases to be 46.5%. Our study reported it to be 14.3%, but it should be done on a larger scale and in various cities and hospitals.

In another similar study, mean age was 20.0 ±5.4 years and post spinal anesthesia backache was reported by 10 patients (5%) in initial 24 hours and in 19 patients (9.5%) over the first week, and significant association was seen between age and backache (P=0.01). Severity was assessed using visual analogue scale (VAS), which was 3.5 ± 0.5. In our study, we didn't collect data regarding the severity of backache. Age, female in labour, previous spinal anesthesia, diabetes, hypothyroidism, body habitus, bony deformity, experience of the provider, occurrence of paranesthesia, contact of spinal needle with bone, duration of surgery, these factors were not associated with lower backache. Our data analysis showed that incidence of backache was higher in a relatively older age group. It was also reported that this backache was significantly associated with body mass index (BMI), quality of spinal landmarks, number of skin punctures and spinal needle redirections, intervertebral space level change, need for taking over by second anesthesia provider, bloody cerebrospinal fluid, presence of PIH and intravenous fluid administered. Our study also showed most of these factors to be significantly with PDPB in our study.

In a study, various needles were compared in terms of complications like backache and headache. Incidence of backache was reported to upto 4.3%. Quincke needle was reported to be cheaper than AtraCaun needle and cost-effective. We used only one type of needle.

Taman Hi, et al reported PDPB of 10.83% among the included obstetric patients. Headache and backache was more in normal weight females as compared to obese and over-weight females. Poor landmarks were also seen to be significantly associated with the frequency of backache in this study and other studies as well. Similar to this study, our study proved that the increased number of skin punctures, needle redirections and more than one needle passes, change in intervertebral space level, and first pass failure are associated with increased in the incidence of backache.

But in another study, the level of spine used for entry into the spine for spinal block, was significantly associated with headache and backache. Not significant factors were labour, provider experience, contact of spinal needle with bone, intraoperative haemodynamic instability, and quality of block, duration of surgery, time to sitting or time to ambulation. Previous history of backache or headache was also included in the insignificant factors.

Some studies have tried to explain the etiology behind backache after spinal anesthesia. Lower back pain is most probably due to ligament tears, tear in the fascia or injury to bone along with localized bleeding, flattening of lumbar convexity to abnormal extent or its immobility, and stretching of lumbosacral ligaments.

While looking for PDPB, primary investigator should look for other causes of backache including epidural hematoma or abscess. Aim of the study was to determine the incidence of lower backache or PDPB associated with spinal anesthesia given during cesarean delivery. This study proved that there is significant number of females of our population who experienced backache related to spinal anesthesia. Backache can start within 24 h of spinal anesthesia and may resolve in a week. Majority of the patients have mild to moderate backache. Treatment of pain can be done through paracetamol and diclofenac.

## CONCLUSION

Post-dural puncture backache (PDPB) can be among the common adverse effects of spinal anesthesia used for any type of surgery. After the caesarian section, multiple factors related to the skills of the anesthetist and related to the body of the patients can be associated. Old age, obesity, multiple attempts to pass the spinal needle, bloody CSF and change of space after failure of 1<sup>st</sup> attempt were some factors significantly associated with backache related to spinal anesthesia.

### Author's Contribution:

Concept & Design of Study: Salman Athar Qureshi  
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**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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