International Journal of Medicine Research
www.medicinesjournal.com
ISSN: 2455-7404
Received: 13-06-2022, Accepted: 28-06-2022, Published: 15-07-2022
Volume 7, Issue 2, 2022, Page No. 13-19

A comparison of epidural levobupivacaine 0.5% with racemic bupine 0.5 % for lower abdominal surgery

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Abstract
- Racemic bupivacaine has been widely used as a local anesthetic because of its long duration of action and beneficial ratio of sensory to motor block when used for epidural analgesia.
- However, there have been reports of death attributable to bupivacaine-induced cardio toxicity in patients after accidental intravascular injection.

Keywords: Levobupivacaine Bupivacaine Cardiotoxic Epidural Analgesia

Introduction

Levobupivacaine

The isolated S (-) isomer of bupivacaine,
- Has been shown to be less cardiotoxic than bupivacaine in preclinical studies.
- Initial studies with levobupivacaine are now appearing in the literature confirming its equivalent clinical efficacy with racemic bupivacaine.

Objective of the study

- We compared the clinical efficacy (onset, duration, and intraoperative conditions) and tolerability of 0.5% levobupivacaine with that of 0.5% bupivacaine in patients undergoing elective lower abdominal surgery with epidural anesthesia.

Methodology

- 60 patients, belonging to ASA grade I or II, aged between 18 to 60 years, undergoing elective lower abdominal surgeries were randomly selected (chit method).
- Informed consent was be taken.
- The study population was randomly divided into two groups with 30 patients in each group.
- Study group L -would receive 0.5% levobupivacaine
- Study group R -would receive 0.5% racemic bupivacaine
- Total Drug Given
- 17 ml of 0.5% levobupivacaine or 0.5% bupivacaine

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Inclusion criteria

- Age group of 18-60 years of both sexes.
- ASA grade I or II.
- Patients coming for elective surgeries.
- Patients with SBP: 100-139 mm of Hg.
- Patients with DBP: 60-89 mm of Hg.

Exclusion Criteria

- Patient refusal.
- ASA grade III and IV.
- Patients with infection at site of injection.
- Patient with coagulopathy.
- Patients on anti-coagulation treatment (INR >1.5).
- Patients with congenital abnormalities of lower spine and meninges.
- Patients with history of severe renal, hepatic, respiratory, or cardiac disease or a neurological, neuromuscular, or psychiatric condition.

- Patients with history of allergy to local anaesthetics.
- Patients with uncontrolled systemic illness like diabetes mellitus, hypertension etc.
- Patients with uncorrected hypovolemia.
- Patients posted for lower segment caesarean section

Procedure

- Anaesthetic evaluation on the previous day of surgery
- Drug and equipments necessary for resuscitation and general anaesthesia were kept ready
- IV line was secured using 18G cannula and infusion started. Base line blood pressure, heart rate and respiratory rate was noted.
- The patient was placed in left lateral position
- Once the epidural space was confirmed
- 3ml of 2% Lignocaine with adrenaline 1:200000 was given as a test dose.
- Following which the study drug was given.

Parameters Monitored

- Onset of sensory block
- Degree of motor blockade – using Modified Bromage scale
- Duration of analgesia
- Haemodynamic changes- heart rate, blood pressure, mean arterial pressure and respiratory rate
- Intra operative and post-operative complications if any – such as nausea, vomiting, hypotension, bradycardia, respiratory depression was looked for, recorded and treated accordingly.

Statistical Methods

- Qualitative data will be analyzed by chi-square test.
- Quantitative data will be analyzed by student "t" test.

Results

Onset of Sensory Block

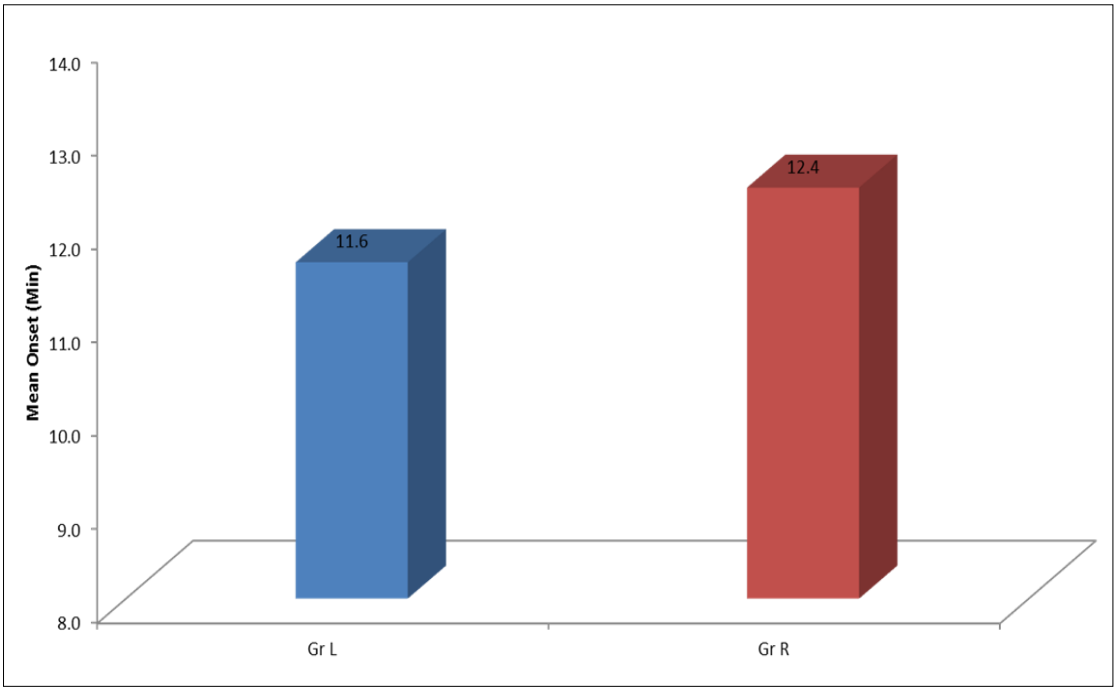

Fig 1

Table 1

Group L	Group R
11.6	12.4

Table 2

Group L	Group R
19.8	15.8

Onset of Motor Block

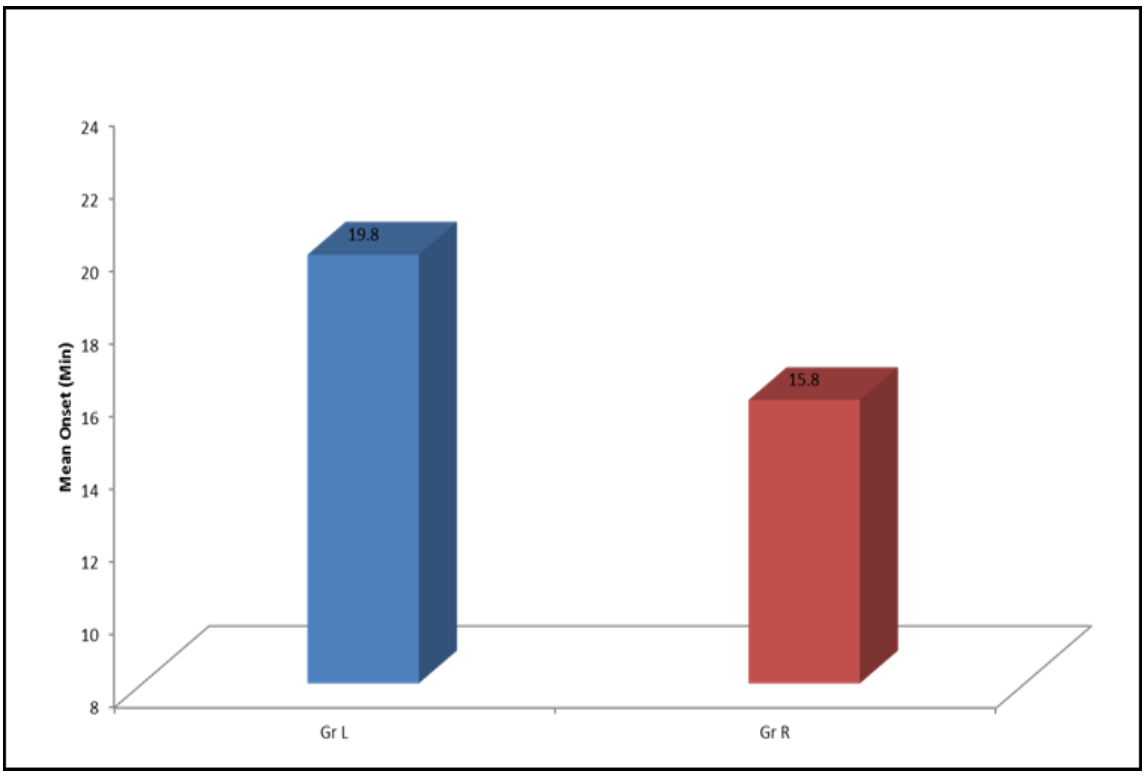

Fig 2

Table 3

	Group L	Group R
T6	63.3	60.0
T7	30.0	30.0
T10	6.7	10.0

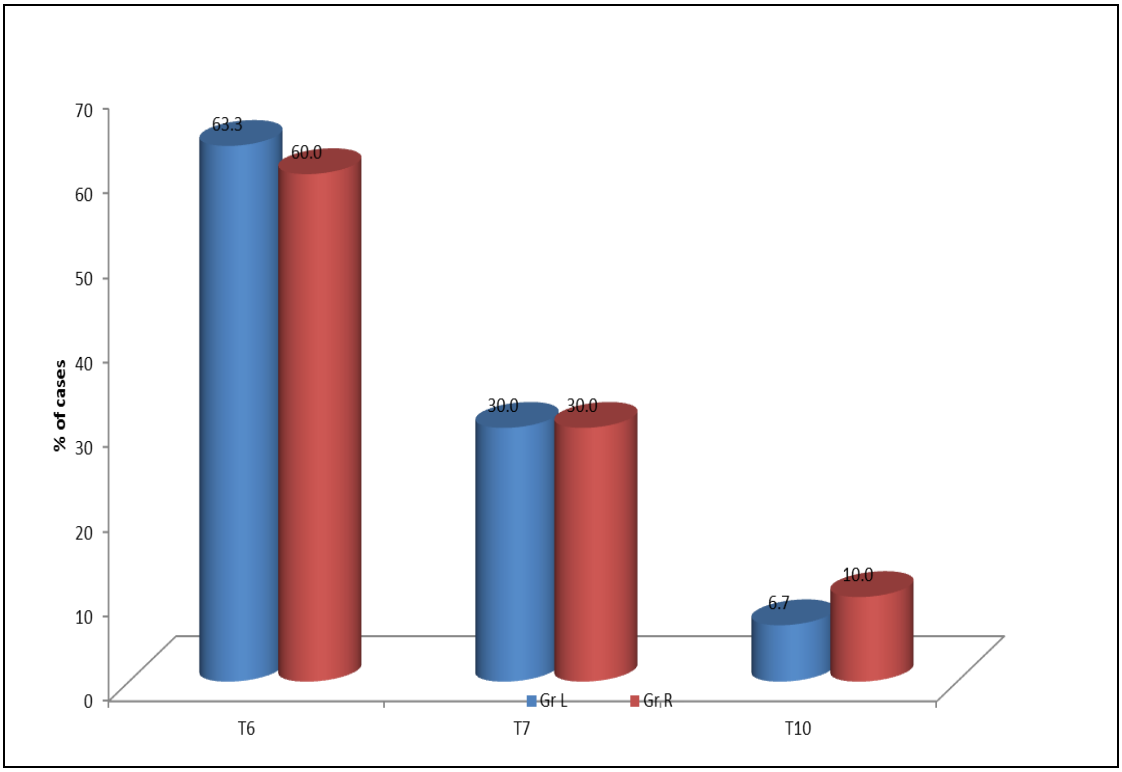

Fig 3: Highest Level of Sensory Block

Degree of Motor Blockade

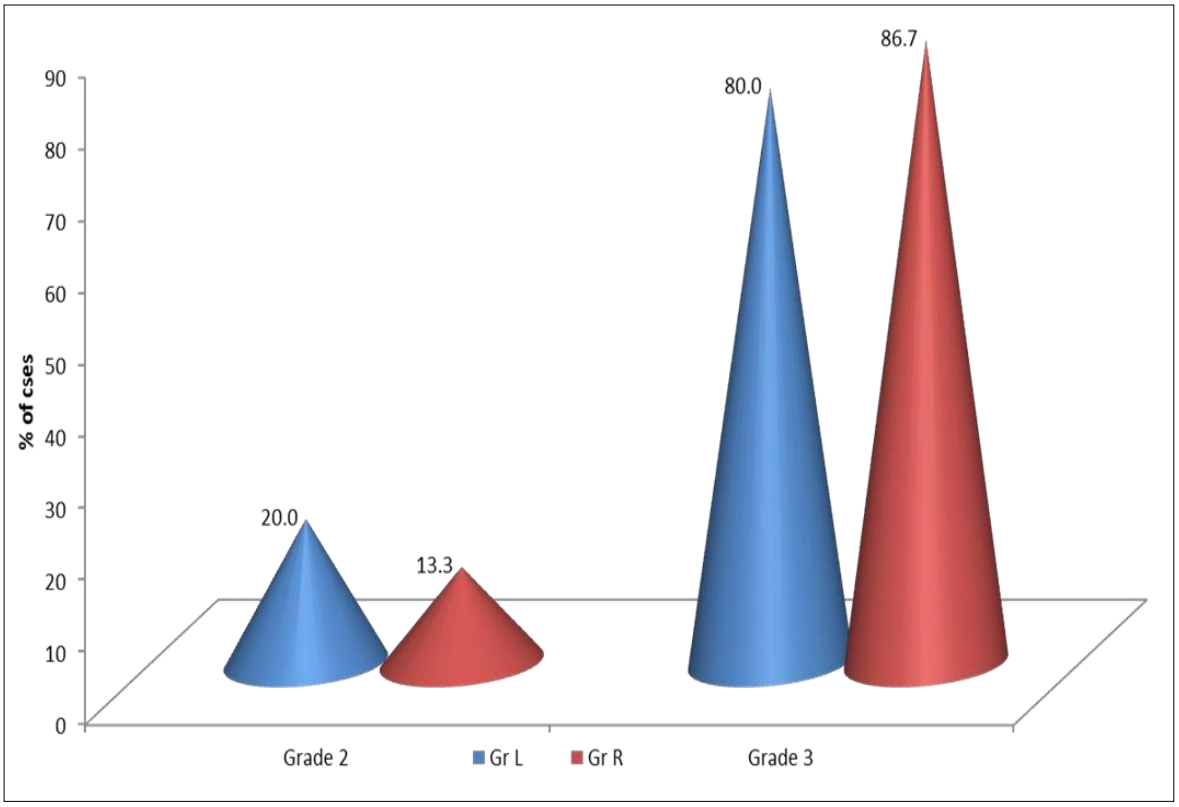

Fig 4

Table 4

Group L	Group R
286.6	281.6

Duration of motor block

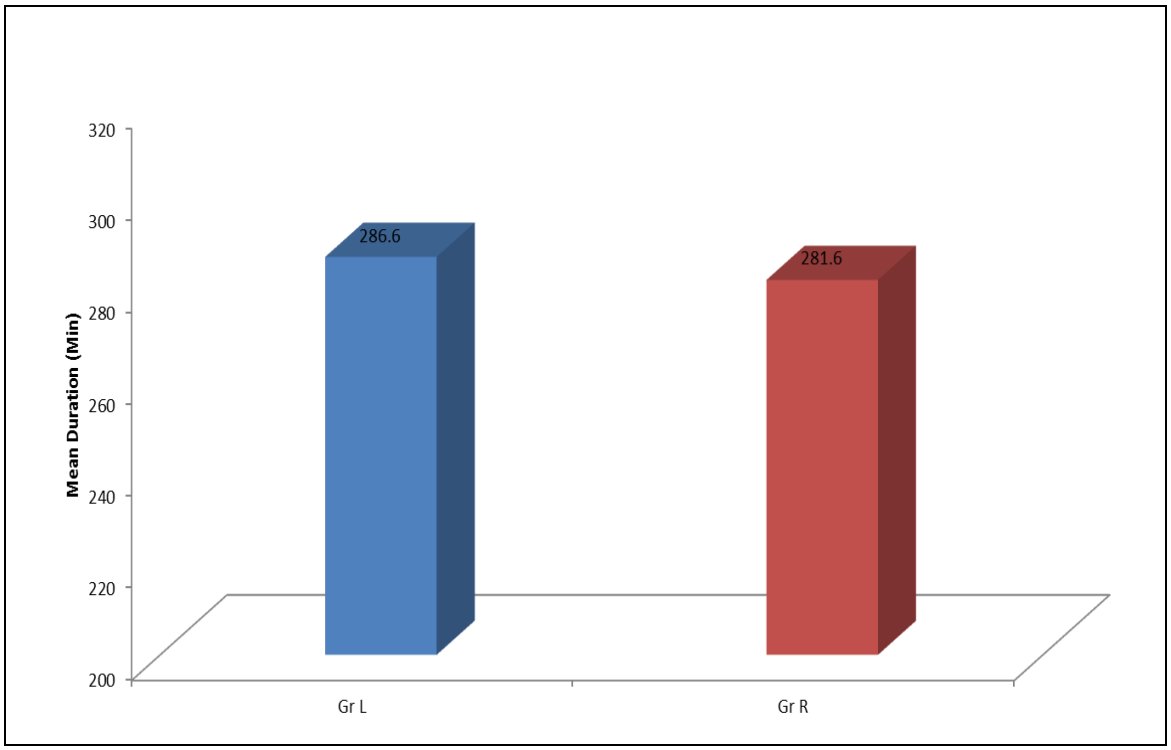

Fig 5

Table 5

Group L	Group R
417.7	394.7

Duration of Sensory Analgesia

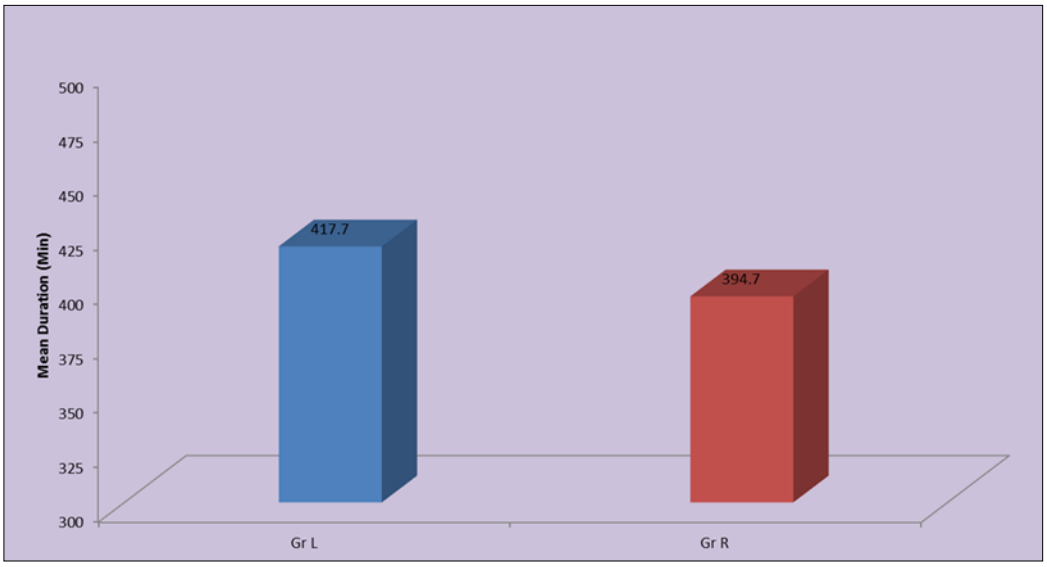

Fig 6

Hemodynamics

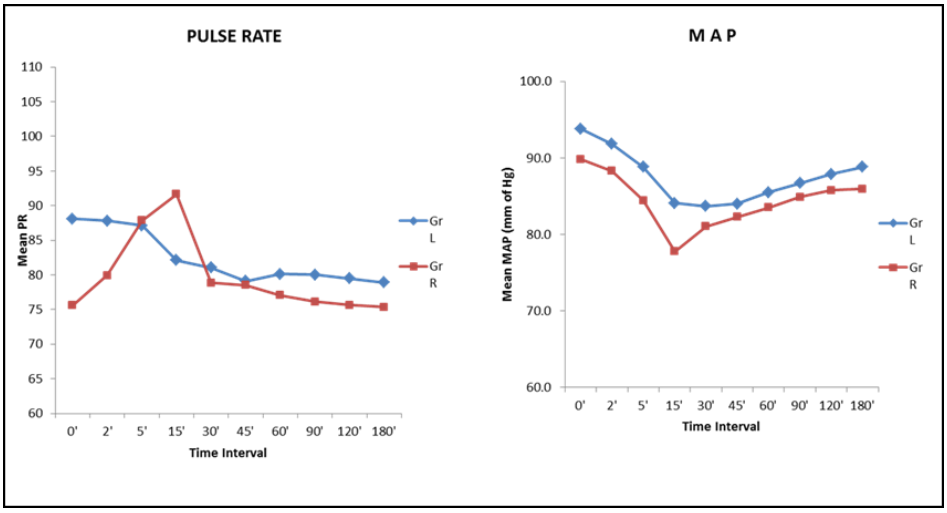

Fig 7

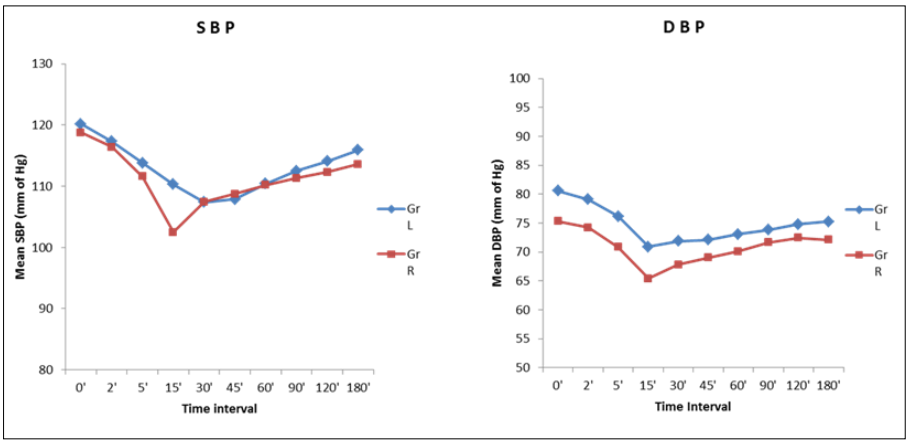

Fig 8

Table 6

	Group L	Group R
Nausea	3.3	6.7
Vomiting	0.0	3.3
Hypotension	6.7	10.0

Side Effects

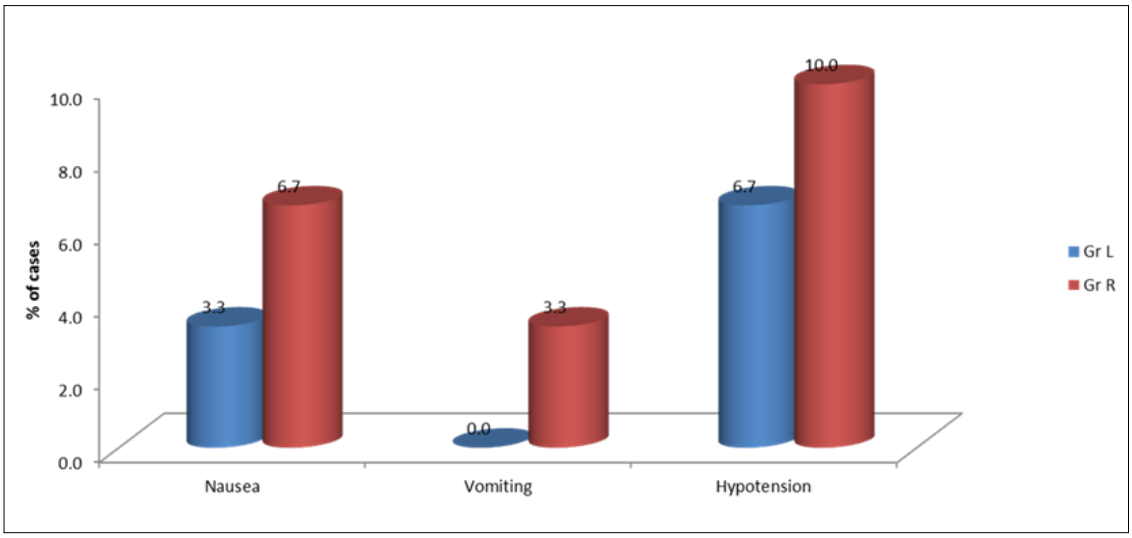

Fig 9

Discussion

- This study demonstrates that 0.5% levobupivacaine is a suitable anesthetic for use in lower abdominal surgery.
- Levobupivacaine provided

1. Adequate sensory block
2. Equivalent efficacy for the time taken to reach sensory block
3. The sensory block is substantially longer than the motor block.

- In the our study, levobupivacaine and bupivacaine both showed excellent sensory/motor separation.
- As expected, a decrease in systolic blood pressure, attributable to sympathetic block accompanying the epidural anesthesia, was the most common.

CVS and CNS toxicity

- Preclinical studies have shown that levobupivacaine has a reduced potential to cause cardiotoxic effects.
- The mild CNS symptoms developed at a larger dose level of levobupivacaine (56.1 mg) than with racemic bupivacaine (47.9 mg) when given intravenous.

Conclusion

- Levobupivacaine is being developed as a local anesthetic with a similar pharmacodynamic profile to racemic bupivacaine;
- The current study also demonstrates that 0.5% levobupivacaine provides sensory and motor block that is adequate for lower abdominal surgery; which is comparable to that achieved with the same volume and concentration of bupivacaine.

- **However, with less risk of systemic toxicity**
- (Which is desirable when using large dose of drug as in epidural anaesthesia.)

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