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A COMPARATIVE STUDY TO EVALUATE THREE DIFFERENT DOSES OF DEXMEDETOMEDINE AN ADJUVANT IN SPINAL ANAESTHESIA- A SINGLE INSTITUTIONAL STUDY AT A TERTIARY CARE CENTRE

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ABSTRACT

Back Ground and Objective: Spinal anaesthesia is one of the most common method of regional anaesthesia that is used commonly for lower limb surgeries and for abdominal surgeries. In the past few years the number of surgeries have been increased, as a result of awareness of the people and the increase in the number of modern techniques which are safe along with the other advances that have occurred in the field of medical technology. For providing spinal anaesthesia the most common drug that is used is bupivacaine and the most common adjuvant agent used is dextometiditne. Hyperbaric bupivacaine when used as a spinal anaesthetic agent helps to provide good motor and sensory block that involves most of the lower abdomen and lower limb and hence helps to give a good anaesthesia during the procedure and also provide good for post operative pain relief for a good amount of time. But when bupivacaine is used alone, the duration of sensory motor and post operative analgesia is very limited. Hence in order to enhance the duration of motor and sensory block the postoperative analgesia and the patient compliance adjuvant agents are routinely being used in spinal anaesthesia and dextometiditne

is a drug that when added to the primary anaesthetic agent for long duration of anaesthesia and helps in a good sensory and motor blockade. Various studies that have done have shown that when various dosages of the adjuvant agent added to the primary anaesthetic agent in spinal anaesthesia the effect is good with reduction in the number of side effects. Though various studies have been done to compare the various dosages of drugs at present in South India no major study has been undertaken to evaluate the different doses of adjuvant in spinal anaesthesia. In view of all the above said the present study was undertaken to evaluate and find out the best possible optimum dose of dextometiditne in spinal anaesthesia. **Methods:** A Quasi experimental Study was started after approval from the ethical committee and written informed consent On 60 consenting ASA Grade 1 and 2 patients undergoing lower abdominal or lower limb surgeries between age group of 20 to 60 yrs in Father Muller Medical College Hospital, Mangalore who was admitted during the period of November 2017 to October 2019 for lower abdominal and lower limb surgeries under spinal anesthesia. 3.5ml of 0.5% hyperbaric bupivacaine was used in in spinal anesthesia Then patients were divided into three groups of 20 patients who received varying doses of adjuvant dexmedetomidine as follows Group D5, Group D10 and Group D20. **Results** In the present study we had the mean age was 35.60 years 33.45 years and 38.10 years in the Group D5 Group D 10 and Group D 20 respectively. there was no significant difference between the groups the p value by ANOVA was more than 0.05 hence the groups are comparable. In the present study we had the 10 females, 11 females 10 females and 10 males 9 males and 10 males in the Group D5Group D10 and Group D20 respectively. there was no significant difference between the groups the p value by ANOVA was more than 0.05 hence the groups are comparable. In the present study we had a mean BMI of 19.3 kg/ m^2 19.15 kg/ m^2 and 20 kg/ m^2 in the Group D5, Group D10 and Group D20 respectively. there was no significant difference between the groups the p value by ANOVA was more than 0.05 hence the groups are comparable. In the present study when we evaluated the heart rate, systolic blood pressure, diastolic blood pressure, and the mean arterial pressure in the various study groups we had at 0 there was no statistical significance between the groups just before laryngoscope with a p value by ANOVA was more than 0.05.but 2 and 1 minutes, 3 minutes and 5 minutes after intubation there was a statistical significance between the groups with the p value by ANOVA was more than 0.05 Highest difference was noted at 2 There was least variation in those Group D5 as those in Group D10 and highest with Group D20. **Conclusion:** In the study we concluded that the best dose effectively increase the the the duration of motor and sensory block without hemodynamically significant variations. we found that to add to spinal as an adjuvant is 10

microgram of dextometiditne is the best as it is associated with a faster onset and an adequate motor and sensory block for the time required for surgery.

KEYWORDS: But when bupivacaine is used alone, the duration of sensory motor and post operative analgesia is very limited.

INTRODUCTION

Spinal anaesthesia is one of the most common method of regional anaesthesia that is used commonly for lower limb surgeries and for abdominal surgeries.[1]

In the past few years the number of surgeries have been increased, as a result of awareness of the people and the increase in the number of modern techniques which are safe along with the other advances that have occurred in the field of medical technology.[2] For providing spinal anaesthesia the most common drug that is used is bupivacaine and the most common adjuvant agent used is dextometiditne.[3,4] Hyperbaricbupivacaine when used as a spinal anaesthetic agent helps to provide good motor and sensory block that involves most of the lower abdomen and lower limb and hence helps to give a good anaesthesia during the procedure and also provide good for post operative pain relief for a good amount of time.[5,6] But whenbupivacaine is used alone, the duration of sensory motor and post operative analgesia is very limited.[5,6]

Hence in order to enhance the duration of motor and sensory block the postoperative analgesia and the patient compliance adjuvant agents are routinely being used in spinal anaesthesia[7-10] and dextometiditne is a drug that when added to the primary anaesthetic agent for long duration of anaesthesia and helps in a good sensory and motor blockade.[11-15] Intrathecal alpha 2 receptor agonist like that dextometiditne are found to be very effective as they have a good action for both somatic pain and visceral pain. Various studies that have done have shown that when various dosages of the adjuvant agent added to the primary anaesthetic agent in spinal anaesthesia the effect is good with reduction in the number of side effects.[16-21] Dextometiditne is the most common agent that is used with bupivacaine and the dosages that have been tried are five microgram, 10 microgram and, 20 microgram.[16-17] Though various studies have been done to compare the various dosages of drugs at present in South India no major study has been undertaken to evaluate the different doses of adjuvant in spinal anaesthesia.

In view of all the above said the present study was undertaken to evaluate and find out the best possible optimum dose of dextometiditne in spinal anaesthesia.

In our study we compared 5 microgram 10 microgram and 20 microgram of decks to see which of the above three doses provides a good benefit with minimum side effects, The aim of the present study was to evaluate the onset of anaesthesia the duration of sensory and motor blockage and the hemodynamic changes that occurred with the three doses of adjuvants keeping the primary anaesthetic drug bupivacaine at the same concentration.

MATERIALS AND METHODS

Source of data

On 60 consenting ASA Grade 1 and 2 patients undergoing lower abdominal or lower limb surgeries between age group of 20 to 60 yrs in Father Muller Medical College Hospital, Mangalore who was admitted during the period of November 2017 to October 2019 for lower abdominal and lower limb surgeries under spinal anesthesia.

METHODOLOGY

The study was a Quasi experimental Study was started after approval from the ethical committee and written informed consent from 60 patients. All patients undergo thoroughpreparation, premedication and uniform type of monitoring intra-operatively. Under all aseptic precautions Spinal anaesthesia is administered using Quincke needle 23G or 25G in L3-L4, L2-L3 spaces using 15 mg 0.5% hyperbaric bupivacaine. Depending upon the group, dexmedetomedine was used as an adjuvant.

Then patients were divided into three groups.

Group D5(dexmedetomidine 5mcg):In this group 20 patients were studied who received dexmedetomidine5mcg as an adjuvant to 3.5ml of 0.5% hyperbaric bupivacaine in spinal anesthesia.

Group D10 (dexmedetomidine 10mcg): In this group 20 patients were studied who received dexmedetomidine 10mcg as an adjuvant to 3.5ml of 0.5% hyperbaric bupivacaine in spinal anesthesia.

Group D20 (dexmedetomidine 20mcg): In this group 20 patients were studied who received dexmedetomidine 20mcg as an adjuvant to 3.5ml of 0.5% hyperbaric bupivacaine in spinal anesthesia.

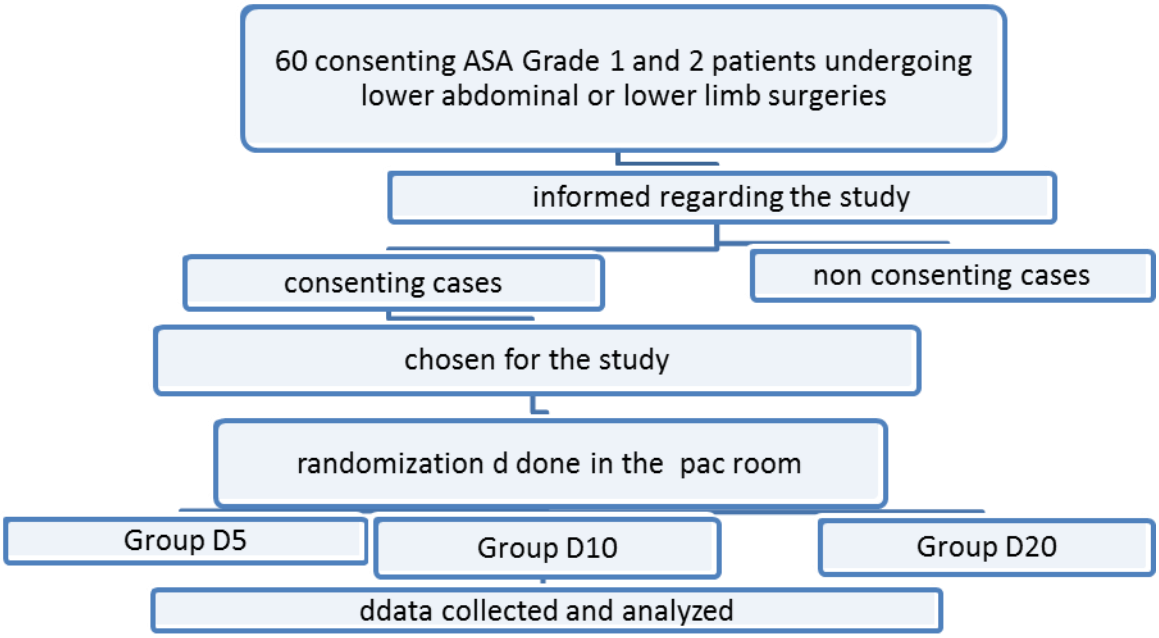

Figure 1: Consort diagram of the study.

After completing spinal injection, patients was placed supine, patients was evaluated for sensory and motor blocks every 3 minutes until readiness to surgery, then every 5 minutes until maximum level of sensory block was reached.

Following the surgery assessment was done for the first one hour every 15 minutes then hourly till ambulation.

At same observation times systolic and diastolic blood pressure values, heart rate, and saturation were recorded.

Expected adverse effects of dexmedetomedine like respiratory depression (RR<8 or SpO2 <95%) was treated with O2 supplementation or respiratory support if required.

Standard of care

Hypotension defined as a decrease of systolic blood pressure by >30% from baseline or a fall below 90 mm Hg, was treated with incremental iv doses of 6 mg of injection mephentermine and iv fluid as required. Bradycardia, defined as heart rate (HR) below 50 bpm, was treated with 0.3-0.6 mg of iv atropine.

The level of sensory block was assessed using the loss of pinprick sensation (24- Gauge hypodermic needle); where as motor block was assessed using modified Bromage scale (0 = no motor block, 1 = hip blocked, 2 = hip and knee blocked, 3 = hip, knee and ankle blocked).

Readiness to surgery was defined as loss of pinprick sensation >/= T10, with modified bromage score >/= 2.

60 healthy consenting patients (ASA 1 or ASA 2) divided in three groups
Group D5 (dexmedetomidine 5mcg) = 20 cases
Group D 10 (dexmedetomedine 10mcg) = 20 cases
Group D 20 (dexmedetomedine 10mcg) = 20 cases
Sampling technique- Convenient sampling technique

RESULTS AND OBSERVATIONS

In the present study we had the mean age was 35.60 years 33.45 years and 38.10 years in the Group D5 Group D 10 and Group D 20 respectively. there was no significant difference between the groups the p value by ANOVA was more than 0.05 hence the groups are comparable. In the present study we had the 10 females, 11 females 10 females and 10 males 9 males and 10 males in the Group D5Group D10 and Group D20 respectively. there was no significant difference between the groups the p value by ANOVA was more than 0.05 hence the groups are comparable. In the present study we had a mean BMI of 19.3 kg/ m^2 19.15 kg/ m^2 and 20 kg/ m^2 in the Group D5, Group D10 and Group D20 respectively. there was no significant difference between the groups the p value by ANOVA was more than 0.05 hence the groups are comparable.

In the present study when we evaluated the heart rate, systolic blood pressure, diastolic blood pressure, and the mean arterial pressure in the various study groups we had at 0 there was no statistical significance between the groups just before laryngoscope with a p value by ANOVA was more than 0.05. but 2 and 1 minutes,3 minutes and 5 minutes after intubation there was a statistical significance between the groups with the p value by ANOVA was more than 0.05 Highest difference was noted at 2 There was least variation in those Group D5 as those in Group D10 and highest with Group D20.

DISCUSSION

The relief of pain and suffering as possible one of the most important concerns that has haunted mankind since the evolution of the history of medicine acute pain is defined as an unpleasant sensory and effective experience normally associated with injury the acute paid arises from activation of the various components of the peripheral nervous system and damages for complex higher level processing postoperative pain is arguably one of the most

important medical dilemma that not only gives the patience and unpleasant experience but also has associated with at various hemodynamic changes and stress responses intern causing an outcome that is not desired in the postoperative period full stop fully controlled pain following any surgery is associated with an to word postoperative consequences like the patient suffering distress confusion respiratory and cardiac pathology and prolongation of the hospital stay providing a good effective postoperative analgesia what are the most important concern for any surgeon and NST test involved in a surgery with adequate postoperative analgesia magnitude of the stress response that occurs following a neuroendocrine activation the postoperative pulmonary complications and the incidence of postoperative cardiac events like myocardial ischemia are reduced regional blocks about the most common techniques that have been provided to provide anaesthesia among which spinal anaesthesia is the one which provides most common anaesthesia technique for any surgery that involves the abdomen and the lower limbs.

K Sudheesh, and co-workers in a study that was done in the year 2015 on 50 ASA class 1and ASA class 2 patients planned for elective perianal surgeries were randomly allocated to two groups to receive two different doses of Dexmeditomedine, 3 microgram and 4 microgram dextometiditne they recorded the onset and duration of sensory and motor blockade, duration of analgesia, time for ambulation and first urination was noted, and they found that onset of sensory block and motor block, was prolonged with patients who received 5mcg dexmedetomidine as adjuvant to 0.5% hyperbaric bupivacaine. They concluded that intrathecal dexmedetomidine 3mcg dose does not produce faster ambulation compared to intrathecal dexmedetomidine 5mcg though it produces comparable duration of analgesia for perianal surgeries.

Sisinti Sanjeeb Patro and co-workers in a study that was done in the year 2016 on 60 ASA class 1and ASA class 2 patients planned for electiveinfraumbilical surgeries 2016 studied evaluation of dexmedetomidine as an adjuvant to intrathecal bupivacaine in infraumbilical surgeries. They studied among the 60 patients undergoing infraumbilical surgeries under spinal anesthesia allocated to two groups to receive two different doses of Dexmeditomedine 5 microgram and 15 microgram dextometiditne found that onset of sensory block was 129.33±14.8 seconds in the second group and 208.33±19.18 seconds in the first group and total duration of motor block was 286.33±15.15 minutes and 166.5±12.11 minutes in group 2 and group 1 respectively. Duration of analgesia was 333.6±20.67 minutes with

dexmedetomidine but 193.67±7.06 minutes in bupivacaine group alone. They concluded thatdexmedetomidine as an adjuvant had shown early onset of sensory and motor blockade with longer duration of analgesia and hemodynamic stability than with bupivacaine alone.

Ghanem, and co-workers in a study that was done in the year 2016 on 60 ASAclass 1ASA class 2 and ASA class 32 patients planned for electivevaginal hysterectomy were studiedallocated to two groups to receive two different doses of Dexmeditomedine5 microgram and 15 microgram dextometiditne They concluded that 10mg plain bupivacaine supplemented with 5µg dexmedetomidine produce prolonged motor and sensory block compared with 25µg fentanyl.

Shukla Laleh et al compared the hemodynamic parameters compare with different doses of dextometidine in orthopaedic surgeries that were done on the lower limb and they found that 10 microgram dextometiditne was the best to achieve the fastest onset of sensory block. Zhang and co-workers. increasing doses of the faster onset of sensory and motor analgesia along with prolongation of the duration of motor and sensory analgesia but the side effects of hypertension and change in heart rate where higher with increase in the dose of adjuvant with 10microgram better than 5 microgram dextometiditne.

Shaikh and co-workers faster onset of sensory and motor analgesia along with prolongation of the duration of motor and sensory anaesthesiaadjuvant with 10microgram of dextometiditne provided clinically effective effect better than 5 microgram.

CONCLUSION

In the study we concluded that the best dose effectively increase the the the duration of motor and sensory block without hemodynamically significant variations. we found that to add to spinal as an adjuvant is 10 microgram of dextometiditne is the best as it is associated with a faster onset and an adequate motor and sensory block for the time required for surgery.

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