ISSN: 0975-3583, 0976-2833 VOL15, ISSUE4, 2024

Original Research Article

A STUDY TO EVALUATE BENEFIT OF VISUAL AID IN ACHIEVING PROPER POSITIONING FOR NEURAXIAL ANAESTHESIA

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Abstract

Background & Methods: The aim of the study is to evaluate benefit of visual aid in achieving proper positioning for neuraxial anaesthesia. The anaesthesiologist will prepare the spinal tray and drugs under aseptic conditions, prepare and drape the patient's back. A second person will start the timer and read out the standardized verbal instructions with or without visual aids, according to the allocation group of the patient. The patient will adopt the required position, and the anaesthesiologist will commence the procedure.

Results: Group 1 required a second anesthesiologist to successfully complete the procedure in 25 patients out of 30 (90%) patient whereas 28 cases of group 2 (93.3%). The chi-square statistic is 1.4555. The *p*-value is .027643. The result is significant at $p < .05$.

Conclusion: We concluded that the use of visual aids to assist positioning for neuraxial blockade reduced the time taken for the procedure by an average of 2 min and also reduced the number of skin punctures required.

Keywords: visual, positioning, neuraxial & anaesthesia.
Study Design: Randomised Controlled Interventional study.

1. Introduction

Anaesthesiologists traditionally perform neuraxial block utilizing landmark based techniques and the most significant predictor of the difficulty in performing them has been reported to be the quality of these landmarks[1]. Besides landmark quality, patient positioning can also independently predict the success of performing neuraxial anaesthesia.

Patients are often verbally instructed by the anaesthesiologist to adopt an optimal position for neuraxial blocks. Difficulty can be encountered in achieving the best position if patients misunderstand these instructions[2]. This may lead to a delay in performing the procedure and increase the technical difficulty with a possible increased risk of complications. Multiple punctures can lower patient satisfaction and may lead to complications such as hematoma, paraesthesia and nerve injury as well as post-dural puncture headache[3].

Although there have been many studies discussing the predictors for a difficult neuraxial blockade, few studies have looked at techniques to minimize these difficulties[4-5]. Ultrasound has been investigated; however, this technique requires specific training and expertise.

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2. Material and Methods

Source of data:-
The present study will be conducted in the Department of Anaesthesiology, People's Hospital associated with People's College of Medical Sciences & Research Institute in patients requiring Subarachnoid block and epidural anaesthesia, after approval by an institutional ethical committee and written informed consent. Following intravenous cannulation and application of standard monitoring, the participants will be requested to sit in the upright position on the operating table, and shoulders gently supported by an assistant. No further assistance in positioning or any verbal prompting will be provided. No sedative or anxiolytic premedication will be administered to the participants, due to possible interference with their comprehension.
The anaesthesiologist will prepare the spinal tray and drugs under aseptic conditions, prepare and drape the patient's back. A second person will start the timer and read out the standardized verbal instructions with or without visual aids, according to the allocation group of the patient. The patient will adopt the required position, and the anaesthesiologist will commence the procedure. An observer will record the relevant data.
Sample size:- 60 patients will be randomized into two groups of 30 each.

1. Group 1(n =30) Will receive standardized verbal instructions
2. Group 2 (n =30) Will receive standardized verbal instructions along with visual image to achieve positioning for spinal anesthesia

Blinding: Blinding will not be possible due to the nature of the intervention.
Inclusion criteria:-
1) Informed consent
2) ASA grades 1 & 2
3) Below umbilical surgeries
4) Age group 20-60 years
5) Weight- 40 to 70 kg

Exclusion criteria:-
1) Patient refusal
2) Patient with spine deformity
3) Local site skin infection
4) Emergency cesarean section
5) Inability to comprehend Hindi and English
6) Any contraindication to neuraxial anesthesia
7) Body mass index (BMI) greater than 25 kg/m2
8) Pt. prior experience with neuraxial blocks

3. Result

Table No. 1: Demographic Profile

Parameters	Verbal	Verbal and visual	P Value
Gender			
Male	**17**	**08**	
Female	**13**	**22**	.018435
Education			

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Primary	**09**	**06**	.371093
Secondary	**19**	**23**	
Tertiary	**02**	**01**	

Age in years (mean) in Verbal (67) & Verbal and visual (64)
The chi-square statistic is 5.5543. The *p*-value is .018435. The result is significant at $p < .05$.
The chi-square statistic is 0.8. The *p*-value is .371093. The result is *not* significant at $p < .05$.

Table No. 2: Number of intervertebral spaces

Number of intervertebral spaces	Verbal	Verbal and visual	P Value
01	**13**	**18**	
02	**08**	**06**	
More than 03	**09**	**06**	.039377

Time Taken for Success Spinal (median) Verbal 291(sec) & Verbal and visual 173 (sec)
The chi-square statistic is 1.0333. The *p*-value is .039377. The result is significant at $p < .05$.

Table No. 3: Patient Satisfaction

Patient Satisfaction	Verbal	Verbal and visual	P Value
Dissatisfied	**01**	**01**	
Neutral	**03**	**04**	
Satisfied	**11**	**06**	.048963
Very Satisfied	**15**	**19**	

The chi-square statistic is 1.4639. The *p*-value is .048963. The result is significant at $p < .05$.

Table No. 4: Number of skin punctures

Number of skin punctures	Verbal	Verbal and visual	P Value
01	**12**	**18**	
02	**11**	**05**	.178173
More than 03	**07**	**07**	

Anesthesiologists varied significantly by instruction group. Out of the participants in group 2, % required ≤2 skin punctures and % required ≥3 skin punctures compared to % and % of the participants in group 1 respectively. The chi-square statistic is 3.45. The *p*-value is .178173. The result is *not* significant at $p < .05$.

Table No. 5: Successful

Successful	Verbal	Verbal and visual	P Value
Yes	**25**	**28**	.027643
No	**05**	**02**	

Group 1 required a second anesthesiologist to successfully complete the procedure in 25 patients out of 30 (90%) patient whereas 28 cases of group 2 (93.3%). The chi-square statistic is 1.4555. The *p*-value is .027643. The result is significant at $p < .05$.

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Table No. 6: Experience of Anaesthesiologist

Experience of Anaesthesiologist	Verbal	Verbal and visual	P Value
< 6 months	**04**	**05**	.145569
6 mths- <2 years	**03**	**01**	
2+ years	**21**	**16**	
Consultant	**02**	**08**	

The chi-square statistic is 5.3868. The *p*-value is .145569. The result is *not* significant at $p < .05$.

4. Discussion

To our knowledge, this is the first study to consider the use of a simple and practical aid such as visual images to assist positioning for spinal blocks in a general surgical population. Unlike the previous study [6], we have investigated the effects of possible confounders such as experience of anesthesiologists, educational status of patients. We excluded patients with any prior neuraxial experience. We also did not attempt to blind the anesthesiologists to the nature of intervention as per earlier study [7-9], to ensure that we measure the usefulness of our intervention in actual clinical practice and increase external validity of our findings. We decided to investigate its use only in spinal anesthesia (rather than epidural anesthesia), as the free flow of CSF is a definite endpoint that enabled us to measure the time to success with precision [10].

The ease of the interspinous space identification was also similar across the positions.

5. Conclusion

We concluded that the use of visual aids to assist positioning for neuraxial blockade reduced the time taken for the procedure by an average of 2 min and also reduced the number of skin punctures required.

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ISSN: 0975-3583, 0976-2833 VOL15, ISSUE4, 2024

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