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Original Research Article

COMPARISON OF TRADITIONAL SITTING POSITION WITH CROSSED LEG SITTING POSITION FOR THE EASE OF INSERTION OF EPIDURAL CATHETER FOR PROVIDING LABOUR ANALGESIA IN HIGH BMI PATIENTS

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ABSTRACT:

INTRODUCTION: Pain relief in labour is complex and often challenging. There are many methods of pain relief during labour but Epidural analgesia is the most effective method of providing pain relief. The patient's position during the insertion of the epidural needle plays a major role in the success of labour epidural analgesia. This study was done to discover any correlation between traditional sitting position (TSP) or crossed-legged sitting position (CLSP) with ease of insertion of the epidural catheter.

OBJECTIVES:

Primary objective - To compare number of successful 1st attempt at epidural placement in between these two groups.

Secondary objective- To compare ease of landmark palpation, number of needle bone contact and patient comfort in between these two groups.

MATERIALS AND METHOD: We studied 100 patients who were scheduled for normal vaginal delivery and 50 patients each were divided into two groups.

Group TSP patients received epidural catheter placement in the traditional sitting position wherein the patient sat on the side of the O.T table with her feet propped up on a chair and hugging a pillow.

Group CLSP patients received epidural catheter placement in a crossed leg sitting position with knee and hip flexed and hugging a pillow.

Data was compared with respect to hemodynamic parameters, successful 1st attempt at epidural placement, ease of landmark palpation, number of needle bone contact and patient comfort in between these two groups.

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RESULT: We found that in between these two groups successful 1st attempt at epidural placement was statistically significant (p-value 0.012); ease of landmark palpation, needle bone contact and patient comfort was also statistically significant in between these groups with p-value of 0.037, 0.008, and 0.004 respectively.
CONCLUSION: We concluded that crossed leg sitting position yielded better results than traditional sitting position in providing ease of insertion of epidural catheter for providing labour analgesia.

KEY WORDS: Labour pain, Normal vaginal delivery, Epidural analgesia

1. INTRODUCTION:

There are many treatment modalities available for management of labour pain i.e., nonpharmacologic methods which includes psychoprophylaxis (Lamaze method), emotional support, back massage, hydrotherapy, acupuncture, and hypnosis (hypnobirthing), biofeedback, transcutaneous electrical nerve stimulation (TENS) etc. Scientific assessment of these methods has yielded inconsistent results. These techniques tend to work early in the first stage of labour when the pain is least intense and may decrease pharmacologic use at that time[1]. Pharmacologic treatment options include parenteral opioids[2] (they readily cross the placental barrier and may cause neonatal respiratory depression depending), regional analgesia (epidural, spinal, combined spinal-epidural, paracervical, caudal, and pudendal nerve blocks), and inhalational analgesia[3]. Epidural analgesia is thought to be the most effective method of providing pain relief in labour. According to Silva, Marcos, and Stephen H Halpern (2010), in first and second stages of labour epidural block gives significantly more analgesia than parenteral opioids evaluated by visual analogue scale[4]. The patient's position during epidural needle insertion is critical to the success of labour epidural analgesia. Afolayan, Jide Michael et al (2017) in his study on induction of spinal anaesthesia in various patient's positions concluded that patient's position during administration of neuraxial anaesthesia can change the success rate of the procedure and provide desirable results[5]. Patient's position during induction is of paramount importance as poor positioning will lead to multiple needle- bone contact, multiple needle insertion attempts, higher chances of post dural puncture headaches (PDPH), hematoma and neural trauma while better positioning will lead to optimal lumbar flexion and make spinal needle placement relatively easier. Fernández, Sabela Del Río et al (2010), in his study on spinal anaesthesia performed in sitting position and lateral decubitus position and found that the incidence of paraesthesia was more in lateral decubitus position and also with number of attempts. They concluded that patient's position during induction can influence the number of attempts and thereby complications[6]. Anaesthesiologists should always strive to minimize iatrogenic injury to patients in order to avoid these unnecessary complications[7]. Suman Rajagopalan et al (2019) concluded in his study on epidural analgesia for labour that inability to palpate the spinous process contributes to multiple attempts for epidural placement because in patients with palpable spinous process were 3.3 times more likely to have a successful first attempt at epidural placement regardless

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of provider experience[8].The traditional sitting position (TSP) or lateral position are the commonly used position for placing the epidural catheter for labour analgesia. The crossed-legged sitting position (CLSP) is one of the alternative positions for the administration of regional anaesthesia which is not used on a routine basis.

2. MATERIALS AND METHODOLOGY

The present study entitled "Comparison of traditional sitting position with crossed leg sitting position for the ease of insertion of epidural catheter for providing labour analgesia in high BMI patients" was conducted in the Department of Anaesthesiology, Shyam Shah Medical College & associated Sanjay Gandhi Memorial and Gandhi Memorial Hospitals, Rewa (M.P.) from January 2021 to September 2022 (21 Months) after approval by institutional ethics committee and obtaining written informed consent. . Pre-anaesthetic examination of the patients was done. Each patient was subjected to complete general physical and systemic examination and detailed history was taken. Basic demographic characteristics such as age, height, sex, weight and BMI were noted. The patient was explained about the procedure and shifted to the operation theatre. The study design was prospective and randomized with a sample size of 100 patients who are randomly divided into two groups: GROUP TSP (n=50) where patients received epidural catheter placement in the traditional sitting position wherein the patient sat on the side of the O.T table with her feet propped up on a chair and hugging a pillow and GROUP CLSP (n=50) where patients received epidural catheter placement in a crossed leg sitting position with knee and hip flexed and hugging a pillow. Under all aseptic precautions, 16 G epidural catheter was placed in L3-4 or L4-5 space using the loss of resistance technique and the catheter was threaded cephalad 5 cm into the epidural space. After negative aspiration of blood and CSF, 20 ml dose of the study medication (20 ml of 0.125% bupivacaine with 0.5mcg/kg of fentanyl) was administered. After the first bolus of analgesic drug, this epidural catheter was used to give top-up of 5-10 ml of 0.125% of bupivacaine every 60-120 minutes. If the placement was successful in the very first attempt score 0 was given, withdrawal of needle up to the skin and change in direction/ reinsertion on the same level/ reinsertion of needle on a different was considered as new attempt (unsuccessful first attempt) and score 1 was given. Difficulty of landmark palpation was classified as: Score 1 for easily palpable (the lower border of the superior spinal process and the upper border of the inferior spinal process clearly palpable), Score 2 for hardly palpable (the lower border of the superior spinal process and the upper border of the inferior spinal process not palpable) and Score 3 for impalpable (the spinal process could not be palpated). For Needle bone contact assessment Score 0 was given if there is no needle bone contact and Score 1 was given if there was any needle bone contact. For patient comfort score with positioning, score 0 was given if the patient was comfortable with the positioning and score 1 was given if any discomfort is experienced. For Statistical Analysis Microsoft Word and Microsoft Excel (2013 version) were used to enter data and generate graphs, tables, and charts. The data was analyzed using the trial version of IBM SPSS Statistics for Windows, Version 20. IBM Corp, Armonk, NY, USA and presented as means with standard deviation

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(SD) and categorical variables were presented as percentages. The student's t-test was used for testing the significance of the mean in both groups for age, height, heart rate, weight, BMI, SBP, DBP, SpO2, VAS score. The Chi-square test is used to determine the significance in the categorical data (Mode of delivery, successful first attempt, needle bone contact, difficult landmark palpation and patient comfort score) All the statistical results were considered significant at the p-value <0.05.

3. RESULTS

The mean age of patients of Group TSP and Group CLSP were 26.22 ± 2.84 and 27.24 ± 2.88, respectively, on comparison which was statistically insignificant (p=0.078). Similarly, mean heights of Group TSP and Group CLSP were 1.62 ± 0.03 and 1.61 ± 0.03 respectively, for which the mean difference was statistically insignificant (p=0.879). Mean weights of Group TSP and Group CLSP were 81.56 ± 3.33 and 81.76 ± 3.20 respectively, for which the mean difference was statistically insignificant (p=0.76). Mean BMI of Group TSP and Group CLSP were 31.23 ± 0.71 and 31.35 ± 0.78 respectively, for which the mean difference was statistically insignificant (p=0.4). Mean heart rate of Group TSP and Group CLSP were gradually decreasing for initial 30 minutes of follow ups when compared to baseline and then reaching a stable state. Mean differences at different at different time interval in between these two groups were comparable and statistically insignificant (p-value more than 0.05). Mean SBP of Group TSP and Group CLSP were gradually decreasing for initial 30 minutes of follow ups when compared to baseline and then reaching a stable state Mean differences at different at different time interval in between these two groups were comparable and statistically insignificant (p-value more than 0.05). The mean DBP of Group TSP and Group CLSP were gradually decreasing for initial 30 minutes of follow ups when compared to baseline and then reaching a stable state. Mean differences at different at different time interval in between these two groups were comparable and statistically insignificant (p-value more than 0.05). Mean difference in between these two groups were comparable at all time intervals during follow ups and statistically insignificant (p-value more than 0.05). The mean VAS score before procedure for Group TSP and group CLSP were 6.08±1.12 and 6.34±1.17 respectively. The mean VAS scores 5 min after procedure for Group TSP and Group CLSP were 1.42±0.70 and 1.18±0.48 respectively. Mean VAS score of Group TSP and Group CLSP decreased after 5 minutes of epidural analgesia. All mean difference were statistically insignificant. The mode of delivery of Group TSP and Group CLSP, the majority of patients of both Group TSP (92%) and Group CLSP (96%) had normal vaginal delivery (NVD), while a small percentage of study population of Group TSP and Group CLSP had ventouse delivery (4% and 2% respectively), and similarly for Group TSP and Group CLSP lower segment caesarean section (LSCS) percentages were 4% and 2% respectively. All mean difference were statistically insignificant (p=0.701).

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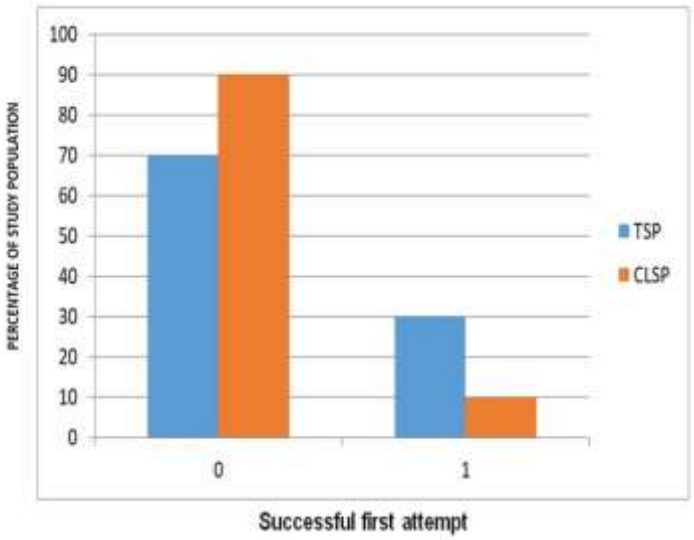
TABLE-1: Successful first attempt comparison in between both the groups.

Successful first attempt	Group		Chi square	P value
	TSP	CLSP		
	N (%)	N (%)		
0	35(70%)	45 (90%)	6.25	0.012
1	15(30%)	5(10%)		

TABLE-1 depicts the comparison of Group TSP and Group CLSP in terms of successful first attempt, if the placement was successful, score 0 was given, and if not score 1 was given. Percentage of successful first attempt was 90% in CLSP Group and 70% in TSP Group.



GRAPH-1: Graphical presentation of percentage of successful first attempt comparison between both the groups.

TABLE-2: Needle bone contact comparison in between both the groups.

Needle bone contact	Group		Chi square	P value
	TSP	CLSP		
	N (%)	N (%)		

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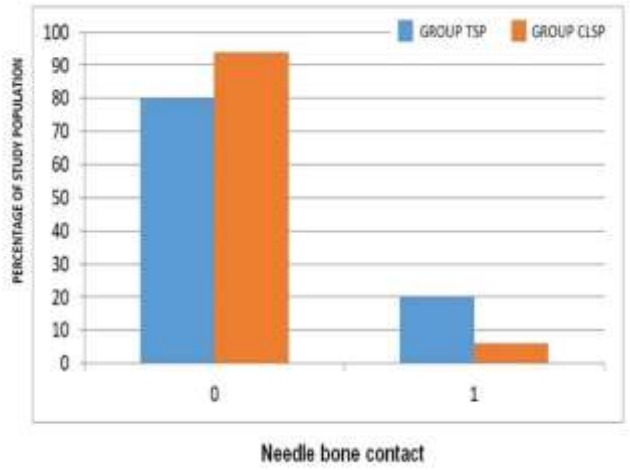
0	40(80%)	47(94%)	4.33	0.037
1	10(20%)	3(6%)		

TABLE-2 depicts the comparison of Group-TSP and Group-CLSP in terms of needle bone contact. Percentage of study population who got no needle bone contact while placing epidural was 94% in Group-CLSP and 80% in Group-TSP. The difference was statistically significant (p=0.037)



GRAPH-2: Graphical presentation of Percentage of needle bone contact comparison between Group TSP and Group CLSP.

TABLE-3: Difficulty in landmark identification comparison in between both the groups.

Difficulty in landmark identification	Group		Chi square	P value
	TSP	CLSP		
	N(%)	N(%)		
1	29(58%)	43(86%)	9.76	0.008
2	11(22%)	4(8%)		
3	10(20%)	3(6%)		

TABLE-3 depicts the comparison of Group TSP and Group CLSP in terms of difficulty in landmark identification. Percentage of study population who were easily palpable while

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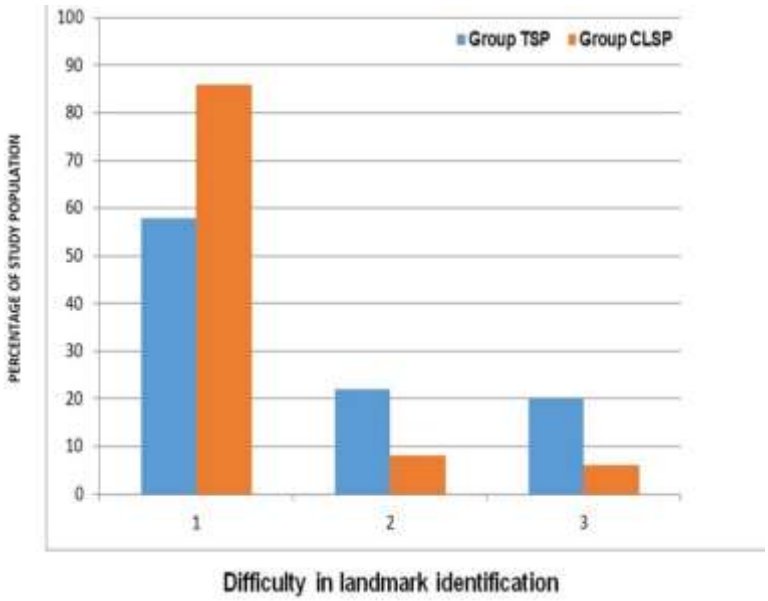
placing epidural was 86% in Group CLSP and 58% in Group TSP. In 8% of Group CLSP study population we got difficult palpation (in Group TSP it was 22%). In 6% of Group CLSP study population we got impalpable (while in group TSP 20% of study population we got impalpable), this difference in between these two groups was statistically significant (p=0.008).



GRAPH-3: Graphical presentation of Percentage of difficulty in landmark identification in between both the groups

TABLE-4: Patient comfort score comparison in between both the groups.

Patient comfort score	Group		Chi square	P value
	TSP	CLSP		
	N (%)	N (%)		
0	33 (66%)	45 (90%)	8.39	0.004
1	17 (34%)	5 (10%)		

TABLE-4 depicts the comparison of Group-TSP and Group-CLSP in terms of patient comfort score. Percentage of study population who were comfortable with the positioning while placing epidural was 90% in Group-CLSP and 66% in Group-TSP. The difference was statistically significant (p=0.037)

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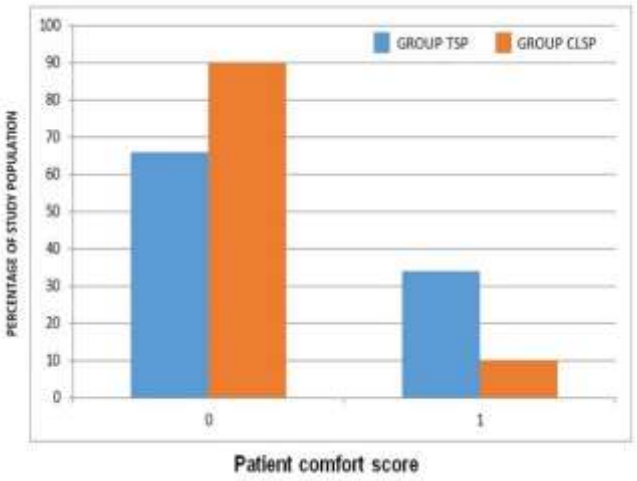

GRAPH-4 : Graphical presentation of Percentage of patient comfort score in between Group TSP and Group CLSP.

4. DISCUSSION

In the present study demographic parameters like mean age, gender, mean height, mean weight and mean BMI were comparable, with a p-value of more than 0.05 which was statistically insignificant. Hemodynamic parameters mean HR, mean SBP, mean DBP, mean SPO2 levels were comparable, with a p-value of more than 0.05 which was statistically insignificant. VAS scores before the procedure and 5 min. after the procedure in both the groups were comparable, with a p-value of more than 0.05 which was statistically insignificant. In our study we found that mode of delivery (NVD/Ventouse/LSCS) in both the groups were comparable, with a p-value of more than 0.05 which was statistically insignificant. Majority of patients had NVD. Zhang, J et al (1999) also revealed that epidural analgesia did not significantly raise the risk of instrumental vaginal delivery or the overall risk of caesarean delivery[9]. In our study we found that first attempt success rate was high with Group CLSP when compared with Group TSP, and this difference was statistically significant (p-value 0.012) showing that Group CLSP gives better results, which is in accordance with Puthenveettil et al (2020) [10] and Ružman, Tomislav et al (2014) [11] .When compared to Group TSP, we discovered that Group CLSP performed better because the crossed-leg sitting position produces knee and hip flexion, which increases the degree of lumbar flexion. By bringing the medulla spinalis closer to the midline and into a more superficial position, ideal lumbar flexion makes it possible to access the interspinous gap. In between these two groups ease of landmark palpation in CLSP group was statistically significant (p-value 0.037) when compared with TSP group, showing that Group CLSP gives better results. Sprung, J et al (1999), stated that examining the patient's back for landmarks and visible anatomical deformities helps determine whether a neuraxial block will be simple or difficult[12]. Similar results were demonstrated by Faitot, V et al (2011)[13]. In between these two groups needle bone contact with CLSP group was statistically significant (p-value 0.037) when compared with TSP group, showing that Group CLSP gives better results which

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is in accordance with Soltani Mohammadi, Sussan et al (2014)[14]. Patient comfort is better in CLSP group which is statistically significant than Group TSP which is in accordance with Shahzad, Khurrum et al (2013) [15]. To summarize, we found significantly improved outcome with crossed leg sitting position when compared with traditional sitting position in many aspects like successful 1st attempt, ease of landmark palpation, needle bone contact and patient comfort.

LIMITATIONS OF THE STUDY

The present study's limitations include non-blinding and a single-centric design.

5. CONCLUSION:

Epidural analgesia is very effective in relieving the pain and the discomfort that patient experiences during the process of active labour. Successful first attempts, lower number of needle bone contacts leads to lower number of post procedure complications and directly improve the quality of labour analgesia. Ease of landmark identification is of major importance as this is a blind procedure, and most importantly the patient being comfortable during the positioning as uncomfortable position can lead to multiple failed attempts, and Group CLSP showed statistically significant results in all these parameters.

Thus, we conclude that crossed-leg sitting position is better than traditional sitting position in providing Epidural labour analgesia for high BMI patients.

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