



ORIGINAL RESEARCH PAPER

General Surgery

PROSPECTIVE STUDY OF ANALGESIC EFFICACY OF RECTUS SHEATH BLOCK IN PATIENTS UNDERGOING LAPAROTOMY FOR POSTOPERATIVE PAIN CONTROL IN COMPARISON WITH CONVENTIONAL ANALGESIC TECHNIQUES

KEY WORDS: Rectus Sheath Block, Postoperative Analgesia, VAS, NRS, Analgesia in Laparotomy.

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ABSTRACT

Background: Pain in the postoperative period in open abdominal surgeries prevents early ambulation increasing risk of deep vein thrombosis, pulmonary atelectasis, leading to increased morbidity, prolonged hospital stay. Surgically placed Rectus sheath catheter is safe and provides good pain relief. **Aims and Objectives:** To compare the efficacy of Rectus sheath catheter block with conventional analgesia technique in postoperative pain control and assess the safety of Rectus sheath catheter block analgesia. **Methodology:** 60 patients posted for laparotomy at R.L.Jalappa Hospital, Kolar from September 2022 to June 2024 were studied, divided into study group with Rectus sheath catheter block (RSB) and control group with conventional analgesia (CA). Postoperative pain evaluated with VAS, NRS and ANVP pain scores, time for requirement of analgesia, secondary complications like nausea, vomiting, tachycardia / bradycardia, Analgesic efficacy, were noted and compared in two groups. **Results:** With VAS score 40% of the cases had mild pain and 10% of the cases had moderate pain in RSB group; 25% of the cases had mild pain, 21.7% moderate pain and 3.3% had worst pain in CA group respectively, significant association between RSB group and CA group (p value =0.035). NRS (p value=0.037) and ANVP scale (p values of 0.002, 0.0002 and 0.010 at 1st hour, 6 hours and 12 hours postoperatively respectively) showed statistical significance. Hypotension, bradycardia and PONV were same among groups. Rescue analgesia within 24 hrs were required more CA group (20%) than RSB(1.7%) (p value =0.0005). Median diclofenac consumption was less in RSB (75 mg) than CA (150 mg) group (p value <0.0001). **Conclusion:** Rectus sheath catheter block provides good postoperative analgesia with out complications like tachycardia, postoperative nausea and vomiting and very rare requirement of rescue analgesia.

INTRODUCTION

Pain is defined as "An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" by the International Association for the Study of Pain'. Midline incision laparotomies results in severe postoperative pain, which produces neuroendocrine stress response^{1,2}. Good Postoperative analgesia aids in early mobilization, lowers the risk of deep vein thrombosis and postoperative pneumonia^{3,4}.

Postoperative pain severity is increased by 86% in midline abdominal operations, extremely painful procedures⁵ and severe pain leads to atelectasis, reduced movement, and troubled sleeping^{6,7}.

Delayed hospital discharge, decreased patient satisfaction, delayed postoperative mobilization increase health care costs⁸.

In midline abdominal surgeries, thoracic epidural analgesia (TEA), abdominal field blocks, and parenteral analgesics are being used⁹. TEA is gold standard choice, but limitations are individual patient contraindications, lack of expertise, hypotension, 6–8% technical difficulties¹⁰.

RSB is beneficial in midline laparotomies, open gynaecological and major urological pelvic surgeries, umbilical and epigastric hernia repair^{11,12}.

RSB is done in four locations on either side of the umbilicus, with 0.25% of 10-15 ml at each location¹³. 0.25% of 30–40 ml bupivacaine in adults¹⁴, 0.2–0.3 ml/kg of 0.25% bupivacaine 2–3 cm from the midline in pediatric group¹⁵ at space between posterior rectus sheath and rectus muscles^{15,16}.

RSB have no hemodynamic alterations and early mobilisation^{17,18}. RSB is effective with land mark approach for laparoscopic surgery^{15,19}, increases quality of life and level of analgesia^{20,21}. Ultrasound-based RSB increase accuracy in obese patients²².

Opioids have side effects, epidural analgesia is difficult technique, not available widely, needs expertise and not suitable for hemodynamically unstable patients^{23,24}.

Objectives

- To compare efficacy of Rectus sheath block with conventional analgesia in post operative pain control
- To assess the safety of Rectus sheath catheter block.

METHODOLOGY

Prospective observational study conducted at R. L. Jalappa Hospital, Tamaka, Kolar, from September 2022 to August 2024 after obtaining approval from the Institutional Ethics Committee. Sixty cases posted for midline laparotomy were included in the study; thirty cases in rectus sheath block group (RSB) and thirty cases in conventional analgesic group (CA) allotted by Computer generated random numbering. Written and informed consent obtained from participants, demographic details, detailed medical history and clinical examination of the patients was done.

Inclusion Criteria: Patients

- Posted for midline laparotomy
- ASA 1 and 2 physical status
- Both genders of age >18 yrs

Exclusion Criteria: Patients with

- Patient refusal
- Known hypersensitivity to local anesthetics
- Severe systemic illness
- Coagulation abnormalities
- Local skin infection at site of needle entry

RSB Group: At end of surgery Rectus sheath layers are separated, feeding tube 8 is placed between two layers of rectus sheath bilaterally under vision, secured with silk suture, flushed with normal saline to prevent occlusion during closure of abdomen. 15 ml of 0.125% bupivacaine is injected.

CA GROUP (CONVENTIONAL ANALGESIA): Inj. Tramadol iv/ imTID .

Breakthrough pain in both groups is treated with INJ. Diclofenac IM .

Table 1:VAS in RSB and CA

VAS	RSB	CA	TOTAL	p value
Mild Pain(2-4)	24	15	39	0.035
Moderate pain(5-7)	6	13	19	
Worst pain(8-10)	0	2	2	
Total	30	30	60	

Table 2: NRS vs RSB Group and CA Group cases

NRS	RSB	CA	Total	p value
Mild pain (1-3)	20	12	32	0.037
Moderate pain (4-6)	9	13	22	
Severe pain (7-10)	1	5	6	
Total	30	30	60	

Table 3: ANVP vs RSB Group and CA Group

ANVP	RSB	CA	p value
1 hr	2.5±0.9	3.4±1.3	0.002
6 hrs	2.5±1.0	3.7±1.3	0.0002
12 hrs	2.7±1.0	4.0±2.5	0.010

DISCUSSION

VAS score; In RSB group 40% had mild pain, 10% moderate pain, 25% had mild pain, in CA group 21.7% had moderate pain and 3.3% cases had worst pain. Difference in NRS score between RSB group and CA group was found to be significant at 1 hour, 6 hours and 12 hours. ANVP scale showed significant difference between the groups at 1 hour, 6 and 12 hours.

Rescue analgesia required for 1.7% patients in RSB group, 20% cases in CA group. Mean first analgesia request time was prolonged in RSB group in comparison with CA. Paracetamol and diclofenac consumption is more in CA group.

Study findings were comparable with; Amir M S et al²⁵, Ghada MNB et al²⁶, Edward T et al²⁷, Al,aa ED et al²⁸, RSB Group used less opioids during and after surgery, mean pain scores were significantly low than control group. RSB group had low sedation score and lower frequency of nausea and vomiting and higher patient satisfaction.

Debas Y M et al²⁹, Diriba T et al³⁰, also showed less analgesic requirement in 24 hours after surgery.

Limitations: Small sample size, single hospital setting. A larger sample size and a large scale study is needed for validation of efficacy.

CONCLUSION

Rectus sheath block is safe and preferred choice of analgesia compared to conventional analgesia for midline laparotomy.

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