Original Article

Comparative Study between Dexmedetomidine and Nalbuphine for prevention of post spinal shivering in Obstetrics cases- A randomized controlled trial

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Abstract

Background: *Shivering is a physiological response to core hypothermia in an attempt to raise the metabolic heat production. The main causes of intra/post-operative shivering are temperature loss, increased sympathetic tone, pain, and systemic release of pyrogens. Spinal anaesthesia significantly impairs the thermoregulation system by inhibiting tonic vasoconstriction, which plays a significant role in temperature regulation. It also causes a redistribution of core heat from the trunk (below the block level) to the peripheral tissues. These factors predispose patients to hypothermia and shivering. Several pharmacological agents are used for control of Post spinal shivering. Nalbuphine has become a favoured and commonly used drug for post-spinal shivering. However, it has many adverse effects like nausea, vomiting, dizziness etc. Dexmedetomidine is another agent which has gained popularity during the last few years. Dexmedetomidine is an a2-adrenergic receptor agonist, has been used as a sedative agent and is documented to increase the shivering threshold.*

Objectives: *To assess the superiority of Dexmedetomidine over Nalbuphine in prevention of post spinal shivering.*

Materials & method: *This prospective, randomized clinical trial was conducted in Department of Anaesthesia, Analgesia, Palliative and Intensive Care Medicine, Dhaka Medical College Hospital, from 18th October 2019 to 17th April 2020. Total 120 patients were selected and allocated into two groups, group N (Nalbuphine) and group D (Dexmedetomidine). Patients of Group N was given intravenous Nalbuphine 0.07 mg/kg mixed with 0.9% normal saline to a volume of 10ml. Patients of Group D was given intravenous Dexmedetomidine hydrochloride 1 μg/kg mixed with 0.9% normal saline to a volume of 10ml. Then shivering grade and haemodynamic status were recorded at different follow-up time and compared between groups.*

Result: *Majority of the patients i.e. 58.33% (n=70) were between 25-30 years, mean age was found to 26.7±8.4 years and 26.7±8.4 years in Group D & N respectively. The heart rate after 5 min (56, 62 beat/min respectively), after 10 min (58, 68 beat/min respectively) and 15 min (63, 72 beat/min respectively) after of anaesthesia were statistically significant. Shivering grade 3 or 4 was existed in both groups, but more in group N. Rescue medication for shivering (Inj. Pethedine 25 mg) requirement was higher in Group-N & difference was statistically significant. Shivering was controlled within 15 minute in maximum 13(21.66%) of patients in group D. Comparison of sedation, 45 minute after mean sedation score was found 2.03±0.07 in group D, but in group N score is reduced and found 1.43±0.127. Mean sedation score difference was statistically significant (p<0.05) between two groups.*

Conclusion: *Post spinal shivering is very distressing for patients and may induce a variety of complications. Present study concluded that Dexmedetomidine was more effective compared to Nalbuphinein attenuating the post spinal shivering.*

Key words: Post spinal shivering, Dexmedetomidine, Nalbuphine.

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Introduction:

Spinal anaesthesia is the preferred anaesthetic choice for the majority of the caesarean section operation, especially for elective cases. It has become the gold standard technique for its fast, profound and symmetrical sensory and motor block of high quality in parturient undergoing caesarean delivery. Beyond many advantages of this anaesthetic management for obstetric patient- spinal anaesthesia is often a cause of embarrassing situation for an anaesthetist resulting from the adverse effect of the technique. The most common adverse effect of spinal anaesthesia for caesarean delivery is the post spinal shivering. Shivering, a common post-anaesthesia occurrence is defined as an involuntary, repetitive activity of skeletal muscles. Post spinal shivering is very distressing for patients and may induce a variety of complications[1]. The combination of anaesthetic induced thermoregulatory impairment and exposure to a cool environment makes most unwarmed surgical patients hypothermic. Inadvertent hypothermia is associated with numerous adverse outcomes in the postoperative period. Shivering is an important complication of hypothermia[2]. Previous study noted shivering is frequent during the post-anesthetic recovery period also[3].

Human body core temperature ranges between 36.5ºC and 37.5ºC. Body temperature is regulated by the anterior hypothalamus when the peripheral temperature reaches a certain threshold. This regulation is mainly achieved by reflex activity when the temperature exceeds or falls below a certain level[4, 5]. It is well known that both general and regional anesthesia affects the homeostatic system. Body temperature falls by 0.5ºC with regional anesthesia, leading to vasoconstriction and resulting shivering above the level of the blockade[6]. Shivering occurs in 40–60% of all regional anesthetized patients[7]. Shivering increases the metabolic heat production up to 600% above basal level[8]. Muscle tone increases during shivering, resultant increases metabolism[9]. Shivering also increased cardiac output, elevated peripheral vascular resistance, and increased CO_2 and lactic acid production[4]. Therefore proper evaluation and appropriate management is pivotal.

Post anesthetic shivering may cause discomfort to patients, and aggravate wound pain by stretching incisions and increase intracranial and intraocular pressure[3]. Post spinal shivering had a prevalence of 8.15 %, commonly occurred at 30 min postoperatively with hypotension plus hypothermia as main associated factors[10]. Several pharmacologic and nonpharmacologic strategies are available for the treatment of shivering. The non-pharmacological management is by external heating like the use of forced air warming, warming blankets, warmed fluids etc. The pharmacological agents for combating it are Pethidine, Tramadol, Nefopam, Ketamine, Dexmedetomidine, Granisetron, Physostigmine, Clonidine, Nalbuphine, Magnesium sulphate, etc.

During the last decade, Nalbuphine has become a favoured and commonly used drug for post-spinal anaesthesia shivering. However, it has many adverse effects like nausea, vomiting, dizziness etc., which cause further discomfort to the patient. Dexmedetomidine is another agent which has gained popularity during the last few years. Dexmedetomidine is an α_2-adrenergic receptor agonist, has been used as a sedative agent and is documented to increase the shivering threshold. There are few studies

evaluating the use of prophylactic Dexmedetomidine and Nalbuphine for prevention of shivering during spinal anaesthesia, while there are no studies that directly compare the two drugs. Therefore aim of the present study was to see the effectiveness of Nalbuphine versus Dexmedetomidine for prevention of post-spinal shivering in obstetrics cases.

Methodology:

This prospective, double-blinded, randomized trial was conducted in department of Anaesthesia, Analgesia, Palliative & Intensive Care Medicine in collaboration with Department of Obstetrics and Gynecology, Dhaka Medical College Hospital. According to inclusion and exclusion criteria the study subjects involved total 120 consecutive patients scheduled for LUCS under spinal anaesthesia. The ethical approval was obtained from Dhaka Medical College and written informed consent was taken from all the patients. The selected patients were randomly allocated using computer generated method and opaque sealed envelopes into 2 groups containing 60 patients each according to the study drug; Group N was given intravenous (iv) bolus of 0.07 mg/kg Nalbuphine and Group D was given an intravenous (iv) bolus of 1 µg/kg Dexmedetomidine hydrochloride prophylactically. All study drugs diluted with 0.9% saline to a 10 ml volume and administered over five minutes just after sub-arachnoid block (SAB). Preoperatively, demographic characteristics as age, sex, height, and weight were recorded.

In the operation theatre (OT), routine standard monitoring was used in all patients in the form of non-invasive blood pressure (NIBP), pulse oximetry and ECG. Before SAB block, each patients were preloaded with 10-15ml/kg of Ringer Lactate solution. With the patient in the sitting position, the lumbar regionprepped with antiseptic precaution. After skin infiltration of local anaesthetic (2% Lidocaine) a 25 gauge Quincke's needle was introduced at L3-4 interspace. After free flow of cerebrospinal fluid confirmed, 2.5 ml of 0.5% bupivacaine heavy(12.5 mg) was injected intrathecally. All operating theatres in which the operations performed maintained an ambient temperature of around 24°C. After completion of SAB blocks, the patient lied supine and oxygen administered via a nasal cannula (2 L/min) till the end of the procedure. Temperature was monitored routinely after the SAB block. The intravenous fluids kept at room temperature 24°C and all the patients were covered with a standard single blanket. Just after the SAB, one of the study drugs was given slowly by IV route over five minutes. The study drugs prepared, diluted to a volume of 10 ml and presented as coded syringes by an anesthesiologist who not involved in the management of the patients or data acquisition. During and shortly after completion of the surgical procedures, the data of non-invasive blood pressure, heart rate, oxygen saturation, shell body temperature, duration of surgical procedures and the level of SAB was recorded.

The primary outcome was incidence of shivering in the early 45 min after SAB blocks as defined by a shivering score≥3 at any time of the predefined assessment points (highest score). Shivering score, incidence of hypotension, incidence of bradycardia and incidence of complications were secondary outcomes. The shivering score was assessed at 5min interval for 45 min after SAB and graded using a scale like that validated by Tsai and Chu[11], (Grade 0: no shivering, Grade 1: piloerection or peripheral vasoconstriction but no visible shivering, Grade 2: muscular activity in only one muscle group, Grade 3: muscular activity in more than one muscle group but not generalized and Grade 4: shivering involving the whole body). The attending anesthetsiologist recorded the time in minutes at which shivering started after spinal anaesthesia (onset of shivering), severity of the shivering (grade). Continuous shivering ≥ grade 3 for 15min was considered significant side effect of SAB despite prophylactic IV administration of study drugs and a rescue dose of 0.35 mg / kg of pethidine was administered to control this

unpleasant prolonged shivering. Sedation score was assessed with a four-point scale: 1: Awake and alert. 2: Somnolent, but responsive to verbal stimuli. 3: Somnolent, arousable to physical stimuli. 4: Unarousable. Hypotension (systolic blood pressure < 90 mmHg) will be controlled by IV ephedrine administration 5mg increments and by IV fluid boluses to keep systolic blood pressure≥90mmHg upon the discretion of the attending anesthesiologists. Bradycardia (heart rate<60 beats/ minute) was treated by IV atropine sulphate 10µg/kg upon the judgment and preferences of the attending anesthesiologist. Nausea and vomiting incidences recorded and managed according to the attending anesthesiologist discretion. Fetal outcome was assess by APGAR score at 1st minute and 5th minute after delivery. All the information recorded in data collection sheet. All collected questionnaires checked very carefully to identify the error in the data. Data processing work was consisted of registration schedules, editing computerization, preparation of dummy table, analyzing and matching of data. Data was processed and analysed with the help of computer program SPSS (Statistical Package for Social Science) and Microsoft excel. Quantitative data expressed as mean and standard deviation and qualitative data as frequency and percentage. Comparison was done by tabulation and graphical presentation in the form of tables, pie chart, graphs, bar diagrams, histogram & charts etc.

Result & Observation:

Total of 120 patients fulfilling inclusion & exclusion criteria were studied. Results and observations are given below:

Table I shows the demographic profile of the patients. Mean age was found to 26.7±8.4 years and 26.7±8.4 years in Group D & N respectively. The difference was statistically insignificant (p ≥ 0.05). ASA-II status was found in 12 patients in Group-N & 11 patients in Group-D, difference was statistically insignificant (P= 0.864). Parity distribution revealed that 23 patients in Group-D & 26 patients in Group-N were primigravid. The difference was not statistically significant (p>0.05) between two groups.

Table II shows the systolic blood pressure (SBP) between groups with respect to time. At preanaesthesia, mean systolic BP was found 115.6±6.3 mmHg in group N and 114.3±5.0 mmHg in group D. the difference was insignificant. After 5 min it was 92.5±6.8 mmHg and 81.4±9.2 mmHg in group N and group D respectively. After 10 min, 95.3±7.1 mmHg in group N and 85.5±5.1 mmHg in group D. After 15 min, 95.6±11.2 mmHg and 84.3±4.8 mmHg in group N and group D respectively. After 20 min, it was 97.9±4.7 mmHg in group N and 82.3.3±5.0 mmHg in group D. After 45 minute, mean SBP was 84.6±11.6 mmHg and 72.3±8.2 mmHg in group N and group D respectively and after 60 minutes, it was 79.6±6.0 mmHg in group N and 69.2±9.4 mmHg in group D. From 5th minute to 45th minute the difference was statistically significant (p<0.05) between two groups, but at 60th minute difference was statistically non significant.

Table III shows diastolic blood pressure during follow up. After 15 minute, mean diastolic blood pressure was found 67.6±7.4 mmHg in group D and 61.5±9.7 mmHg in group N. After 45 minute, mean diastolic blood pressure was 65.0±6.8 mmHg in group N and 60.5±9.4 mmHg in group D, which statistically significant (p<0.05) between two groups but other follow up were not significant (p>0.05)..

Table IV shows mean blood pressure. There was no significant difference between the groups as regards preanaesthesia MAP (p=1.025), after anaesthesia significant decrease in MAP was seen in all groups compared with basal MAP, the least decrease occurring in the group N and the highest fall in the group D. At the 15th minute MAP was 76.92, 69.18 mm of Hg in group N and group D respectively showing significant difference (p=0.0001), After 45 minute, mean blood pressure was 71.05±6.8 mmHg in group N and 64.46±9.4 mmHg in group D which is statistically significant (p<0.05) between two

groups but follow up after 60 minute mean BP stabilized to similar in both group, which was statistically not significant (p>0.05) between two groups.From5thminute to 45th minute the difference was statistically significant (p<0.05) between two groups.

Table V shows shivering grade in between groups. No shivering (grades-0) was occurred in more patients (n=35) in group-D but difference was statistically insignificant. There was no statistically significant difference between two groups regarding incidence of grade 1 & 2 shivering. Grade 3 and 4 shivering was occurred in more number of patients (n=20) in group N than group D (n=15). Mean shivering grade was higher in group N (1.3±0.5) compared with group D (1.0±0.1). The difference was statistically significant (p<0.0001). So Dexmedetomidine is better for attenuation of shivering.

Table VI shows the requirement of rescue medication for shivering. Rescue medication for shivering (Inj. Pethedine 25 mg) was required in more number of patients (n=20) in Group-N. Rescue drug was given after development of shivering in both groups. Shivering was controlled within 15 minute in 13(21.66%) of patients in group D and 7(11.6%) patients of group N. Success rate was significant in between group (p=0.0041).

Table VII shows the occurrence of complication & requirement of medication to control the adverse event. The differences were statistically significant (p<0.05) between two groups. Rescue drugs for nausea and vomiting was required for more number of patients in group N & difference was statistically significant. Rescue from hypotension inj. Ephedrine was needed for more number of patients group D and difference was statistically significant. Regarding rescue from bradycardia usage of Inj. Atropine was required for more number of patients in group D & difference was statistically significant.

Table VIII shows sedation between groups. After 45 minute, mean sedation was found 2.03±0.07 score in group D, but in group N score is reduced and found 1.43±0.127. Mean difference was statistically significant (p<0.05) between two groups. So it is proven that after taking of tested medication (Dexmedetomidine) anxiety and agitation remarkably reduce and desired level of sedation established. After 90 minute, mean sedation was found 3.11±0.12 score in group D and 2.35±0.11 score in group N. The quality of pleasant and adequate sedation varied between groups, and it was maintained properly in group D in whole time. But after 2hrs sedation level gradually impaired in both groups. After 180 minute, mean sedation score between groups almost similar and was found 3.51±0.21 score in group D and 3.26±0.191 score in group N.So precise control of the depth of sedation was maintained in group D than group-N.

Table IX shows APGAR scoring. Neonatal outcome were similar in both groups. The table shows APGAR score 7 at first minute was in maximum neonates, in group D (n=39) and in group N (n=42). At 5th minute, most of the baby (n=48) in group D and (n=40) group NAPGAR score was >8. The difference was statistically non-significant (p>0.05).

Table I: Demographic characteristics of the patients (n=120)

Variables	Group D (n=60)	Group N (n=60)	P-value
Age (Mean ± S.D)	26.7±8.4	26.1±8.2	0.692
ASA status			
ASA I	49	48	0.913
ASA II	11	12	0.864
Parity			
Multigravida	37	34	0.732
Primigravida	23	26	0.703

Table II: Evaluation of systolic blood pressure (SBP) between groups with respect to time (n=120)

SBP (Time point)	Group D (Mean±SD)	Group N (Mean±SD)	P value
Preanaesthesia	114.3±5.0	115.6±6.3	0.825
5th min	81.4±9.2	92.5±6.8	0.001
10th min	85.5±5.1	95.3±7.1	0.001
15th min	84.3±4.8	95.6±11.2	0.001
20th min	82.3±5.0	97.9±4.7	0.001
30th min	84.8±5.0	94.6±15.6	0.002
45th min	72.3±8.2	84.6±11.6	0.001
60th min	69.2±9.4	79.6±6.0	0.467

Table III: Evaluation of diastolic blood pressure (DBP) between groups with respect to time (n=120)

DBP (Time point)	Group D (Mean±SD)	Group N (Mean±SD)	P value
Preanaesthesia	89.6±6.0	85.2±9.4	0.508
5th min	63.9±5.2	61.2±9.6	0.213
10th min	65.4±5.6	62.5±9.5	0.186
15th min	67.6±7.4	61.5±9.7	0.013
20th min	65.5±7.1	61.9±9.7	0.096
30thmin	66.0±6.8	61.2±9.4	0.039
45th min	60.5±9.5	65.2±5.6	0.001
60th min	59.5±5.0	60.2±7.4	0.432

Table IV: Evaluation of Mean arterial blood pressure between groups with respect to time (n=120)

MAP (Time point)	Group D (Mean±SD)	Group N (Mean±SD)	P value
Preanaesthesia	93.54±9.1	93.60±11.6	1.025
5th min	67.90±9.5	73.45±8.2	0.0001
10th min	70.25±10.2	75.40±7.9	0.0001
15th min	69.18±9.5	76.92±8.1	0.0001
20th min	68.73±9.1	76.31±8.6	0.0001
30thmin	69.18±7.5	75.57±10.2	0.0001
45th min	64.46±11.4	71.05±9.3	0.035
60th min	60.52±7.1	59.55±6.8	0.486

Table V: Evaluation of shivering grade in between groups (n=120)

Grade	Group D n(%)	Group N n(%)	P-value
0	35 (58.3%)	30 (50.0%)	0.363
1	6 (10.0%)	5 (8.3%)	0.747
2	4 (6.6%)	5 (8.3%)	0.724
3	10 (16.7%)	12 (20.0%)	0.641
4	5 (8.3%)	8 (13.3%)	0.379
mean±SD	1.0±0.1	1.3±0.5	<0.0001

Table VI: Distribution of cases according to attenuation of shivering (n=60)

Rescue Medications	Group D (n=60)	Group N (n=60)	P-value
No of patients required rescue drug to control shivering	15	20	0.319
No of patients controlled shivering after getting rescue drug	13	7	0.013
Success rate	86.7	35.0	0.0041

Table VII: Distribution of cases according to complication & requirement of medication to control the adverse event (n=120)

Variables	Group D (n=60)	Group N (n=60)	P-value
Complications			
Nausea	04 (06.67%)	20 (33.33%)	0.001
Vomiting	08 (13.33%)	28 (46.67%)	0.001
Bradycardia	13 (21.6%)	4(6.66%)	0.001
Rescue Medications			
Ephedrine 5 mg	24 (40.00%)	04 (06.67%)	0.001
Prochlorperazine 12.5 mg	09 (15.00%)	29 (48.33%)	0.001
Atropine 0.6 mg	13 (21.6%)	4(6.66%)	0.001

Table VIII: Assessment of sedation between groups (n=120)

Sedation Scale	Group D n(%)	Group N n(%)	P value
After 45 minute			
1	27 45.0	45 75.0	
2	13 21.6	7 11.6	
3	11 18.3	5 8.3	
4	9 15.0	3 5.0	
Mean±SD	2.03±0.07	1.43±0.12	0.001
After 90 minute			
1	12 20.0	22 36.7	
2	10 16.7	9 15.0	
3	16 26.7	15 25.0	
4	22 36.7	14 23.3	
Mean±SD	3.11±0.12	2.35±0.11	0.001
After 180 minute			
1	0 0	0 0	
2	7 11.6	19 31.6	
3	18 30.0	13 21.6	
4	35 58.3	28 46.7	
Mean±SD	3.51±0.21	3.26±0.19	0.131

Table IX: APGAR scoring of neonates (n=120)

	Group D (n=60)				Group N (n=60)				p-value
APGAR Score (Out of 10)	**<7**	**7**	**8**	**>8**	**<7**	**7**	**8**	**>8**	
1st minute	0	39	19	2	0	42	17	1	0.275
5th minute	0	5	7	48	0	6	14	40	0.843

Discussion:

In our study the two groups were comparable in terms of age, ASA and haemodynamic stability during surgery. While studying the distribution of cases by age it was found that mean age was found to 26.7±8.4 years and 26.7±8.4 years in Group D & N respectively. The difference was statistically insignificant ($p \geq 0.05$). Most of the patients (80.33 %; n=97) were in ASA I status. On evaluation of shivering grade, shivering was controlled within 15 minutes in maximum 13(21.66%) of patients in group D. Shivering grade 3 or 4 was existence mainly in patients of group N and more rescue drugs also had required in this group. Thus in this study suggest that regime of group D is superior to regime of group N in controlling the shivering immediately.

Similar observation was noted in other study. All the groups were comparable with regard to time of onset and grading of shivering. Mean time to cessation of shivering after injection of drug was 1.97 ± 0.61 min in group D while it was 3.56 ± 0.82 min in group N and 12.4 ± 3.74 min in group C which was statistically significant (p value < 0.0001) on intergroup comparison. Shivering was controlled in 100% of patients in Dexmedetomidine group compared to 92% of patients in Nalbuphine group and 32% in normal saline group. A statistically significant difference (p value < 0.0001) in success rate[12].

In this study rescue medication for shivering (Inj. Pethedine 25 mg) required almost equally for both study group but regarding rescue from hypotension usage of drugs were significantly more in group N. Megalla et al showed the superiority of dexmedetomidine over nalbuphine in treatment of postspinal shivering as shown by a shorter response time, higher success rate and less recurrence[12]. In their study, a dose of 0.07 mg/kg nalbuphine was used. This dose was chosen on the basis that equianalgesic doses of nalbuphine versus meperidine is 1:5[13] and, Wrench et al. suggested that the minimal effective dose of meperidine for treating postspinal shivering is approximately 0.35 mg/kg[14]. This dose effectively controlled shivering in 92% of patients with only an 8.7% recurrence rate[12].

Kyokong et al. used 0.05 mg/kg to treat shivering following spinal anesthesia for cesarean section. Nalbuphine showed a success rate of 81.4% and a 15.8% recurrence rate[15]. This difference may be attributed to the smaller dose used and the much younger mean age of their study group 29.93 ± 5.3 vs 52.06 ± 13.36 yrs in our groups. Gotz et al., used 10 mg nalbuphine to treat shivering following general anesthesia and found that nalbuphine suppressed postoperative shivering as effectively and timely as meperidine[16]. Wang et al., used a dose of 0.08 mg/kg to treat shivering following general anesthesia, nalbuphine produced a rapid and potent antishivering effect similar to that observed with meperidine[17].

In the present study, Dexmedetomidine produced a rapid and effective control of shivering and sedation in maximum patients. Similar observation reported by Megalla et al that Dexmedetomidine 0.5 lg/kg produced a rapid and effective control of shivering in 100% of patients with no recurrence[12]. This dose was chosen according to the results of a meta-analysis which indicated the minimum effective dose for controlling postoperative shivering to be 0.5 lg/kg[18].

Mittal et al. used dexmedetomidine 0.5 mg/kg for treatment of post spinal shivering. Dexmedetomidine controlled shivering in100% of patients and time for cessation of shivering was 2.52 ± 0.44 min, recurrence occurred in 4% of patients. The incidence of sedation was 21.4%[19]. Blaine Easley et al. reported that dexmedetomidine 0.5 lg/kg as a single IV bolus dose over 3–5 min was effective for treatment of postanesthesia shivering. There was no recurrence of shivering and no adverse effects[20].

In this study after 45 minute, mean sedation was found 2.03±0.07 score in group D, but in group N score is reduced and found 1.43±0.127. Mean difference was statistically significant ($p<0.05$) between two groups. So it is proven that after taking of tested medication (Dexmedetomidine)

anxiety and agitation remarkably reduce and desired level of sedation established.

Megalla et al reported sedation accompanied both nalbuphine (64%) and dexmedetomidine (80%) which is actually beneficial during surgery under spinal anesthesia. So, it is concluded that both Nalbuphine and Dexmedetomidine control shivering effectively, but Dexmedetomidine seems to be a better choice than Nalbuphine for treatment of postspinal shivering due to its shorter response time, lower recurrence rate and associated sedation[12].

Conclusions:

Management of shivering, hypotension, bradycardia following spinal anaesthesia in obstetrics continues to be controversial. Different strategies like pre-loading, co-loading, positioning, uterine displacement and prophylactic use of ephedrine are being practiced widely but none is proved sufficient. Rather some of these have unwanted effects both for mothers and babies. In the current study the efficacy of Dexmedetomidine and Nalbuphine in attenuation of post-spinal shivering and haemodynamic derangements following spinal anaesthesia has been proved satisfactory with a statistically significant supremacy of the former over the later. Beside this, Dexmedetomidine bears additional advantages in the management of pleasant sedation and other adverse effects. Dexmedetomidine also offers a significant advantage over Nalbuphine as regards to the duration and quality of analgesia. So that Dexmedetomidine may be used for control of post spinal shivering of elective caesarean section operations.

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