



COMBINED EFFECT OF CLONIDINE AND BUPIVACAINE DURING HERNIOPLASTY – A CASE STUDY

Anaesthesiology

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ABSTRACT

A 95-year-old male patient came with the complaints of swelling and pain over left inguinal region and further underwent hernioplasty. During this procedure surgical anaesthetics were administered which were bupivacaine and clonidine. This study was done to reveal the benefit of clonidine as an adjuvant therapy to bupivacaine. The objective of this study was to prove that low doses of clonidine along with bupivacaine showed no side effects, and well-maintained systolic blood pressure with analgesia for longer period of time. [1]

KEYWORDS

Anaesthetics, bupivacaine, clonidine, adjuvant therapy

INTRODUCTION

Bupivacaine and clonidine are two anaesthetics which when given together may benefit in prolonged analgesia and increases the anaesthetic effect. Bupivacaine is a local anaesthetic which works by blocking the generation and conduction of nerve impulse through reducing the propagation of nerve impulse and rate of increase in action potential. Clonidine is an alpha-2 adrenergic agonist which stimulates the alpha-2 adrenergic receptors in the brain which leads to decreased sympathetic outflow from central nervous system, reduction in peripheral resistance, renal vascular resistance, heart rate and blood pressure. The addition of intrathecal clonidine produces analgesia, to relieve pain which may be dose dependent and along with bupivacaine it also lengthens the spinal analgesia^[7] Contrasting with other spinal opioids clonidine does not produce respiratory depression. A systolic blood pressure is the pressure exerted by the blood on the artery when the heart beats. Most of the medications given for treatment may affect the systolic blood pressure, the combination of the bupivacaine and clonidine given before surgery as anaesthetics do not interfere with the systolic blood pressure.

CASE STUDY

A 95 years old male patient was admitted to the general surgery department of our hospital. On arrival he complained of swelling over left inguinal region associated with pain. On enquiry, it was revealed that he had undergone right inguinal region hernioplasty, three years back. It was also revealed that he had dementia and hypertension. He was conscious, oriented and afebrile on physical examination. His vitals were as follows: Temperature was normal (96 F). Pulse rate was elevated (109 beats/min). Respiratory rate was slightly elevated (24 breaths/min), blood pressure was almost normal (110/80mmHg).

The CT chest plain report revealed a few peripheral fibrosis with traction bronchiectasis along the ECHO cardiography report revealed tachycardia, mild MVP (Mitral valve prolapse) of both AML (anterior mitral leaflet), sclerotic aortic valve and LVH with LVDD. Hematology report showed that RBC and Hb were slightly low and MCHC and creatinine were slightly high.

The patient was diagnosed with OBSTRUCTED LEFT INGUINA HERNIA. So, a hernioplasty procedure was planned on the day of admission.

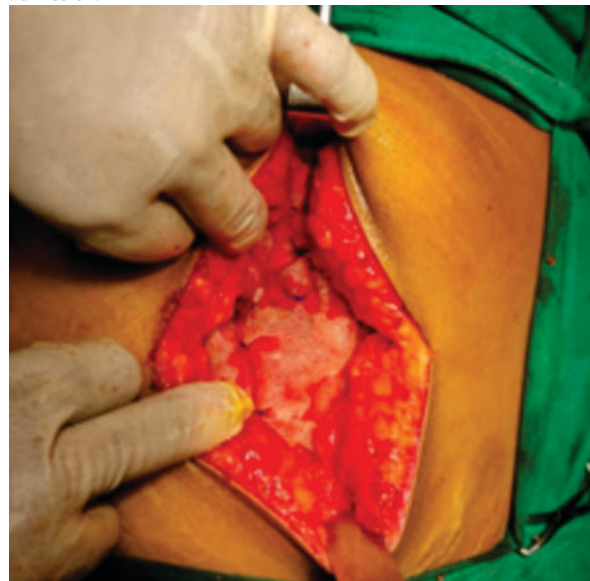


Figure 1: Hernia
Source: Vivekanandha Medical Care Hospital

TABLE – 1 PRE-MEDICATIONS GIVEN

DRUG	DOSE	ROUTE
Inj. TT	0.5 ml	IM
Inj. Lidocaine	0.2ml	ID
Inj. Amiodarone	150mg	IV
Inj. Ceftriaxone	1g	IV

Prior to surgery, the patient was made to sit upright with the heads tilted to the front and spinal anesthesia was injected by a specialized anesthetist. The anesthesia was injected into the subarachnoid space containing CSF. A combination of spinal anesthesia was given, that contained 3.2 ml of Inj. BUPIVACAINE (heavy) and 30 mcg of Inj. CLONIDINE. The surgery was successfully completed by fixing a 6 x 11 cm prolene mesh and the wound was closed in layers aseptically. After shifting to ICU, he was given with Inj. Ceftriaxone, inj. Pantoprazole and T. Amlodipine besylate. His post operative recovery was uneventful.



Figure 2: Injecting spinal anaesthesia
Source: Vivekanandha Medical Care Hospital



Figure 2: Spinal anaesthesia
Source: Vivekanandha Medical Care Hospital

Clonidine which belongs to the class of alpha-2 adrenergic agonist, induces analgesia by depressing the release of C-fibre transmitters and by hyperpolarization of post synaptic dorsal horn neurons. Motor block may be prolonged due to the binding of clonidine to motor neurons in the dorsal horn. Blood pressure is affected in a complex manner after neuraxial or systemic administration of clonidine. It produces hypotension by activation of post synaptic alpha 2 adrenoreceptors in the brain stem and by directly inhibiting the sympathetic presynaptic alpha 2 adrenoreceptors neurons in the spinal cord^[3].

In a systemic review, a 20% incidence of hypotension in controls and 31.3% incidence (relative risk, 1.81; 95% confidence intervals: 1.44-2.28) in patients receiving clonidine 15-150µg without evidence of dose responsiveness^[4]. Some authors have argued that when large dose of local anesthetic is used it masks the hypotensive effect of clonidine^[5] and when comparative large doses of clonidine is used with small doses of local anesthetic the hypotensive effect is revealed^[6]. In a study, when clonidine 30 µg was given as adjuvant to bupivacaine during transurethral resection of prostate or bladder tumor in patients hemodynamic stability was well maintained^[2].

Intravenous clonidine administered upto 60min after spinal block prolongs bupivacaine spinal anaesthesia. A significant time period may be taken to fix long-acting local anaesthetic. The levels of spinal anaesthesia with hyperbaric bupivacaine can be altered upto 60min after injection. Thus, intravenous clonidine is thought to be able to prolong spinal anaesthesia depending on the bupivacaine fixation time during this period.^[7]

CONCLUSION

The patient in this study was given with 3.2 ml of bupivacaine along with 30 mcg of clonidine as spinal anaesthesia during the hernioplasty procedure. This combination proved beneficial in maintaining systolic blood pressure and thus providing prolonged anaesthesia throughout the surgical procedure. Hence the use of this combination induces better sedation, analgesia, increased cardio vascular stability and improved therapeutic outcome both during and after the surgery.

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