



Gynecology

TO STUDY THE USE OF ULTRASOUND FOR IDENTIFICATION OF INTRATHECAL SPACE IN LUMBAR REGION BEFORE SPINAL ANESTHESIA IN CASE OF CAESAREAN SECTION

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ABSTRACT

Background: "To study the use of ultrasound for identification of intrathecal space in lumbar region before spinal anesthesia in case of CAESAREAN section"

Introduction - Spinal Anesthesia is most commonly given anesthesia in patients of lower segment caesarean section. Spinal anesthesia is a frequently used technique since it creates a quick deep sensory and motor block through the injection of a low dose of local anesthetic to the subarachnoid space. Several factors can cause procedural difficulty during spinal anesthesia like obesity, spinal deformity, and previous spinal surgery. The use of ultrasound in regional anesthesia increases block success and decreases complications.

Method: Prospective observational study conducted at department of obstetrics & gynaecology, GSVM Medical College Kanpur. 100 pregnant patients planned for elective LSCS were included in the study and were divided into two groups – Group I (n=50) those where intrathecal space identified by palpation and Group II (n=50) where intrathecal space identified by ultrasound.

Results- Number of attempts for successful blocks was less in Group II. The successful blocks on 1st needle attempt in Group II (36%) was significantly more than Group I (nil). However, complications like paresthesia during procedure, bloody tap or traumatic puncture were less in Group II but Total procedural time was more.

Conclusion: The identification of intrathecal space by ultrasound before spinal anesthesia in cesarean section significantly decreased the number of needle insertion, led to successful blocks and also decreased the incidence of complication but take longer time to complete the spinal procedure as compared to palpatory method.

Still the identification of intrathecal space by palpation remain to be the gold standard for routine spinal procedure in uncomplicated cases as total time taken for the procedure is always less by palpatory method.

KEYWORDS :**INTRODUCTION-**

Spinal anesthesia is most preferable anesthesia given for lower segment cesarean section (LSCS).

Spinal anaesthesia creates a quick deep sensory and motor block through the injection of a low dose of local anesthetic to the subarachnoid space.

- Central neuraxial blockades (CNBs) are performed using a combination of –
 - surface anatomical landmark,
 - the operator's perception of tactile sensation (loss of resistance), and/or
 - visualizing the free flow of CSF.
 - The spinous processes are relatively reliable surface anatomical landmarks in many patients, they are not always easily recognizable in patients with obesity, edema, underlying spinal deformity, or previous back surgery.
 - Regarding obstetric patients,
1. the interspinous ligament becomes softer and inhomogeneous causes a false sense of loss of resistance,^{1,2}
 2. the distance from the skin to the epidural space increases, the potential gap is reduced and the interspinous space ascends at a steeper angle,²
 3. weight gain, pelvic rotation, hyperlordosis, tissue edema, and suboptimal positioning.

All predisposes to difficulty in the performance of neuraxial block during pregnancy and procedure related complications.

- Recently, ultrasound (US) imaging of the spine has emerged as a useful method of overcoming many of these shortcomings of the surface landmark-guided approach to CNBs.
- The use of US for needle insertion^{3,4,5}

- 1) reduces the number of puncture attempts,

- 2) improves the success rate of spinal block on the first attempt,
- 3) reduces the need to puncture multiple levels, and
- 4) improves patient comfort during the procedure.

METHODS-

Prospective study with random allocation of patients conducted from January 2017 to August 2018 at Obs. and Gynaedept., GSVM Medical college Kanpur.

- Informed patient consent and approval from the ethical committee was received.
- Study included 100 pregnant patients planned for elective LSCS, divided into two groups.
- Group I (n=50): those where intrathecal space were identified by palpation,
- Group II (n=50): those where intrathecal space were identified by ultrasound.

OBSERVATIONS-**Table 1: Demographic Profile**

		Group I (n=50)		Group II (n=50)		
		No.	%	No.	%	
AGE (years)	18-25	15	30	16	32	P=0.887
	25-35	32	64	30	60	
	>35	3	6	4	8	
PARITY	Primigravida	29	58	26	52	P=0.687
	Multigravida	21	42	24	48	
Socioeconomic status	Low	8	16	6	12	P=0.2229
	Middle	41	82	39	78	
	High	1	2	5	10	
Residential status	Rural	48	96	40	80	P=0.0277
	Urban	2	4	10	20	

Table 2: Comparison of number of attempts

No. of attempts	Group I (n=50)		Group II (n=50)		P<0.0001
	No.	%	No.	%	
1	-	-	18	36	P<0.0001
2	2	4	23	46	
3	6	12	7	14	
4	10	20	1	2	
>4	28	56	1	2	
Failed	4	8	-	-	

Table 3: Comparison of Total Procedural Time

Total procedural time	Group I (n=50)		Group II (n=50)		P<0.0001
	No.	%	No.	%	
1-3min	8	16	-	-	P<0.0001
3-5min	15	30	3	6	
5-10 min	23	46	18	36	
10-20 min	4	8	29	58	

Table 4: Complications of spinal anesthesia

Complications	Group I (n=48)		Group II (n=50)		P<0.0001
	No.	%	No.	%	
Present	33	68.75	6	12	P<0.0001
Absent	15	31.25	44	88	
Specific Complications	Group I (n=33)		Group II (n=6)		P=0.1454
	No.	%	No.	%	
Hypotension	11	22.91	5	10	P=0.0011
Blood in spinal needle	11	22.91	-	-	
Periprocedural pain	6	12.5	1	2	P=0.1041
Post dural puncture headache (PDPH)	5	10.41	-	-	P=0.051

Table 5: Anesthetist's Satisfactory Level

Anesthetist's Satisfactory Level	Group I (n=50)		Group II (n=50)		p<0.0001
	No.	%	No.	%	
Satisfactory	22	44	44	88	p<0.0001
Partial satisfactory	25	50	6	12	
Unsatisfactory	3	6	-	-	

RESULTS -

Demographic profile of patients in both the groups were comparable (Table 1).

In Group I, number of attempts for successful block was >4 in most of the patients whereas in Group II, maximum number of the patients required 2 attempts with no failed attempts (Table 2).

In Group II, majority of patients require total 10-20 minutes whereas most of the patients in Group I require only 5-10 min. to complete the procedure which was statistically very significant. (Table 3)

Majority of the patients in Group I were complicated and had adverse outcome as compared to Group II where most of the patients had no complication which was statistically highly significant. (Table 4)

Preprocedural ultrasound imaging (Group II) increased the satisfactory level of most of the anesthetic in comparison to satisfactory level of Group I as preprocedural ultrasound imaging increased the incidence of first pass success, improve the ease of insertion and minimize the traumatic trials. (Table 5)

DISCUSSION:

According to demographic profile, both the groups were comparable as there was no confounding factor between the two groups which was similar to the study conducted by Farhat Naz et al⁹ 2009 in which 300 consecutive patients who underwent caesarean section under spinal anesthesia were found that majority of the patients i.e. 60.67% (n=182) were between 25-30 years, 22.33% (n=67) were between 20-25 years and their parity distribution revealed 40.44% (n=121) patients multigravida and 59.67% (n=179) primigravida.

In this study, total number of attempts were statistically lower in group II which was comparable to study done by Dhangar Sangeeta et al⁷

(2018) which included 100 parturients for elective caesarean section under spinal anesthesia and concluded that the number of attempts for needle insertion (1.04 ± 0.19 vs. 1.97 ± 0.77), was significantly less in Group U (ultrasound-guided technique) as compared to Group L (landmark technique). Similarly Ahmed M Hasanin et al⁹ (2017) also reported lower number of puncture attempts (1 [1, 1.25] vs. 1.5 [1, 2.75], $P=0.008$) in ultrasound guided group.

In this study, total procedural time for performing successful block was comparatively more in group II which was comparable to the study conducted by AykutUrfalioğ et al⁹ (2016) who concluded that total procedure time (TPT) was significantly longer in the ultrasound than in the landmark group ($p<0.001$) (8 ± 2 and 5 ± 1 ; respectively).

In our study, complication rate were significantly lower in group II which was comparable with the study conducted by Shaikh et al¹⁰ (2013) who concluded that there was 73% reduction in the risk of traumatic procedures with the use of US.

In this study, there was no case of post dural puncture headache (PDPH) in ultrasound guided spinal anesthesia. Similarly Grau et al¹¹ (2002) also observed a significant reduction in the rate of postpartum headache (4.7% vs. 18.7%) and backache (14.7% vs. 22.0%) with US-assisted epidural insertion. Hence ultrasound may potentially reduce adverse effects related to spinal anesthesia.

In our study between group I and group II, the Anesthetist was more satisfied in group II. Hence preprocedural ultrasound imaging increased the incidence of first pass success and improve the ease of insertion and minimize the traumatic trials as compared to manual palpation method.

CONCLUSION-

The identification of intrathecal space by ultrasound before spinal anesthesia in caesarean section significantly decreased the number of needle insertion, led to successful blocks and also decreased the incidence of complication but take longer time to complete the spinal procedure as compared to palpation method.

Still the identification of intrathecal space by palpation remain to be the gold standard for routine spinal procedure as dependency on modern, sophisticated gadgets can improve the accuracy of procedure but our clinical skill are indispensable which is also shown in our study because total time taken for the procedure is always less when given by palpation method.

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