

Efficacy of Dexmedetomidine to placebo for prevention of shivering during Spinal anaesthesia in abdominal hysterectomy: A Comparative Study

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Abstract:

Background: Shivering is common complication reported in patients undergoing surgery in spinal anaesthesia

Aim: To find out the efficacy of Dexmedetomidine to Saline for prevention of shivering during spinal anaesthesia in abdominal hysterectomy patients

Materials & Method: 60 patients of either sex between age group of 18 to 60 yrs, ASA grade I were enrolled for the study and were divided into two groups (Group D & Group S) of 30 each. Group D received Dexmedetomidine and Group S received Saline intravenously. The levels of sensory block were evaluated by loss of pinprick sensation 5 minutes after giving spinal anaesthesia by Hollmen Scale sensation at mid clavicular line. Motor block was assessed using a modified Bromage scale. Shivering scale was assessed by Tsai and Chu.

Results: It was observed that higher incidence of shivering in the Saline group (56.7%) when compared to Dexmedetomidine group (6.7%). The difference was found significant ($p \leq 0.05$) confirming that Dexmedetomidine is successful in controlling shivering.

Conclusion: Dexmedetomidine is better drug in prevention of shivering in spinal anaesthesia for abdominal surgeries

Keywords: Shivering, Dexmedetomidine, Infusion

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I. Introduction

Shivering is common complication during spinal anaesthesia which is a popular anaesthetic technique for lower abdominal surgeries. It is reported in 40 to 70% of patients undergoing surgery in spinal anaesthesia¹. Shivering in spinal anaesthesia is common occurrence because it impairs the thermoregulatory system by inhibiting tonic vasoconstriction and by redistribution of core heat from trunk to peripheral tissues. Not only shivering is an unpleasant, stressful feeling which sometimes worse than surgical pain²; but it also increases metabolic rate, oxygen demand & CO₂ production.

Dexmedetomidine is α_2 adreno receptor agonist. Activation of these receptors decreases sympathetic tone with attenuation of the neuroendocrine & hemodynamic response to anaesthesia and surgery. It also exerts dual effect by avoiding vasoconstriction and increasing the level of shivering threshold.

Hence this study was plan to evaluate the effect of dexmedetomidine on occurrence of shivering in patients of abdominal hysterectomy under spinal anaesthesia.

Aim: To find out the efficacy of Dexmedetomidine to Saline for prevention of shivering during spinal anaesthesia in abdominal hysterectomy

II. Materials & Method

The study was conducted at Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur after obtaining approval from the institutional ethical committee.

Sixty patients of either sex between age group of 18 to 60 yrs of ASA grade 1 with body weight between 50- 70 kg scheduled for abdominal hysterectomy were divided into two groups (Group D & Group S) of 30 each. Sample size ??

Patients of age more than 60 yrs, ASA grade of 4 or 5, patient with any respiratory, neurological or cardiac problems, had any history of drug reaction and contraindications to spinal anesthesia were excluded in the study.

Patients were divided randomly into one of two groups by seal enveloped method.

Group D - received Dexmedetomidine 1µg/ kg by a syringe pump over 10 minutes followed by an infusion of 0.4µg/kg/h during surgery.

Group S- received injection normal saline 1µg/kg by a syringe pump over 10 minutes followed by an infusion of 0.4µg/kg/hr during surgery.

Method

All the patients were assessed & examined a day before surgery. On the day of surgery baseline monitoring like temperature, P.R, B.P, SpO2 & shivering scale were noted. and All the patients were given Inj. Glycopyrolate (4µg/Kg), Inj. Midazolam (20µg/Kg) and Inj. ondansetron (80µg/Kg) after starting I.V. fluids (which are at normal temperature).

The operating room temperature was kept at 22⁰C ± 2⁰C. Anesthetic equipment & emergency drugs were kept ready. With all aseptic precaution, subarachnoid block were performed in L3-4 space in sitting position with 25 G spinal needle with 0.5% hyperbaric bupivacaine 15 mg at a rate of 0.2 ml/s.

The levels of sensory block were evaluated by loss of pinprick sensation 5 minutes after giving spinal anesthesia by Hollmen Scale sensation at mid clavicular line. Motor block was assessed using a modified Bromage scale and the Shivering scale was assessed by Tsai and Chu.

The onset of shivering is assessed by an observer both intra operatively as well as post operatively. Time taken for control of shivering and any adverse effect including haemodynamic changes or nausea, vomiting, others were noted.

III. Results and Discussion

Table 1:

Parameters	Group D	Group S	p Value	Significance
	(n=30)	(n=30)		
Shivering present	2	16	≤ 0.0001	H.S
Shivering absent	28	14	≤ 0.0001	H.S
Mean	1.7±0.6	2.7±0.7	0.0345	S

In the current study it was observed that there was higher incidence of shivering in the Saline group (56.7%) when compared to Dexmedetomidine group (6.7%). The difference was found significant (p≤ 0.05) confirming that Dexmedetomidine is successful in controlling shivering.(Table-1)

Table 2 Shivering Grade Comparison

Shivering grade	Group D(n=30)	Group S(n=30)	P value	significance
1	1	0		
2	1	8		
3	0	6		
4	0	2		
Mean	1.7±0.6	2.7±0.7	0.0345	S

Intensity of shivering in group D was of grade 1.7±0.6 while in group S it is 2.7±0.7. Shivering was more intense in Group S in which 8 patients were in grade 2, 6 patients were in grade 3 while 2 patients were in grade 4. .(Table-2)

However, onset time of shivering after Dexmedetomidine was 17.5 minutes (5-25 minutes) and 20 minutes (5-45 minutes) in saline group which was statistically not significant.

The heart rate and blood pressure were comparable at initial stage of induction then heart rate & blood pressure decreased in group D during surgery. Hemodynamic variations were manageable.

IV. Discussion

In the present study the shivering was more intense in group S(2.7±0.7)in which 8 patients were in grade 2,6 patients were in grade 3 while 2 patients were in grade 4 but it was less in Group D(1.7±0.6).(Table-2) However,the mean onset time of shivering after Demedetomidine was 17.5minutes(5-25 minutes) and 20 minutes (5-45 minutes) in saline group which was statistically not significant.

The results are comparable with the study of Mittal G³ and Katyal S¹ and Elvan et al⁴ who found that shivering is better controlled in Dexmedetomidine group than in Saline group.

Yong Sin Kim et al⁵ who studied optimal dose of Dexmedetomidine used this drug 10 minutes before extubation & found that it provides better protection from shivering in post operative period.

In the current study there were statistically difference for sedation between two groups, 26 patients in group D and one patient in group S were in level 3-5 of sedation score(p0.001). In the current study sedation score was higher in group D 2.96±0.56 to 1.9±0.40 than in group S. The results of the current study were comparable to Usta et al⁶ who found that sedation score was higher up to level of 3-5 in Dexmedetomidine group. Our results were also comparable to Bicer⁷ et al who compared Dexmedetomidine 1µg/kg as a single dose before end of surgery with placebo for prevention of shivering and found that 15% in group D and 55% in group C showed post operative shivering.

The heart rate and blood pressure were comparable at initial stage of induction then heart rate & blood pressure decreased in group D during surgery and nonsignificant. Hemodynamic variations were manageable.

V. Conclusion

In the current study we concluded that prophylactic administration of intravenous Dexmedetomidine is better ~~drug~~ in prevention of shivering in spinal anesthesia for abdominal surgeries. Incidence and intensity of shivering were found to be less in the Dexmedetomidine group when compared to the control group.

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