



EFFICACY OF PRE-PROCEDURAL ULTRASOUND TO LOCATE LUMBAR SPINE FOR SPINAL ANAESTHESIA IN OBESE PREGNANT PATIENTS

Anaesthesiology

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ABSTRACT

Background: Identification of the intervertebral level is an essential component of spinal anaesthesia. Ultrasound can accurately detect the lumbar interspace in obese patients in whom landmarks are difficult to palpate. **Methodology:** A prospective observational study conducted in Govt Medical college, Thrissur for a period of one year, randomly assigned seventy patients with BMI ≥ 30 kg/m² undergoing elective cesarean section into two groups. one group underwent ultrasound lumbar spine and palpatory method was used to obtain interspace in second group. Number of punctures, redirections and procedure time recorded. **Results:** The mean number of punctures and redirections were significantly lower (p value < 0.05) in ultrasound group. More time required to locate the landmarks using ultrasound was counteracted by less spinal anaesthesia performance time (p value < 0.05) in ultrasound group. **Conclusion:** pre-procedural ultrasound can facilitate successful spinal anaesthesia in obese parturients and shorten procedure time

KEYWORDS

ultrasound, spinal anaesthesia, obese, pregnant

INTRODUCTION

The population of obese individuals is escalating around the globe. Hence the number of obese parturients undergoing caesarean section is also increasing. Regarding anaesthetic management in obese, appropriate planning should be done. Regional anaesthesia has an upper hand as maternal obesity may increase the chance of difficulty in intubation, pulmonary aspiration, and hypoxia during general anaesthesia. Identification of the intervertebral level is an essential component of spinal anaesthesia. Accurate identification of the subarachnoid space is paramount as multiple punctures may cause patient discomfort, increased incidence of spinal hematoma, postdural puncture headache, and neural injury. But the increased amount of subcutaneous adipose tissue can pose difficulty to obtain the landmarks for spinal anaesthesia.

Broadbent et al demonstrated that anaesthesiologists could identify a particular intervertebral space correctly by palpation in only 29% case⁽¹⁾. This discrepancy may result from inappropriate association between intercristal line. Determined by palpation and Tuffier's line. Tuffier's line is the transverse line joining the superior aspects of the iliac crests, and it commonly intersects the spine at the level of the body of L4 vertebra or the L4-L5 interspace⁽²⁾.

Ki Jinn Chinn conducted a study in 120 orthopedic patients with difficult surface anatomical landmarks⁽³⁾. Success of spinal anaesthesia upon first attempt of needle puncture was twice as high after a pre-procedural ultrasound scan compared to manual palpation (65% Vs 32%)

OBJECTIVES

To compare the efficacy of pre-procedural ultrasound to conventional palpatory method in locating lumbar spine for spinal anaesthesia in obese pregnant patients

MATERIALS AND METHODS

A prospective observational study was conducted in Govt Medical College Thrissur for a period of one year after obtaining ethical committee approval and written informed consent from the patients.

Inclusion Criteria

- Patients undergoing elective caesarean under spinal anaesthesia
- Patients with BMI ≥ 30 kg/m²

Exclusion Criteria

- ASA $\geq$ III
- Patients contraindicated for neuraxial blockade
- emergency CS
- allergy to local anesthetics

Sample size was calculated based on a study by Ki Jinn Chinn⁽³⁾ and rounded off to 70. candidates were assigned into 2 groups of 35 each.

One group underwent ultrasound lumbar spine and palpatory method

was used to obtain interspace in second group.

Ultrasound lumbar spine was performed with sonosite and a low frequency curved probe (2-5 MHz) oriented longitudinally to get a parasagittal oblique view of lumbar spine in which L2-L3 to L4-L5 space can be marked. The probe was rotated 90 degree to get transverse view of lumbar spine where intrathecal space could be visualised between posterior dura and the body of vertebra^(4,5). Number of needle punctures, redirections and procedure time was recorded.

Statistical Analysis

The collected data were coded and entered into the IBM SPSS Statistics, Version 20.0, a statistical package software program

Standard deviation and mean was calculated and compared using unpaired t test for quantitative variables. For all statistical evaluation, p < 0.05 was considered significant

RESULTS

Table 1: comparison Of Quantitative Variables Between Two Groups

	Ultrasound group	Palpatory group	p value
Number of punctures	1.25 $\pm$ 0.44	2.22 $\pm$ 0.84	0.001
Redirections	1.28 $\pm$ 0.86	3.65 $\pm$ 1.43	0.001
Time taken to locate space	2.06 $\pm$ 0.47	1.72 $\pm$ 0.54	0.008
Procedure time	3.60 $\pm$ 0.49	4.73 $\pm$ 1.01	0.001

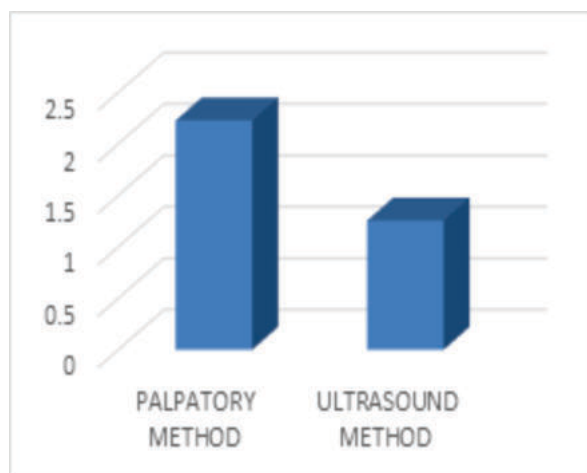


Figure 1: Mean Number Of Needle Punctures Between Two Groups

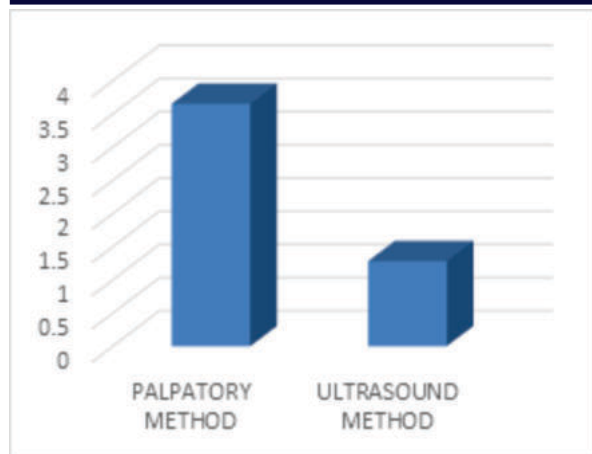


Figure 2: Mean Number Of Needle Redirections Between Two Groups

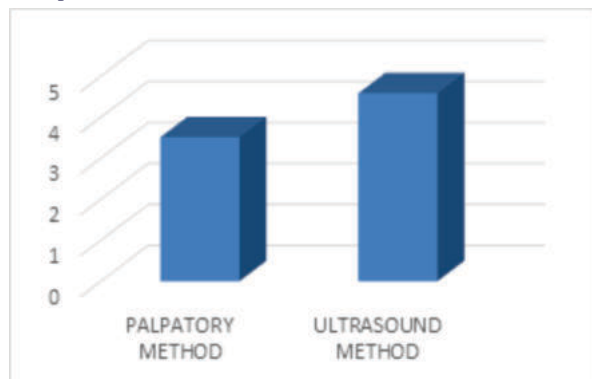


Figure 3: Comparison Of Time Taken To Locate Interspace

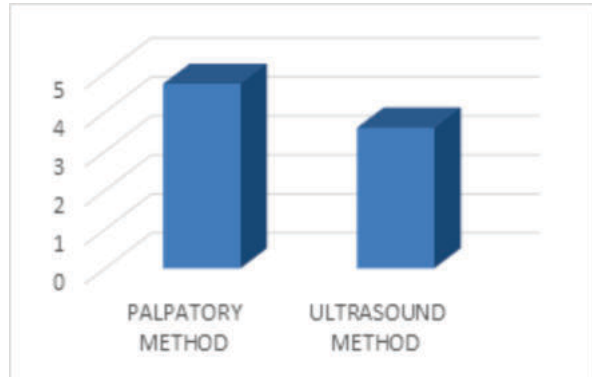


Figure 4: Comparison Of Procedure Time Between Two Groups

DISCUSSION

Sociodemographic data of both groups were comparable. The mean number of punctures was found to be significantly lower (p value 0.001) in ultrasound group (1.25 ± 0.44) than palpatory group (2.22 ± 0.84) and the number of needle redirections was lower with ultrasound group (1.28 ± 0.86) than palpatory group (3.65 ± 1.43) which was statistically significant. Study conducted by Dhager, S, Vinayagam, S⁽⁶⁾ among 50 elective caesarean candidates showed the same observations

More time was required to locate the landmarks using ultrasound (4.58 ± 1.09 minutes). In palpatory group, the time taken to locate the space was 3.514 ± 1.05 minutes which was statistically significant. But this was partially counteracted by less spinal anaesthesia performance time in ultrasound group (3.606 ± 0.491 minutes) compared to palpatory group (4.731 ± 1.017 , p value 0.001). These results were consistent with studies done by Chinn et al⁽⁵⁾

Cesarean deliveries are more prevalent in obese parturients and neuraxial anesthesia is the preferred choice to avoid airway manipulation. preprocedural scan allows the operator to identify the

midline and accurately determine the interspace for needle insertion^(7,8)

CONCLUSION

pre-procedural ultrasound is beneficial to find landmarks to facilitate successful spinal anaesthesia in obese parturients undergoing LSCS resulting in less number of punctures, needle redirections and time.

Conflict Of Interest: NIL

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