



Anaesthesiology

EFFECT OF INTRATHECAL DEXMEDETOMIDINE AS AN ADJUVANT TO BUPIVACAINE 0.5% HEAVY FOR PREVENTION OF POST SPINAL SHIVERING IN CESAREAN SECTION

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ABSTRACT

Introduction: Dexmedetomidine is among several pharmacological agents used for the treatment of shivering. Dexmedetomidine is a highly selective α_2 -adrenoceptor agonist with potent effects on the central nervous system without respiratory depression and it also has several desirable properties like sedation, anxiolysis, sympatholysis and analgesia. **Objectives:** To evaluate the effect of intrathecal Dexmedetomidine on - reducing incidence of post spinal shivering, reducing intensity of shivering, haemodynamic parameters, occurrence of complications. **Material & Methods:** A prospective, randomized double blind manner to study the efficacy dexmedetomidine in the prevention of shivering including 60 patients undergoing cesarean section were included. Two groups were divided. Group D received intrathecal Inj. Bupivacaine 0.5% heavy (2 ml) + Inj. dexmedetomidine 5 g and Group C received intrathecal Inj. Bupivacaine 0.5% heavy (2 ml) + Inj. normal saline 0.05 ml. Both groups observed for occurrence of shivering and severity of shivering according bedside shivering assessment scale. **Results :** Dexmedetomidine was found to be effective in the prevention of shivering and reducing it's severity as only 4 patient had grade 1 and only 1 patient had grade 2 shivering among the 30 patients who were given dexmedetomidine compared to control group in which 9 patient had grade 1 and 8 patients had grade 2 shivering. **Conclusion :** It is concluded that adding 5 g dexmedetomidine to heavy bupivacaine (0.5%) in spinal anaesthesia can decreases the incidence and intensity of shivering without occurrence of significant adverse effect in patient undergoing cesarean section.

KEYWORDS : Dexmedetomidine, Spinal Anaesthesia, Shivering, Cesarean Section.**INTRODUCTION**

The mechanisms of shivering in patients undergoing surgery are mainly intraoperative heat loss, increased sympathetic tone, pain, and systemic release of pyrogens. Spinal anesthesia significantly impairs the thermoregulation system by inhibiting tonic vasoconstriction, which plays a significant role in temperature regulation. Spinal anesthesia also causes redistribution of core heat from the trunk to the peripheral tissues. These two effects predispose patients to hypothermia and shivering. Shivering increases oxygen consumption, lactic acidosis, carbon dioxide production and catecholamine secretion that increases heart rate, blood pressure, cardiac output and also intensify post operative pain.

A dexmedetomidine is among several pharmacological agents used for the treatment of shivering. Dexmedetomidine is a highly selective α_2 -adrenoceptor agonist with potent effects on the central nervous system without respiratory depression and it also has several desirable properties like sedation, anxiolysis, sympatholysis and analgesia.

However, when administered by intravenous route, dexmedetomidine can induce some negative side effects, such as bradycardia and hypotension. To decrease side effects, some clinicians choose to decrease the dose or change the administration route like intrathecally.

In this study it was hypothesized that intrathecal dexmedetomidine could decrease the incidence and intensity of shivering in patients undergoing Cesarean section without any significant adverse effect.

Aims and Objectives

To evaluate the effect of intrathecal Dexmedetomidine on -

- Reducing incidence of post spinal shivering.
- Reducing intensity of shivering.
- Haemodynamic parameters.
- Occurrence of complications.

MATERIALS AND METHOD

A randomized prospective study including 60 patients undergoing cesarean section were included. Two groups were divided. Group D received intrathecal Inj. Bupivacaine 0.5% heavy (2 ml) + Inj. dexmedetomidine 5 g and Group C received intrathecal Inj. Bupivacaine 0.5% heavy (2 ml) + Inj. normal saline 0.05 ml. Both groups observed for occurrence of shivering and severity of shivering according bedside shivering assessment scale.

All patients will be assessed pre-operatively in detail. All routine

investigations (CBC, RFT, LFT, RBS etc) will be performed. After detailed history taking patients will be assessed for general examination (build, nourishment, clubbing, cyanosis, lymphadenopathy, edema, increased JVP), systemic examination (RS, CVS, skin, spine, oral cavity, MPG), Vitals (temperature, Pulse rate, RR, SBP, DBP, SPO2).

Intravenous assess will be taken with 20G intravenous canula and intravenous ringer lactate will be started.

Technique

After reassurance, patients will be turn into left lateral position under strict aseptic and antiseptic condition, lumbar puncture will be perform at the level of L3-L4 intravertebral space using a 23G Quincke spinal needle. Once free flow of clear cerebrospinal fluid will be obtained, study drug for the patient (either dexmedetomidine or normal saline) according to the group they belong will be injected over 20 – 30 seconds and patient will be placed in supine position immediately and gently without raising the extremities.

Statistical Analysis

Quantitative data analyses by student T test and quantitative data by Chi square test. P value <0.05 will be considered to be significant and value <0.01 to be highly significant.

RESULTS

Most of the patients in the study belonged to age group 18-34 years, Mean age of patients in control group was 25.8 years, in dexmedetomidine group it was 25.70 years. P value was 0.916. Hence, not statistically significant.

The mean weight of patients in control group was 60.80 kg, dexmedetomidine group was 60.87 kg and the P value is 0.961 which is not statistically significant.

The mean height of patients in control group was 157.27 cm, dexmedetomidine group was 156.93 cm and the P value is 0.747 which is not statistically significant.

The number of patients who belong to ASA II were 2 in control group, 1 in dexmedetomidine group. The number of patients who belong to ASA III were 28 in control group, 29 in dexmedetomidine group. P value for this is 0.076 and hence, not significant.

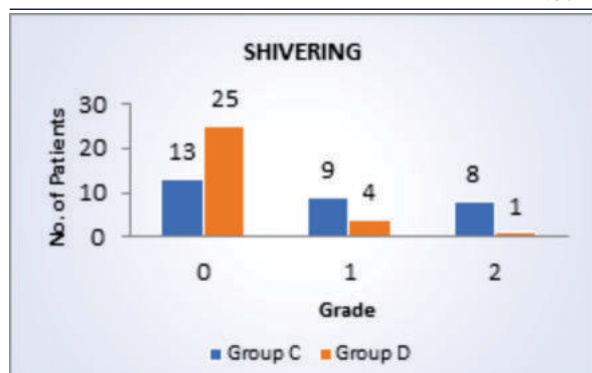


Figure - 1 : Showing Occurrence And Severity Of Shivering In Two Groups

The number of patients who had shivering grade 1 were 9 in control group and 4 in dexmedetomidine group. The number of patients who had shivering grade 2 were 8 in control group and 1 in dexmedetomidine group. Among control group 13 patients had no shivering and 25 patients among dexmedetomidine group had no shivering. p value for this is 0.003 which is significant.

In this study we found that 14, 12 and 4 patients had good, very good and excellent experience respectively in dexmedetomidine group.

In control group 15, 4 and 1 patients had good, very good and excellent experience respectively and 10 patients had poor experience.

Occurrence of nausea and vomiting are comparable in both the groups.

DISCUSSION

This study was planned in a prospective, randomized double blind manner to study the efficacy dexmedetomidine in the prevention of shivering. The study was double blinded wherein the patient and observer were blinded. In this study the sample size was calculated as 60 based on previous studies to obtain results of the study with a significance level of 0.05. On analysing the demographic profile, the distribution of age, weight and height of the patients in both the groups are comparable.

As shivering is a response to hypothermia, body temperature should be normally maintained within the normal limits of 36.5-37.5°C. 13 Major risk factors in regional anesthesia for hypothermia are aging, level of sensory block, and temperatures of the operating room and intravenous solutions. In our study, the temperature of the operating room was maintained at 21-22°C, and all fluids and drugs were at room temperature during the surgery.

Shivering

Dexmedetomidine was found to be effective in the prevention of shivering and reducing its severity as only 4 patients had grade 1 and only 1 patient had grade 2 shivering among the 30 patients who were given dexmedetomidine compared to control group in which 9 patients had grade 1 and 8 patients had grade 2 shivering. This result is in accordance with the report by Karim Nasseri, Negin Ghadami et al study which also had a similar outcome.

Patients who had shivering were given inj. Tramadol 50mg iv slow as rescue drug in both the groups.

Hemodynamic Stability

When used intravenously hypotension and bradycardia are known hemodynamic effects of dexmedetomidine but in our study where we used dexmedetomidine intrathecally, didn't noted such effect This result is in accordance with the report by Mostafa Mohammed Mohyeldin Abdelhamid, Azza Atef Abdel Aleem et al study which also had a similar outcome.

Side Effect

Occurrence of nausea and vomiting are same in both the groups which indicate that dexmedetomidine do not induce or prevent nausea vomiting.

No other side effect like hypotension, bradycardia, respiratory arrest are noted in our study

CONCLUSION

It is concluded that adding 5 g dexmedetomidine to heavy bupivacaine (0.5%) in spinal anaesthesia can decrease the incidence and intensity of shivering without occurrence of significant adverse effect in patient undergoing cesarean section.

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