ORIGINAL RESEARCH

INTRATHECAL DEXMEDETOMIDINE OR MEPERIDINE FOR POST-SPINAL SHIVERING

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ABSTRACT

Background: Spinal anesthesia has been widely used to provide anesthesia and analgesia for cesarean section, which allows a patient to remain awake for the birth of her baby while avoiding the risks of general anesthesia. Hence; the present study was conducted for assessing the efficacy of Intrathecal Dexmedetomidine or Meperidine for Post-spinal Shivering.

Materials and methods: 40 Healthy subjects scheduled for caesarean delivery under CSEA were eligible for the present study and were broadly divided into two study groups as follows: Dexmedetomidine group (Group 1, n=20) and meperidine group (Group 2, n=20). Complete demographic and clinical details of all the subjects were obtained. C section was performed at L3-4 or L2-3 interspace. If primiparas shivered before cord clamping, dexmedetomidine 0.5 µg/kg or meperidine 0.5 mg/kg was administered intravenously. If shivering lasted more than 15 min, the treatment was considered invalid. If treatments were not effective, 4 mg ondansetron could be administered intravenously as a rescue medicine

Results: Incidence of shivering was similar among both the study groups. However; incidence of nausea and vomiting was significantly higher among subjects of group 2.

Conclusion: Both Dexmedetomidine and Meperidine had similar effect on Post-spinal Shivering.

Key words: Shivering, Dexmedetomidine, Meperidine.

INTRODUCTION

Spinal anesthesia has been widely used to provide anesthesia and analgesia for cesarean section, which allows a patient to remain awake for the birth of her baby while avoiding the risks of general anesthesia. Even though the risk of spinal anesthesia is lower than that of general anesthesia, the adverse events caused by spinal anesthesia, such as shivering, are still present during surgical procedures, causing discomfort for the patients.[1-3]

The incidence of shivering is up to 55% according to a previously published study. Shivering may lead to increased oxygen consumption and negative effects on pulse, oxygen saturation, and blood pressure. Severe adverse effects may occur if the patient has cardiopulmonary

insufficiency. Dexmedetomidine (DEX), as a highly selective α-2 adrenoreceptor agonist, can provide some beneficial effects when administered through the spinal route, such as sedation, analgesia, antianxiety effects, and increased threshold of shivering.[4,5]

Dexmedetomidine can be administered intravenously or intrathecally during spinal anesthesia, but there is some controversy about which method should be used during anesthesia for pregnant women. The use of dexmedetomidine by the intravenous route has been reported to result in hemodynamic instability.[6, 7] hence; the present study was conducted for assessing the efficacy of Intrathecal Dexmedetomidine or Meperidine for Post-spinal Shivering.

MATERIAL AND METHODS

The present study was conducted with the aim of assessing the efficacy of Intrathecal Dexmedetomidine or Meperidine for Post-spinal Shivering. 40 Healthy subjects scheduled for caesarean delivery under CSEA were eligible for the present study and were broadly divided into two study groups as follows: Dexmedetomidine group (Group 1, n=20) and meperidine group (Group 2, n=20). Complete demographic and clinical details of all the subjects were obtained. C section was performed at L3-4 or L2-3 interspace. If primiparas shivered before cord clamping, dexmedetomidine 0.5 μg/kg or meperidine 0.5 mg/kg was administered intravenously. If shivering lasted more than 15 min, the treatment was considered invalid. If treatments were not effective, 4 mg ondansetron could be administered intravenously as a rescue medicine. All the results were recorded and analysed by using SPSS software.

RESULTS

Mean age of the patients of group 1 and group 2 was 39.3 years and 41.5 years respectively. Mean gestational age among subjects of group 1 and group 2 was 38.2 weeks and 38.6 weeks respectively. Mean BMI among subjects of group 1 and group 2 was 28.6 Kg/m^2 and 29.7 Kg/m^2 respectively. Mean duration of surgery among subjects of group 1 and group 2 was 63.6 minutes and 66.1 minutes respectively. Amount of blood loss among subjects of group 1 and group 2 was 253.3 ml and 267.2 ml respectively. Incidence of shivering was similar among both the study groups. However; incidence of nausea and vomiting was significantly higher among subjects of group 2.

Table 1: Demographic and clinical variables

Variable	Group 1	Group 2
Mean age (years)	39.3	41.5
BMI (Kg/m^2)	28.6	29.7
Duration of surgery (minutes)	63.6	66.1
Mean gestational age (weeks)	38.2	38.6
Amount of bleeding (ml)	253.3	267.2

Table 2: Incidence of shivering, nausea and vomiting

Variable	Group 1		Group 2		p- value
Shivering	1	5	2	10	0.24
Nausea	1	5	6	30	0.000*
Vomiting	2	10	7	35	0.001*

*: Significant

DISCUSSION

For short procedures such as uroscopic surgeries, spinal anaesthesia (SA) is a very reliable and convenient technique, especially for procedures in which patient consciousness must be maintained to detect intraoperative complications, such as transurethral resection of the prostate (TURP) syndrome. However, hypothermia and shivering are common complications after SA, especially when large amounts of cold intraluminal irrigating fluids are used. SA impairs thermoregulation, inhibits tonic vasoconstriction, and causes the redistribution of core heat from the trunk to the peripheral tissue. Shivering interferes with proper monitoring and is associated with several adverse effects, as it increases the circulating catecholamine, heart rate, cardiac output, minute ventilation, patient oxygen consumption, metabolic CO2 production, lactic acid level, intraocular and intracranial pressure, and postoperative pain from surgical incision stretching. Various opioid and non-opioid agents, such as meperidine, ketamine, tramadol, and clonidine, have been used to prevent shivering, but they have many side effects, and their results have not been conclusive.[7-9] Hence; the present study was conducted for assessing the efficacy of Intrathecal Dexmedetomidine or Meperidine for Post-spinal Shivering.

In the present study, mean age of the patients of group 1 and group 2 was 39.3 years and 41.5 years respectively. Mean duration of surgery among subjects of group 1 and group 2 was 63.6 minutes and 66.1 minutes respectively. Amount of blood loss among subjects of group 1 and group 2 was 253.3 ml and 267.2 ml respectively. Incidence of shivering was similar among both the study groups. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a similar study conducted by Nasseri K et al, authors investigated the effects of intrathecal dexmedetomidine in the prevention of shivering in those who underwent CS under SA. Spinal block was achieved with 12.5 mg 0.5% heavy bupivacaine plus 5 μg dexmedetomidine (BD group) or 0.5 mL 0.9% normal saline (BN group). The incidence of shivering was significantly higher in the BN group (52%) than the BD group (24%) (P=0.04). Likewise, the intensity of shivering was significantly higher in the BN group than the BD group (P=0.04). They concluded that intrathecal dexmedetomidine is effective in lowering the incidence and intensity of shivering in parturients undergoing CSs under SA without major adverse effects.[10]

In the present study, incidence of nausea and vomiting was significantly higher among subjects of group 2. In a similar meta-analysis conducted by Miao S et al, authors searched PubMed, Embase, Web of Science, and the Cochrane Library for randomized controlled trials (RCTs) comparing intrathecal DEX in cesarean section after spinal anesthesia with placebo and reporting on shivering, postoperative nausea and vomiting (PONV), hypotension, and

bradycardia. Compared with placebo, intrathecal DEX significantly reduced the incidence of shivering. No significant difference was found in the incidence of PONV, hypotension, or bradycardia. However, no firm conclusions can be made based on the results of all outcomes according to the TSA. Their meta-analysis concluded that intrathecal DEX could prevent shivering in cesarean section after spinal anesthesia and did not induce PONV, hypotension, or bradycardia.[11] Omar H et al, in a similar study, compared the effects of intrathecal dexmedetomidine versus intrathecal magnesium sulfate on the prevention of post-spinal anaesthesia shivering. Intrathecal injections of both dexmedetomidine and magnesium sulfate were effective in reducing the incidence of post-spinal anaesthesia shivering.[12]

CONCLUSION

Both Dexmedetomidine and Meperidine had similar effect on Post-spinal Shivering.

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