Original Research Article

A To evaluate the effects of intrathecal clonidine as adjuvant to 0.5% bupivacaine (heavy) in lower abdominal surgeries

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Abstract

Background -Regional anaesthesia is one of the most preferred technique for lower abdominal and lower limb surgeries. It allows the patient to remain awake and minimizes problem associated with airway management. The technique is simple to perform and the onset of anaesthesia is more rapid than epidural anaesthesia, allowing the surgical incision to be made sooner. Clonidine, an α2 adrenergic agonist, has a variety of different actions. Clonidine has antihypertensive properties and the ability to potentiate the effects of local anaesthetics[10]. Clonidine has been shown to result in the prolongation of the sensory and motor blockade and the reduction in the amount or the concentration of local anaesthetic required to produce post-operative analgesia present study was designed to evaluate the effects of clonidine as an adjuvant to 0.5% bupivacaine (heavy), given intrathecally for prolonging the duration of analgesia. **Materials and Methods**-Present clinical study was conducted at MGM Medical college, kamothe, Navi Mumbai, the study was undertaken to compare the efficacy of clonidine as an adjuvant to 0.5%bupivacaine (heavy) for subarachnoid block in lower abdominal surgeries. It was prospective randomised control study done on 60 patients undergoing elective lower abdominal surgeries. Onset of analgesia was assessed by loss of sensation to pin prick every 30 seconds till the level of T10 dermatome was achieved. Following scales where used to assess duration of action of the drug Modified Bromage Scale, Visual Analog Score , Sedation Score. **Results and Conclusion**- The prolongation in duration of analgesia in clonidine group was statistically significant ($p<0.05$). It also prolongs the duration of motor blockade and analgesia in addition produces sedation with haemodynamic stability.

Keywords – Spinal Anesthesia, Clonidine, Abdominal Surgery, Bupivacaine, Modified Bromage Scale, Visual Analog Score, Sedation Score

Introduction

Regional anaesthesia is the preferred technique for most of lower abdominal and lower limb surgeries. Opioid analgesics can produce serious side effects like late and unpredictablerespiratory depression[7,8], post-operative nausea and vomiting, pruritus, urinary retention and activation of herpes labialis[9]. Clonidine hasthe ability to potentiate the effects of local anaesthetics[10]. Clonidine has been shown to result in the prolongation of the sensory and motor blockade and the reduction in the amount of local anaesthetic required to produce post-operative analgesiaand minimal side. The study is designed to evaluate the effects of clonidine as an adjuvant to 0.5% bupivacaine (heavy), given intrathecally forprolonging the duration of analgesia.

Materials and methods

Present clinical study was conducted at MGM Medical college ,kamothe, Navi Mumbai, during the periodNovember 2011 to September 2013. After obtaining approval from institutional ethical committee. It was prospective randomised control study done on 60 patients undergoing elective lower abdominalsurgeries.

Inclusion criteria

A total of 60 patients of American Society of Anaesthesiologist (ASA) grade I and II between Age group 20-50 years of either gender where taken for elective lower abdominal surgeries.

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Exclusion criteria

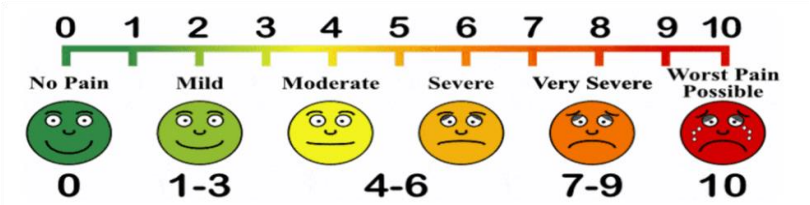
Patients with known allergy to study drug, neurological disorders. spine deformities, coagulation disorders, local infections at site of injection and refusal were excluded from the study.

After a thorough clinical examination and relevant laboratory investigations of all patients, an informed, valid, written consent was obtained, both for conduct of study as well as administration of spinal anaesthesia. All patients were kept nil by mouth from midnight before surgery and tablet alprazolam (0.01mg/kg)was administered at bed time the day before surgery All the patients were re-examined, assessed and weighed pre-operatively on the day of surgery. Intravenous access was established with a 18G intravenous access and preloading was done with 15 ml/kg Lactated Ringer's solution 30minutes before procedure. Anaesthesia machine and accessories were checked and drugs, including emergency drugs were kept ready. Also monitoring equipment's like pulse oximeter, non-invasive blood pressure(NIBP) and electrocardiogram(ECG) monitors were checked and applied to each patient on arrival to the operating room and baseline parameters were recorded. All the patients were randomly allocated into two groups of 30 each using computer generated random numbers by simple randomization technique.

- Group 1 (Clonidine): Inj.Bupivacaine and Inj.Clonidine group.
- Group 2 (Control): Inj.Bupivacaine and Saline group.

Under strict aseptic conditions, with the patient in the left lateral position, a lumbar puncture was performed at L3-L4 intervertebral

space. After ensuring free flow of CSF, Group 1 patients received 0.5% heavy bupivacaine 3ml with clonidine (30µgm) 0.2ml and Group 2 patients received 0.5% heavy bupivacaine 3ml with 0.9% saline 0.2ml. After the intrathecal injection patients were returned to supine position. Haemodynamic parameters such as pulse rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and SpO_2 of the patients were recorded. Onset of analgesia was assessed by loss of sensation to pin prick every 30 seconds till the level of T10 dermatome was achieved. Intensity of motor blockade was assessed by modified bromage scale every 2 minutes for first 10 minutes Duration of sensory blockade was assessed by two segments regression. Duration of analgesia was assessed from the onset of subarachnoid block to the time of administration of rescue analgesia. Duration of motor blockade assessed through modified bromage scale. Heart rate, systolic, diastolic blood pressure and mean arterialpressure, wererecorded every 2minutes for first 10minutes, every 10minutes for first 30minutes, every 30minutes till 3hours and every 60minutes till the requirement of rescue analgesia. ECG, SpO_2 andsedation were monitored continuously. Side effects if any like nausea, sedation, dry mouth, bradycardia were recorded during study period.



Visual Analog Scale

Duration of analgesia was defined as the time from subarachnoid block to VAS>2, at that point rescue analgesia was given.

Sedation score

0-No sedation1-Drowsiness, 2-Asleep but arousable,3-Unarousable with loss of verbal contact

All the data was collected, tabulated and analysed statistically.

P<0.05 was considered significant.

Statistical Analysis

Patients were allotted in A and B group through randomization. Students unpaired t-test was used for statistical analysis. It was used because two sets of population were compare which were independent and identically distributed. The demographic profile (age, age wise distribution,gender wise distribution, weight ,weight wise distribution, height ,height wise distribution)was comparable in both the groups but p value was more than 0.05.

Result

	Group1	Group2	P value
Time of onset of analgesia	2.25±0.18	2.5±0.19	P<0.05
Time of onset of motor blockade	8.51±0.175	9.32±0.14	P<0.05
Time of two segment regression	210.50±6.86	125±5.08	P<0.05
Duration of motor blockade	220±9.55	155.2±6.22	P<0.05
Duration of analgesia	650±9.22	230.2±26.05	P<0.05

Comparison of occurrence of post operative Complications in both groups (N=60)

Complications	Group1 (n=30)	Group2 (n=30)
Nausea	4(13.33%)	2(6.66%)
Sedation	2(6.66%)	0(0%)
Dry mouth	3(9.99%)	1(3.33%)

Post-operative, nausea, sedation and dry mouth are more in group1 (clonidine group).

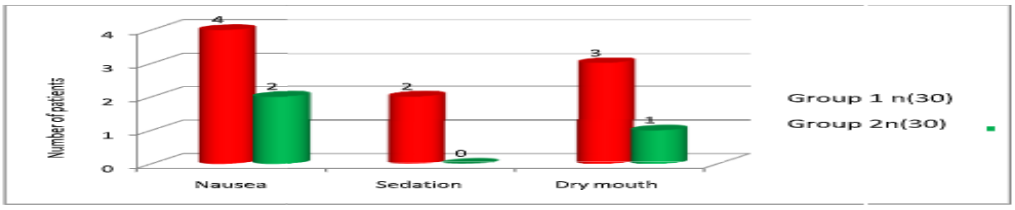
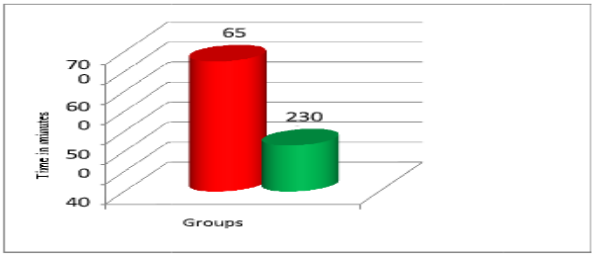
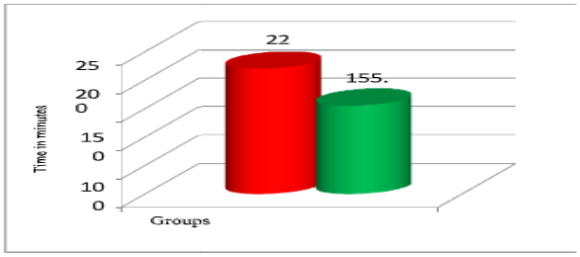


Fig 1: Occurrence of post-operative complications in both the groups.

Group 1(n=30)
Group 2(n=30)



Mean duration of analgesia in both the groups (n=30)



Mean duration of motor blockade in both the groups (n=30)

Discussion

Using adjuvants along with local anaesthetics for spinal anaesthesia can meet cost effective way of providing analgesia. Commonly used local anaesthetics for intrathecal anaesthesia are lignocaine and bupivacaine in India. Bupivacaine 0.5% heavy has more prolonged action compared to lignocaine. Its drawback is limited duration of post-operative analgesia. Hence, an intrathecal adjuvant to these local anaesthetics forms a reliable method of prolonging post-operative analgesia. Spinal opiates prolong the duration of analgesia, but they do have drawbacks of late and unpredictable respiratory depression, pruritis, nausea, vomiting and urinary retention[45], which requires constant postoperative monitoring and urinary catheterisation. So in this context clonidine may be a very useful drug. Clonidine is a selective partial α_2 adrenergic agonist. It is known to potentiate both sensory and motor block of local anaesthetic. The analgesic effect of clonidine is mediated spinally through activation of post synaptic α_2 receptors in substantia gelantinosa of spinal cord. It also activates the descending inhibitory pathways (medullospinal pathways) and there by decreases the release of nociceptive substances from substantia gelatinosa. It blocks the conduction of Aδ and C fibres, increases potassium conductance in isolated neurons in vitro and intensifies conduction block of local anaesthetic agents. Various authors have studied clonidine for its analgesic action when it is used as an adjuvant along with local anaesthetic without the side effects of opioids. Oral clonidine has been used to prolong the duration of intrathecal bupivacaine analgesia. In India clonidine has been introduced recently in parenteral form. Hence present study was undertaken to evaluate the effectiveness of clonidine as an adjuvant in spinal anaesthesia with 0.5% bupivacaine (heavy) for prolonging duration of analgesia.

Conclusion

From the present study it is concluded that addition of 30µg of clonidine to 3ml of 0.5% bupivacaine(heavy)intrathecally for spinal anaesthesia for lower abdominal surgeries has the following advantages. It prolongs the duration of motor blockade and analgesia, provides sedation and patients are easily arousable, haemodynamically stable, not associated with side effects like pruritus and respiratory depression and hence can be an attractive alternative for opioids for prolonging spinal analgesia and finally prolongs the duration of post-operative analgesia hence decreasing the need of rescue analgesic drugs.

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