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The Effect of Tramadol, Fentanyl and Combination of Both as Adjuvants to Epidural Ropivacaine for Postoperative Analgesia in Lower Abdominal Surgery More Than 90 Minutes

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I. Introduction

Tramadol and fentanyl both have analgesic and sedative properties when used as adjuvant in regional anaesthesia. Analgesic and anaesthetic requirement get reduced by use of these adjuvant. They have stable hemodynamics and enhanced sympathoadrenal stability. Pain relief is essential for optimal control of patients in the intraoperative and post operative period. Epidural technique has opened a new horizon in modern anaesthesia for pain relief. Benefits of good quality epidural analgesia include- early ambulation, faster postoperative anaesthetic recovery, better post operative analgesia ,earlier return of bowel function, decreased incidence of thromboembolic phenomenon. Epidural ropivacaine & opioid derivative combination has better perioperative analgesia than intravenous patient controlled analgesia.

Fentanyl is a potent lipid soluble synthetic μ-opioid agonist, with a rapid onset and short duration of action.Tramadol is a weak opioid analgesic with atypical profile. Ropivacaine is a long-acting amide local anaesthetic agent and first produced as a pure enantiomer. It produces effects similar to other local anaesthetics via reversible inhibition of sodium ion influx in nerve fibres. Ropivacaine is less lipophilic than bupivacaine and is less likely to penetrate large myelinated motor fibres, resulting in a relatively reduced motor blockade. This study compare the effect of epidural tramadol, fentanyl and combination of both along with ropivacaine on post operative analgesia in patients who underwent abdominal surgery for more than 90 minutes.

II. Methodology

This study was undertaken in 120 patients who underwent abdominal surgery of 90 minutes duration in Rajasthan University Of Health Sciences Hospital and College, Jaipur in the department of Anaesthesiology.

1) Selection criteria
✓ Age group 21-50
✓ Sex- male/female
✓ ASA status I & II
✓ Patients posted for lower abdominal surgery of duration mor than 90minutes
2) Exclusion criterion
▸ Patients with haematological disease
▸ Bleeding or coagulation test abnormalities,
▸ Psychiatric diseases
▸ Diabetes, hypertension, IHD
▸ Impaired renal or hepatic function
▸ History of drug abuse
▸ Allergy to local anaesthetics of the amide type
▸ Local sepsis or deformity of spinal lumbar region.

After pre anaesthetic check up with all routine investigations an informed consent was obtained in each case. Patient' s base line blood pressure, pulse rate were recorded & an intravenous line was secured with 18 G cannula. After placing patient in sitting position an epidural puncture was started with 16-18 G Tuohy' s needle through L_3-L_4 interspinous space while maintaining all the aseptic precaution Epidural space was identified by a negative aspiration test and loss of resistance technique which was confirmed by injecting 3ml test drug, ruling out accidental subaracnoid tap or intravascular injection. Afterwards drug was injected slowly in incremental dosing. Patients were randomly divided into four groups: (n=30) :-

1. Group R-Ropivacaine .75% 17 ml + 1.5ml saline ,
2. Group RT-Ropivacaine .75% 17 ml + 50mg tramadol (1ml) and .5 ml of saline,

3. Group RF-Ropivacaine .75% 17 ml + 50µg of fentanyl (.5ml) and 1 ml of saline ,
4. Group RFT- Ropivacaine .75% 17 ml + 50mg tramadol (1ml)+ and 50µg of fentanyl (.5ml) .

This is a Prospective, Randomized, Double blind study. Statistical analysis was done using SPSS Software. Non Parametric Analysis of Variation (ANOVA) was used for comparison between the 4 groups. P value <0.05 was considered statistically significant. Data are presented as Mean value ± SD and percentage as indicated.

Observation

Study was undertaken in 120 patients who underwent abdominal surgery of 90 minutes duration in epidural anaesthesia. In this parameters studied were

Primary Outcome: Duration of Analgesia
Secondary Outcomes:
1. Duration of Sensory Block (2 segment regression time).
2. Duration of Motor block (Bromage IV to II).
3. Hemodynamic Changes.
4. Incidence of Sedation.
5. Side effects, if any.

III. Result:

There was no significant difference in demographic characteristics between the groups.(Table 1) Duration of Analgesia was significantly higher in group RT (250.0±20.29 min), RF (201.11 ± 11.13 min) and RFT (432.52±87.12 min) as compared to group R (120±15.01 min). Also the Group RFT recorded significantly higher Duration of Analgesia compared to Group RT or RF.(Diagram 1).

The mean Duration of Sensory Blockade was significantly longer in group RT, RF and RFT than group R. Total Duration of Motor Blockade was significantly longer in the group RFT than in R, RT and RF. (Table 2).100% of patients in Group RFT, 77.6% in RT and 21.5% in RF were found to be sedated.

Hemodynamicaly, there was no significant difference in the incidence of hypotension or bradycardia among the 4 groups. There was no difference in occurrence of side effects such as nausea & vomiting, pruritis, respiratory depression and headache among the groups.

IV. Discussion

Patients undergoing lower abdominal surgery has a definitive advantage of pain relief analgesia for long term with epidural technique. Drugs use in this technique can be used in combination for prolongation of analgesia as well as providing stable hemodynamics.

(Table 1)

Parameters	Group R	Group RT	**Group RF**	**Group RFT**	P VALUE
Age in years (mean ±SD & range)	33.13±11.22 (20-50)	35.67±11.17 (20-50)	34.57±11.14 (20-50)	33.93±11.20 (20-50)	>.5
Weight in kg (mean ±SD & range)	54.47±7.46 (40-68)	55.27±7.87 (40-68)	53.77±7.17 (40-68)	54.98±7.76 (40-68)	>.5
Sex : Male	11(36.67%)	13 (43.33%)	12 (40.00%)	11(36.67%)	
Female	19 (63.33%)	17 (56.67%)	18 (60.00%)	19 (63.33%)	
ASA: 1	22 (73.33%)	24 (80%)	23 (76.66%)	24 (80%)	
2	8 (26.67%)	6 (20%)	7 (23.33%)	6 (20%)	

Diagram 1

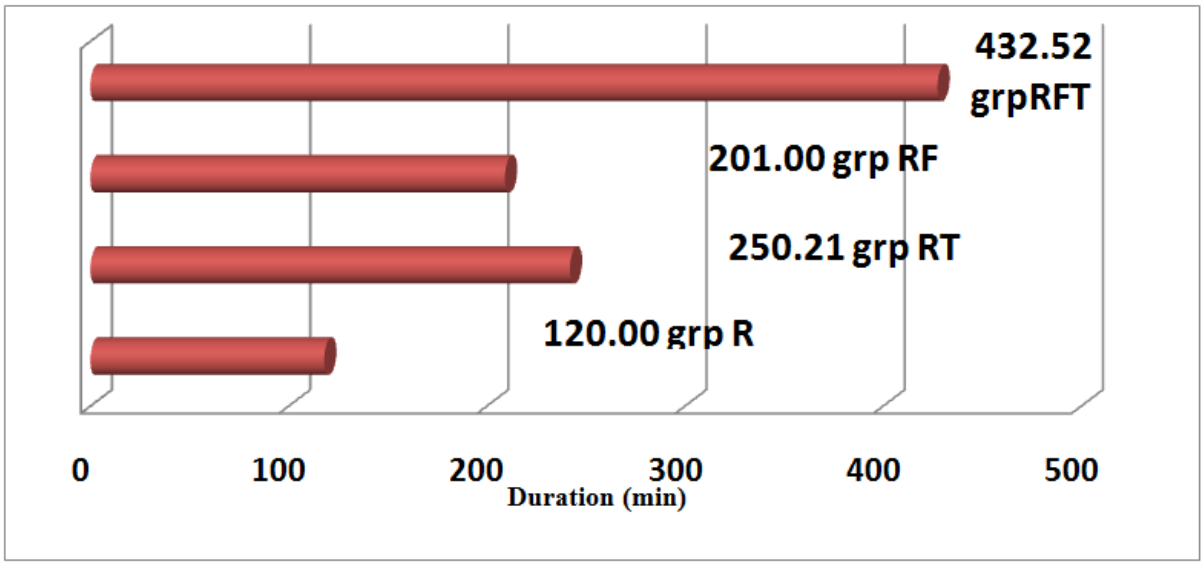

Table 2

Groups	Group R	Group RT	Group RF	Group RFT
Duration Of Analgesia (MIN)	120±15.01	250.0±20.29	201.11±11.13	432.52±87.12
Duration Of Sensory Block (MIN)	90.17±13.01	140.17±22.41	131.98±19.67	144.34±40.5
Duration Of Motor Block (MIN)	30.11±9.01	44.32±14.55	40.00±12.44	67.22±6.11

In our study it was concluded that combination of ropivacine with fentanyl and tramadol prolongs analgesia in comparison to R, RF, RFT group with stable hemodynamic status. It was also found that sedation achieved by RFT group was more than R, RF, RT.

V. Conclusion

Our study has demonstrated that addition of a combination 50mg of tramadol and 30 µg of fentanyl to .75% ropivacaine in epidural administration significantly prolongs the duration of analgesia in post operative period, without any significant effect on hemodynamic status or any occurrence of side effects.

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