comparative study of intrathecal bupivacaine with fentanyl and medazolam for quality of anaesthesia and duration of post operative pain relieve in patient undergoing orthopaedic surgery.

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Abstract

The use of adjuvant to spinal anaesthesia has gained popularity nowdays , improve the quality of anaesthesia and post operative pain relieve is mandatory for patient care and to reduce complication , in this retrospective randomized study taken among 120 patient divided into 3 groups a,b and c in the A group received bupivacaine 0.5 % heavy (marcaine) , B group received 0.5 % bupivacaine 2.5 ml plus 25 microgram fentanyl, C GROUP received 0.5% bupivacaine plus 2.5 mg midazolam after preloading of fluid (normal saline) and montoring of vital sign and postoperative pain , the result showed that intrathecal medazolam and fentanyl along with bupivacaine can be used safely used ,requirement of postoperative analgesia was greatly reduced with fentanyl and medazolam group than with bupivacaine alone also quality of anaesthesia and duration of anaesthesia also improved in b,c group than in A group.

Introduction

Fentanyl, a phenylpiperidine derivative, is a synthetic μ opioid receptor agonist. It is preferred as an adjuvant in spinal anaesthesia because of its rapid onset and short duration of action with lesser incidence of respiratory depression. Intrathecal Fentanyl improves the quality of spinal anaesthesia without any deleterious side effect (hunt et al 1989) Discovery of benzodiazepine receptors in spinal cord triggered the use of intrathecal Midazolam for analgesia (Mohler & Okada, 1977). Several investigators have shown that intrathecal or epidural administration of Midazolam produces a dose dependent modulation of spinal nociceptive processing in animals and humans and is not associated with neurotoxicity, respiratory depression or sedation (Naguib et al, 1995). This study was designed to evaluate the characteristics of the spinal block achieved with the use of adjuvants with Bupivacaine

Material and Method

this was retrospective study done on 120 pateint ,ASA 1 TO 3 before that history had been taken and physical examination any patient with contraindication to regional anaesthesia had been excluded from this study also any drug allergy was also excluded , all patient were explaind about ten point visual analoge scale (vas)

Written informed consent was obtained from all patients. Patients were randomly allocated to 3 groups of 40 each to receive either 2.5ml injection Bupivacaine (H) (Group A) or(Group B) 2.5ml injection Bupivacaine (H) + 0.5 ml injection Fentanyl 25μg

(Group C) or 2.5ml Injection Bupivacaine (H) + 0.5ml injection Midazolam 2.5mg All the study drugs were introduced intrathecally, and the total volume of agents administered was 3 ml. In the operation theatre, monitors were attached to the patient and parameters like heart rate, systemic arterial pressure and peripheral arterial

oxygen saturation were noted. All patients were preloaded with 10ml/kg of Ringer lactate

In a sitting position, under all aseptic precautions and using midline approach, subarachnoid block was achieved in L3-L4 space with 22G Quincke's spinal needle. Drug was injected as per the assigned group. Patient was immediately placed in the supine position. All patients received oxygen supplementation via Hudson's mask at a rate of 4 L/min. The onset of sensory analgesia and motor blockade were tested. The level of sensory anesthesia, defined as the loss of sharp sensation by using a pinprick test (20 gauge hypodermic needle), was recorded bilaterally at the mid-clavicular line. was noted. Patient's heart rate, blood pressure, respiratory rate, oxygen saturation were monitored Time taken to achieve highest sensory level every minute initially for 5 minutes, then at 5 minute interval for next 30 minutes and then every 10 minutes till the end of surgery. Regression of motor blockade and duration of postoperative analgesia was noted. Visual Analogue Scale was used for assessment of postoperative pain relief. At a score of 5, Injection Diclofenac 75mg was given intramuscularly as a rescue therapy. In the present study, hypotension was defined as a decrease of systolic blood pressure more than 20% of baseline. It was treated with intravenous (IV) fluids and Injection Ephedrine Hydrochloride. Bradycardia was defined as a decrease in pulse rate to less than 60 per min and was treated with IV injection of Atropine Sulphate 0.6mg. All patients were observed for next 24 hours. Any period during operative and postoperative period till 24hrs was recorded and treated accordingly.

Results:

The study & control groups did not differ significantly with respect to any demographic variables (Table I).

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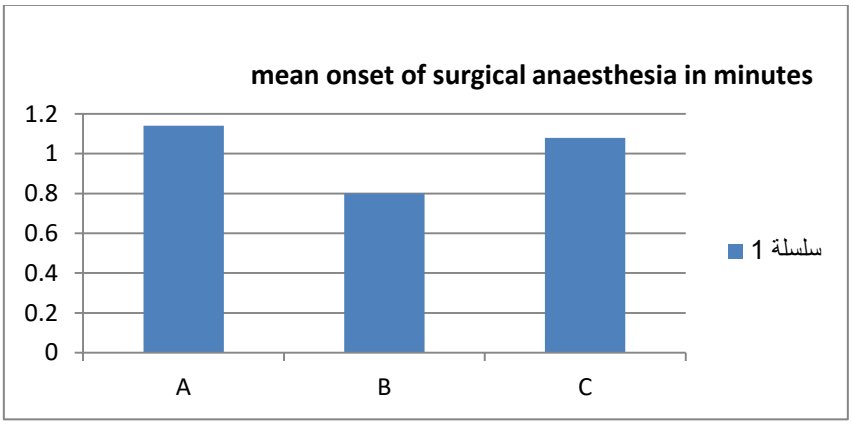
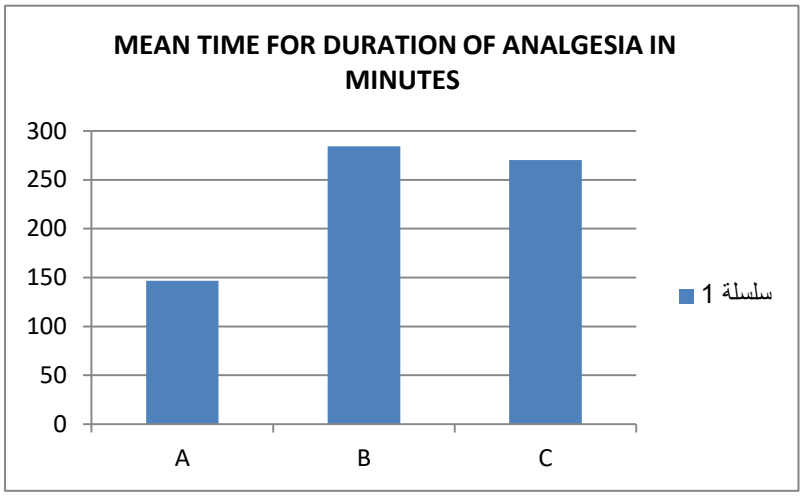
Fig.I: Mean time for surgical anaesthesia in Min.

Fig.II: Mean total duration of analgesia. ------- A. Bhure, N. Kalita, P. Ingley & C.P. Gadkari Fentanyl and Midazolam groups as compared to the control group($p<0.001$) & was also statistically significant when compared with each other. When group A was





Duration of analgesia, for group B was 284.5,group C was 270.3 and group A was 146.83 ± 26.60 minutes .compared to Fentanyl, Midazolam and Control groups ($p<0.001$). The duration of analgesia with Fentanyl was 284.66 minutes as is line with earlier studies by Biswas et al (2002) and Belzarena (1992); 12.5µg Fentanyl produced analgesia that lasted for 248 ± 11 minutes (Biswas et al, 2002) and duration of analgesia with 25µg Fentanyl was noted to last for 305 ± 89 minutes (Belzarena, 1992).The duration of analgesia with Midazolam was 270.54 ± 36.22 minutes in the present study. A preclinical study has demonstrated the potential role of spinal benzodiazepine receptors in segmental anti-nociceptive action of intrathecal midazolam.Administration of benzodiazepine antagonist flumazenil and GABA-A antagonist (Bicuculline) has been reported to reverse the analgesic effect of intrathecal Midazolam, suggesting that antinociceptive action is mediated via benzodiazepine/ GABA-A receptor complex which are abundantly present in lamina II of dorsal horn ganglia of spinalcord (Edwards et al, 1990). Hypotension and bradycardia are the most commonly reported adverse events. In the present study, hypotensionoccurred but was not statistically significant. ($p=0.94$). This could be because all patients in the present study were preloaded with 10ml/kg of Ringerlactate the mechanism of side effect were different among the study group, their incidence is comparable ,and data was not significant statistically.

Side effect	Group A	Group B	Group C	P VALUE
hypotension	15 (30%)	15(30%)	10 (25%)	0.96
bradycardia	1(2.5%)	1(2.5%)	----------	0.56
Nausea and vomiting	3	2	----------	0.13
shivering	5(13%)	4(10%)	----------	0.5
itching	----------	2(5%)	----------	0.10
sedation	----------	----------	6(15%)	0.05

Discussion

compared to Fentanyl, Midazolam and Control groups ($p<0.001$). The duration of analgesia with Fentanyl was 284.66 minutes as is line with earlier studies by Biswas et al (2002) and Belzarena (1992); 12.5µg Fentanyl produced analgesia that lasted for 248 ± 11 minutes (Biswas et al, 2002) and duration of analgesia with 25µg Fentanyl was noted to last for 305 ± 89 minutes (Belzarena, 1992).

The duration of analgesia with Midazolam was 270.54 ± 36.22 minutes in the present study. A preclinical study has demonstrated the potential role of spinal benzodiazepine receptors in segmental anti-nociceptive action of intrathecal midazolam.Administration of benzodiazepine antagonist flumazenil and GABA-A antagonist (Bicuculline) has been reported to reverse the analgesic
effect of intrathecal Midazolam, suggesting that antinociceptive action is mediated via benzodiazepine/ GABA-A receptor complex which are abundantly present in lamina II of dorsal horn ganglia of spinal cord (Edwards et al, 1990). Hypotention and bradycardia are common side effect but in this study was rarly occurred because of preloading with 10 ml / kg ringer lactate or normal saline , itching occurred in 2 patient with fentanyle group , nausea and vomiting occure in 3 of bupivacaine alone and 2 of fentanyle group , sedation occure in 6 of midazolam group but they are easy arousable

Conclusion

The present study demonstrated that addition Fentanyl and Midazolam to Bupivacaine significantly improves the onset and duration of sensory and motor block with relative haemodynamic stability, prolongs the duration of analgesia and reduce the consumption of systemic analgesics in comparison to Bupivacaine alone. Hence, we suggest that addition of preservative free fentanyle and midazolam is excellent additive to Bupivacaine for quality of anaesthesia and prolonged duration of analgesia.

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