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Comparison of postoperative analgesic efficacy of epidural ropivacaine and ropivacaine with tramadol in adults undergoing abdominal surgeries under general anaesthesia

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Abstract
Objectives: This prospective study was conducted to compare the postoperative analgesic efficacy of epidural 0.2% Ropivacaine and 0.2% Ropivacaine with Tramadol in patients undergoing abdominal surgeries under general anesthesia.
Observations:

- The duration of analgesia in postoperative period in patients who received epidural 0.2% Ropivacaine with Tramadol was comparatively longer than that of patients who received epidural 0.2% Ropivacaine.
- The Ramsay sedation score was observed to be more in patients who received epidural 0.2% Ropivacaine with Tramadol compared to patients who received epidural 0.2% Ropivacaine.
- There was no significant difference in the postoperative nausea and vomiting episodes in both the groups.
- There was no significant difference in occurrence of pruritus in both the groups.
- There was no statistical difference between the two groups with respect to heart rate, mean arterial pressure, oxygen saturation and respiratory rate.

Keywords: Postoperative analgesia, ropivacaine, tramadol, epidural

Introduction
One of the most commonly practiced and efficient method for providing postoperative analgesia in case of abdominal surgeries is regional analgesia with local anaesthetic drugs and other adjuvants via the epidural catheter.
By providing epidural analgesia, patient has adequate pain relief. This helps in abolishing the restriction of movement of the diaphragm.
Hence, effective epidural analgesia will enable a patient to take deep breaths, make efficient cough efforts and move with ease. This in turn helps in a enhanced early recovery with a reduction in co-morbidities like chest infections and deep vein thrombosis. Tramadol when given via epidural route causes prolongation of the postoperative analgesia duration, exhibits reducedpain scores and good sedation scores with lack of respiratory depressant effect. It has been used and being studied as an adjuvant to epidural local anesthetic drugs for effective postoperative analgesia. This study is proposed for comparing the postoperative analgesic efficacy of epidural Ropivacaine and epidural Ropivacaine with Tramadol in adult patients who undergo abdominal surgeries under general anesthesia.

Aims and objectives
The aim of the study is to compare the postoperative analgesic efficacy of epidural Ropivacaine and Ropivacaine with Tramadol in adults undergoing abdominal surgeries under general anesthesia.

Objective
To compare the duration of postoperative analgesia

- Duration of Analgesia: The duration of analgesia is defined as the time period between epidural drug administration and perception of pain indicated by visual analogue pain score 4.

Materials and methodology

The study was a prospective non-randomized, double arm, single blind, controlled study. The study was conducted in patients scheduled for abdominal surgeries done under general anesthesia at Dhanalakshmi Srinivasan Medical College Hospital after obtaining written informed consent.

Inclusion criteria

1) Patients undergoing elective abdominal surgeries under general anesthesia.
2) Age between 30 to 60 years
3) Males and females
4) ASA class I and II
5) Patients who have given valid informed consent
6) Duration of surgery less than 3 hours.

Exclusion criteria

1) Patients not satisfying inclusion criteria.
2) Patients with an allergy or sensitivity to opioid group of drugs and local anesthetics.
3) Patients with spinal deformities
4) Any contraindication to epidural anesthesia
5) Patients with neurological disorders

Methodology

Patients who satisfied the above mentioned inclusion criteria selected were counseled about the risks and benefits involved in the study. After getting consent, patients who were willing to be included in the study were enrolled and analyzed. A total of 60 patients were included in the study. Patients were divided into two groups of 30 in each into group R and group RT.

Patients were preoperatively evaluated, clinically examined and proper investigations done prior to the assessment. Procedures were explained in detail and written consent was obtained. Inj. Metoclopramide hydrochloride 10mg IM and Inj. Ranitidine hydrochloride 50mg IV was given half an hour prior to the surgery. Patient was then shifted inside the operation theatre. Routine monitoring included Electrocardiography, Pulse Oximetry, Non invasive blood pressure and respiratory rate monitoring. Intravenous cannulation done with 18G venflon.

Patient was made to lie in right lateral position. Under sterile aseptic precautions, at the level of L1-L2 intervertebral space, after subcutaneous infiltration of 2ml of 2% lignocaine, using 18G epidural needle, epidural space was identified by loss of resistance technique, and 20 G catheter was threaded in via the needle.

After ensuring that blood or cerebrospinal fluid was not aspirated via catheter, 3ml of 1.5% lignocaine with adrenaline (1:2,00,000) dilution was administered as test dose via the catheter.

Patient was then made to lie in supine position. Premedicated with Inj.Glycopyrrolate 5 micrograms/kg IV, Inj.Midazolam 0.01mg/kg IV, Inj.Fentanyl Citrate 2micrograms/kg IV. Preoxygenated with 100% oxygen for at least 3 minutes under closed circuit. Then induced with Inj.Propofol 2mg/kg and Atracurium Besilate 0.5mg/kg administered via intravenous route. Intubated with endotracheal tube of appropriate size for the patient, cuff inflated with optimal volume of air, bilateral equal air entry checked and secured in a proper manner. Maintenance was with nitrous oxide and oxygen in the ratio of 2:1 and Sevoflurane 1-2%. Intravenous Fentanyl Citrate 20 micrograms given hourly and supplemental doses of Inj.Atracurium Besilate 10 mg given every 30 minutes intraoperatively.

At the time of closure of skin layer of the incisional wound, the epidural drug was given according to the group the patient belongs to. The total volume of drug in either group was 10ml. The patients in Group R received 0.2% Ropivacaine and the patients in Group RT received 0.2% Ropivacaine with Tramadol (1mg/kg) epidurally.

Inj. Ondansetron 4mg given intravenously 30 minutes before extubation in both groups. At the end of surgery, patient was extubated after reversal of neuromuscular blockade with Inj. Neostigmine (50 micrograms /kg) and Glycopyrrolate (10 micrograms /kg) and shifted to postanaesthesia care unit.

The Visual analogue pain scale score, heart rate, blood pressure, respiratory rate, oxygen saturation were monitored every 15min for the first two hours and hourly up to 12 hours. The duration of analgesia, Ramsay sedation score, episodes of nausea and vomiting and occurrence of pruritus were observed. IV Paracetamol (15mg/kg) was given as rescue analgesia.

Observations and results

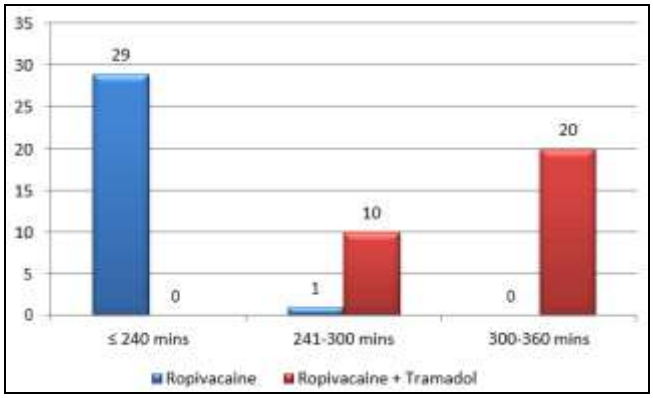

Fig 1: Duration of Postoperative Analgesia

Duration of Postoperative Analgesia	Ropivacaine	%	Ropivacaine with Tramadol	%
≤ 240 mins	29	96.67	0	0.00
241-300 mins	1	3.33	10	33.33
300-360 mins	0	0.00	20	66.67
Total	30	100	30	100

Duration of Postoperative Analgesia	Ropivacaine	Ropivacaine with Tramadol
N	30	30
Mean	220.57	309.90
SD	14.42	19.26
P value Unpaired t Test		<0.0001

The association between the intervention groups and duration of postoperative analgesia among study subjects is considered to be statistically significant since $p< 0.05$. In patients belonging to Ropivacaine group, majority of the study subjects belonged to ≤ 240 minutes duration of postoperative analgesia class interval (n=29, 96.67%) with a mean duration of postoperative analgesia of 220.57 minutes. In the Ropivacaine with Tramadol group majority belonged to 300-360 minutes duration of postoperative analgesia class

interval (n=20, 66.67%) with a mean duration of postoperative analgesia of 309.90 minutes.

The increased mean duration of postoperative analgesia in Ropivacaine with Tramadol group compared to the Ropivacaine group is statistically significant as the p value is <0.0001 as per unpaired t-test.

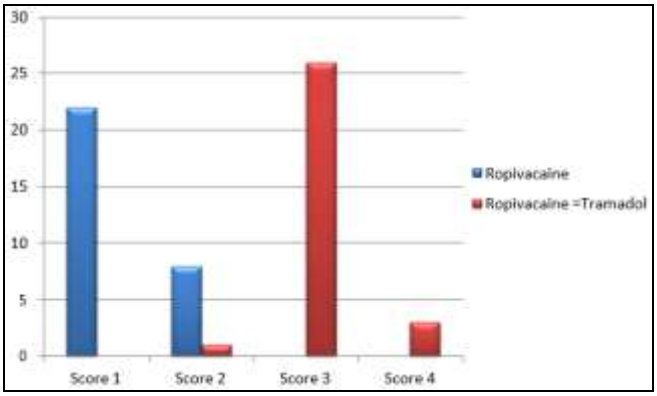

Fig 2: Ramsay sedation score

Ramsay sedation score	Ropivacaine	%	Ropivacaine with Tramadol	%
1	22	73.33	0	0.00
2	8	26.67	1	3.33
3	0	0.00	26	86.67
4	0	0.00	3	10
Total	30	100	30	100

Ramsay sedation score	Ropivacaine	Ropivacaine with Tramadol
N	30	30
Mean	1.26	3.06
Standard Deviation	0.44	0.128
P value unpaired t test		<0.0001

The association between the intervention groups and Ramsay sedation score among study subjects is considered to be statistically significant since $p<$ 0.05. In patients belonging to Ropivacaine group, majority of the study subjects belonged to RSS 1 class interval (n=22, 73.33%) with a mean RSS of 1.26 scoring points. In the Ropivacaine with Tramadol group majority belonged to RSS 3 class interval (n=26, 86.67%) with a mean RSS of 3.06 scoring points. The increased mean Ramsay sedation score in Ropivacaine with Tramadol group compared to the Ropivacaine group is statistically significant as the p value is <0.0001 as per unpaired t-test.

Conclusion

From my study, I conclude that the addition of 1 mg/kg of Tramadol improves the postoperative analgesic efficacy of epidural 0.2% Ropivacaine by prolonging the duration of analgesia and providing good sedation with no significant hemodynamic alterations, nausea, vomiting and pruritus.

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