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A routine observational study to evaluate the analgesic efficacy of epidural 0.2% ropivacaine in postoperative pain relief

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Abstract
Aim: To evaluate the analgesic efficacy of Epidural ropivacaine 0.2% in postoperative pain relief.
Method: A routine data based observational study involved 50 patients of ASA1, ASA2 who received Epidural 0.2% Ropivacaine and 50 patients who received Epidural 0.125% bupivacaine postoperatively. All patients were monitored for postoperative pain by the visual analogy scale (VAS), requirement of rescue analgesia, hemodynamic parameters and adverse effects.
Results: Postoperative Pain scores, Incidence of hypotension and delayed motor block were comparable between the observational groups.
Conclusion: Ropivacaine 0.2% and bupivacaine 0.125% were equally efficient in rescue analgesic requirement, but ropivacaine had a better safety profile in terms of less hypotension and lesser motor block.

Keywords: Bupivacaine, epidural, ropivacaine, postoperative pain

Introduction
Effective pain control is essential for the optimum care of patients in the intraoperative and postoperative period. Epidural anesthesia is a safe and inexpensive technique with the advantage of providing surgical anesthesia and prolonged postoperative pain relief. Effective pain management is a critical component of postoperative care and contributes to fewer postoperative complications. The current trend in postoperative pain is multimodal analgesia. Epidural opioids have been used, but the associated major side effects, such as sedation, itching, urinary retention, nausea, vomiting, and respiratory depression have limited its widespread use. Epidural analgesia can be delivered as intermittent bolus doses, continuous infusion, and patient controlled infusion. Bupivacaine has been used successfully for many years for this purpose, in concentrations ranging from 0.0625% to 0.25%.Cardiac system and central nervous system (CNS) adverse effects related to bupivacaine have led to development of relatively safer drugs such as ropivacaine and levobupivacaine. Ropivacaine is a newer long-acting amide-linked local anaesthetic agent. It is a pure Senantiomer of propivacaine with greater differentiation between sensory and motor blocks and with a better margin of safety due to reduced toxic potential. This study is aimed at evaluating analgesic efficacy of 0.2% ropivacaine Epidural.

Materials and Methods
After obtaining written informed consent, a routine data based observational study was conducted which involved 50 patients of ASA1, ASA2 who received Epidural 0.2% Ropivacaine and 50 patients who received Epidural 0.125%bupivacaine postoperatively. All patients were monitored for postoperative pain by the visual analogy scale (VAS), requirement of rescue analgesia, hemodynamic parameters and adverse effects.

Inclusion Criteria
Patients of ASA grades I to II of both Sexes

Exclusion Criteria
Patients having severe cardiorespiratory illness, coagulation disorders, chronic liver disease, chronic kidney disease, infection at the local site, and with allergies, to amide, local anaesthetics were excluded from the study.

All patients were preoperatively assessed as per standard ASA guidelines/ASRA guidelines with routine laboratory blood investigations, chest X-ray, 12-lead electrocardiogram (ECG) expert specialist consultation for indicated patients. Patients were kept fasting for 8 hours for solids

Monitoring

Standard ASA monitors were used. All patients were continuously monitored for Heart rate (HR), Respiratory rate (RR), and oxygen saturation, Non-invasive blood pressure and ECG.

On the day of surgery, IV access was secured with two wide bore cannulae, Patients were preloaded with crystalloids prior to spinal anaesthesia. All patients received combined spinal-epidural anaesthesia under all aseptic precautions, in L3–4, L4-5 space. Epidural catheter was placed under strict asepsis by loss of resistance to air technique, hanging drop test and by meniscal level fall test in epidural catheter. Postoperatively epidural infusion was started with 0.2%ropivacaine 4-5 ml/hr and was titrated according to patients pain score. Rescue analgesia was given with IV paracetamol. Visual analog scale (VAS) pain scores were assessed and recorded every 4 hourly.

Other related adverse effects such as hypotension and delayed motor recovery were also recorded. Hypotension was managed by fluid bolus and injection me phentermine 6 mg boluses if required. Requirement of rescue analgesia (IV paracetamol/opioids) was also noted.

Statistical analysis

Unpaired t-test for comparison between two groups (for comparison of means between two groups, numerical data which are normally distributed).Mann–Whitney U-test for comparison between two groups (for comparison of means between two groups, numerical data which are not normally distributed).

Chi-square test (for comparison of proportions between two groups, categorical data).

Results

Table 1: Demographic data

Parameters	Bupivacaine 0.125%	Ropivacaine 0.2%	P value
Mean age (years) ± SD	62.24±8.28	62.12±8.34	0.94
Sex Male female	15 (70%) 35 (30%)	14 (69%) 36 (31%)	0.895

Table 2: Visual analogy score

	Bupivacaine 0.125%	Ropivacaine 0.2%	P value
Day 0	3.33	3.6	0.114
Day 1	2.11	2.32	0.075

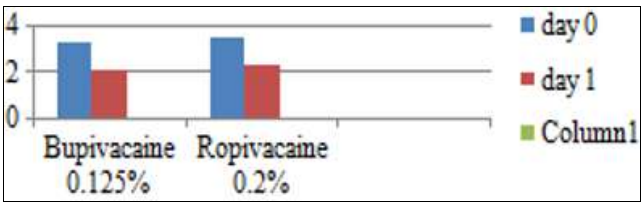

Fig 1: Requirement of rescue analgesia

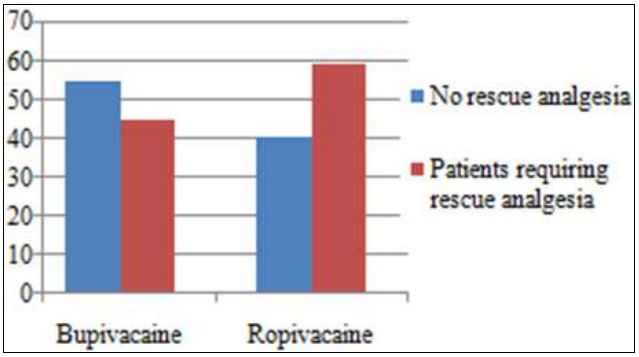

Fig 2: Requirement of rescue analgesia

Table 3: Requirement of rescue analgesia

	Bupivacaine 0.125%	Ropivacaine 0.2%
Patients not requiring rescue analgesia	55.1%	40.5%
Patients requiring rescue analgesia	44.9%	59.5%

Table 4: Incidence of hypotension, delayed motor block was much less with 0.2% Ropivacaine

Adverse effect	Bupivacaine 0.125%	Ropivacaine 0.2%	P value
hypotension	5(9.8%)	1(2.3%)	0.025
Delayed motor block	4(7.3%)	1(2.3%)	0.046

Discussion

Optimum pain management should start before surgery. All patients should undergo a preoperative assessment that includes a section on pain management. This allows planning of optimal pain management techniques and facilitates early discussions to help alleviate fear of postoperative pain. Discussion of postoperative pain management at preoperative assessment aims to optimize patient satisfaction and reduce adverse effects. Effective pain management is underpinned by assessment and timely response. Self-reporting subjective pain scales represent the standard of acute pain assessment, allowing patients to report pain using a unidimensional scale of numbers or words. Commonly used to evaluate pain intensity, the visual analogue scale, verbal rating scale and numerical rating scale are valid, reliable and appropriate for use in monitoring postoperative pain in patients who are able to self-report. Our study emphasises on epidural analgesia for postoperative pain relief. Postoperative epidural analgesia is usually administered via a continuous infusion to maintain a level of analgesia and to minimize the cardiovascular and respiratory effects of bolus doses of local anaesthetics and opioid respectively. We have compared the rescue analgesic requirement while using 0.2% ropivacaine when compared to 0.125% bupivacaine. Epidural analgesia can be delivered as intermittent bolus doses, continuous infusion, and patient controlled infusion. Bupivacaine has been used successfully for many years for this purpose, in concentrations ranging from 0.0625% to 0.25%. Cardiac system and central nervous system (CNS) adverse effects related to bupivacaine have led to development of relatively safer drugs such as ropivacaine and levobupivacaine. Ropivacaine is a newer long-acting amide-linked local anaesthetic agent. It is a pure S enantiomer of propivacaine with greater differentiation between sensory and motor blocks and with a better margin of safety due to reduced toxic potential

Conclusion

Ropivacaine 0.2% and bupivacaine 0.125% were equally efficacious in terms of VAS pain scores, rescue analgesic requirement, but ropivacaine had a better safety profile in terms of less hypotension and lesser motor block

Conflict of Interest

Not available

Financial Support

Not available

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