

## Straight versus Flexed Back: Does it Matter in Spinal Anaesthesia

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### Abstract

### Original Research Article

**Introduction:** The subarachnoid block is performed in sitting or lateral position with the flexion of patients back. Flexed back for spinal anaesthesia is considered facilitatory as it helps in widening the interspinous space. **Aims & objectives:** The aim of our study was to find out the degree of procedural success and patient preference when subarachnoid block was performed in suboptimal flexion of the back. **Methods:** 120 parturients between 22-40 yrs of ASA grade 1 & 2 undergoing LSCS were randomized into 4 groups of 30 each. **Observations and results:** Overall success rates of subarachnoid needle placement were 100% in all the groups. No patient in any of the groups required needle redirection because of lack or inadequate flow of CSF. All redirections were because of repeated bony contacts. Redirections required at 1<sup>st</sup> attempt were noted in 9, 13, 21 and 11 patients among the LS, LF, SS & SF groups respectively. The rest of patients needed them at 2<sup>nd</sup> attempt. **Conclusion:** Lumbar puncture can be performed with equal ease in sitting patient regardless of the posture of back being in a flexed or a straight posture provided that the landmarks are clear

**Keywords:** Subarachnoid block, parturient, sitting, lateral, interspinous space.

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## INTRODUCTION

The subarachnoid block is performed in sitting or lateral position with the flexion of patients back. Flexed back for spinal anaesthesia is considered facilitatory as it helps in widening the interspinous space [1, 2]. However, it may be uncomfortable for some patients to assume a flexed posture [5-7]. Straight back is a suboptimal posture to perform spinal block and there is only one study that compares successful lumbar punctures associated with this posture. This study was conducted on full term parturient who generally feels uncomfortable when put in the optimum position of spinal flexion for SAB. It was prospective and randomized study conducted on healthy parturient of ASA Grade 1&2. Difficulty may be faced in performing subarachnoid block in patients who feel discomfort in flexing the back for required procedure.

## AIM & OBJECTIVES

The aim of our study was to find out the degree of procedural success and patient preference when subarachnoid block was performed in suboptimal flexion of the back.

## METHODS

120 parturients between 22-40 yrs of ASA grade 1 & 2 undergoing LSCS were randomized into 4 groups of 30 each: Group LS: Lateral with back straight (LS). Group LF: Lateral with flexed back (LF). Group SS: Sitting with back straight (SS). Group SF: Sitting with flexed back (SF). Written informed consent from the patients taken. SAB was performed with patient in the assigned position. Points observed were correct needle placement, Number of attempts, Needle redirections, Position preferred by the patient. Exclusion criteria: Patients with anatomical spinal deformity, BMI > 30 KG/ m<sup>2</sup>, Previous back surgery, Non palpable spinous process, Neurological disease, Coagulation disorder, Local infections, Unstable haemodynamic parameters, During pre-anaesthetic meet on the day of surgery, patients were explained about the proposed postures for the procedures according to randomization table. In the operation theatre monitors (ECG, Pulse oximetry and non-invasive BP) were attached. Each patient was given a preference to select a comfortable position both in lateral or sitting posture and it was noted. Patients of LF AND LS groups were placed in lateral position at the edge of the table with 1 pillow under head. In LF

posture, an anaesthesia assistant helped each patient to obtain and maintain the best possible flexed posture by holding the patients at the occipital region and knees. Block was performed in lateral position. In LS posture, patients were put in the straight posture with no flexion of the back for spinal block. Patients of SS and SF groups sat on the table with legs hanging from the edge of the table with support of stool under the feet. Height of the stool was adjusted so that a right angle maintained between the thigh and the back. Sitting straight (SS) back position. Attained without any voluntarily achieved flexion of the back. The patient placed both of her hands over her thighs with elbows flexed. Both arms remained at respective mid axillary plane thus avoiding a forward or backward tilt of scapula. Sitting posture induced normal flexion of the back if any accepted; however no active or assisted flexion of the back was performed. Under aseptic conditions we performed the blocks with 23 G, Quincke spinal needle in widest interspinous space palpable. Aspiration of free flow of CSF was considered as successful needle insertion. 1<sup>st</sup> attempt –was taken as successful needle placement in appropriate interspinous space and free flow of CSF was there. Failed 1<sup>st</sup>

attempt-when it was felt that needle placement was in correct position but there was no CSF or scanty CSF with poor flow is considered as failed first attempt. 2<sup>nd</sup> attempt following failure of first attempt the needle was removed completely and reassessment of midline performed and needle was reintroduced in same first preferred space. 3<sup>rd</sup> attempt -In case of failed 2<sup>nd</sup> attempt, 3<sup>rd</sup> and final attempt was considered in 2<sup>nd</sup> preferred space (either 1 space above or below the first preferred space) by senior. In case of failed 3<sup>rd</sup> attempt, spinal procedure was abandoned in favour of general anaesthesia.

## OBSERVATION AND RESULTS

Based on Overall success, Success without manipulation of needles, Number of attempts required, Number of patients requiring manipulation of needles. Power analysis based on high overall success rate of subarachnoid block with 23G Quincke spinal needle (97%) required 30 patients in each group to complete the study with alpha and beta error of 5-10% respectively. In all calculations  $P \leq 0.05$  was the level of significance

DEMOGRAPHIC TABLE

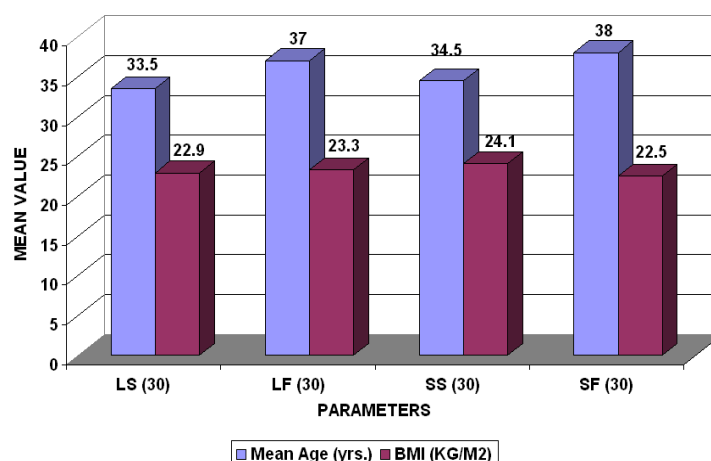


Table-1: Demographic data

Parameter s(n)	LS (30)	LF (30)	SS (30)	SF (30)	P Value
Age (years) [median (range)]	33.5 (23-40)	37 (22-38)	34.5 (22-40)	38 (22-39)	0.11* 0.35# 0.25^
BMI(kg/m <sup>2</sup> ) (mean+/- SD)	22.9+/- 2.7	23.3+/- 1.7	24.1+/- 3.1	22.5+/- 2.44	0.51* 0.65# 0.47^

Among the groups # LS vs LF, ^ SS vs SF

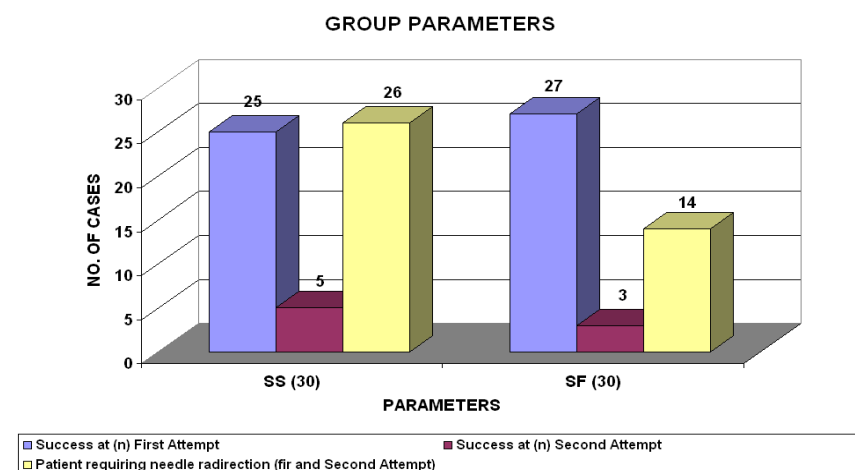
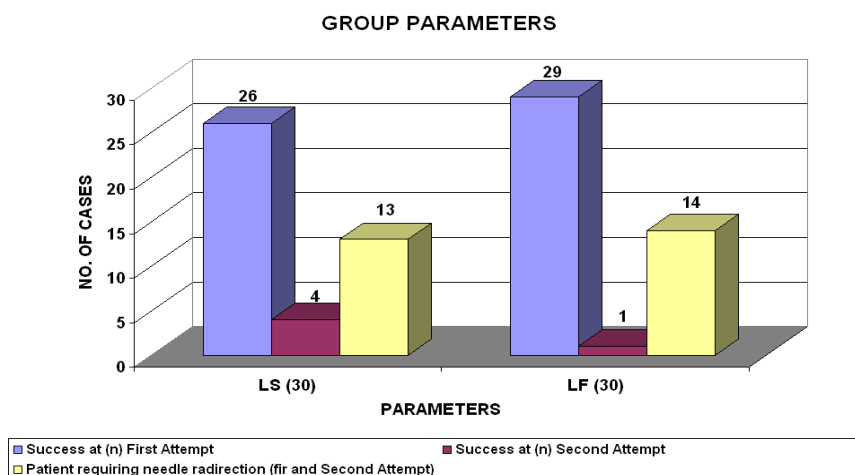
**Table-2: One way Anova Test is applied**

Group parameters (n)	LS (30)	LF (30)	SS (30)	SF (30)	P value (30)
Overall success (n)	30	30	30	30	It is perfect data cannot be analyze
Success at (n) First attempt Second attempt	26 4	29 1	25 5	27 3	0.20# 0.48^
Patients requiring needle redirections (first and second attempts)	13	14	26	14	0.80# <0.001^

Among the groups # LS vs LF, ^ SS vs SF

Fisher exact Test is applied. In SS patient required comparatively more needle redirection than

SF. Significant difference is found on applying Fisher Exact test with p value of <0.001



**RESULTS**

Overall success rates of subarachnoid needle placement were 100% in all the groups. No patient in any of the groups required needle redirection because of lack or inadequate flow of CSF. All redirections were

because of repeated bony contacts. Redirections required at 1<sup>st</sup> attempt were noted in 9, 13, 21 and 11 patients among the LS, LF, SS & SF groups respectively. The rest of patients needed them at 2<sup>nd</sup> attempt. Patient preference: Most of the patients (69.7-88%) preferred the straight posture especially of LS

group. In the LS group 12.5% of patients preferred the straight posture as they had felt pain over abdomen in flexed posture. 8% patients of LS group liked flexed posture as they feel more secure with assistance from attendants holding them. 12.5% patients in the SF group preferred straight posture because of discomfort over the neck in flexed posture. 2.5% Patients in LF group mentioned their discomfort both at knee joints and over abdomen in flexed posture.

## DISCUSSION

Literature regarding patient's preference for any particular posture for sub arachnoid block is usually flexed posture because it widens the interspinous space [3, 4]. Overall Success of spinal block in our study is 100%. First attempt success rates (83.3-96.6%) in our study are superior to success rate of 61.5% in the study conducted by De Oliveira *et al.* [7] We found that the overall success rate of subarachnoid block with flexed and straight spine of the 2 positions (sitting and lateral) were comparable. 1<sup>ST</sup> attempt success rate is lower in patients who had straight (LS) back than in those having flexed back (LF) but it is not significant. Although overall requirements of needle redirections were comparable, more patients of LS required midline re-assessment, resulting in a decreased success rate at 1<sup>st</sup> attempt and increase in number of 2<sup>nd</sup> attempts. Bony contacts could be negotiated easily by cephalad redirections. In lateral position, midline often does not correspond with underlying vertebral column because of longitudinal depression of skin which gets more pronounced if the back is not flexed and this could be the reason behind difficulties in identifying midline in 4 of our patients of LS group. Success rate at first attempt comparable between patients who had straight or flexed back in sitting position (SS & SF). In sitting straight, midline more accurately assessed which might be the reason for comparable success rate at 1<sup>st</sup> attempt between the groups more needle redirections with SS group than SF group. Significant difference is found on applying Fischer exact test with P value of <0.001

## CONCLUSION

Lumbar puncture can be performed with equal ease in seated patient regardless of the posture of back being in a flexed or a straight posture provided that the landmarks are clear. Most of the patients prefer straight back to the flexed back because of the discomfort associated with flexion. Our study does not challenge the superiority of classical posture but finds out the feasibility of spinal block with suboptimal posture.

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