



## Effectiveness Of Intercostal Nerve Block In Management Of Pain In Trauma Patients With Rib Fracture In A Tertiary Care Hospital

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### Abstract

**Introduction:** Pain management is the most important thing in trauma patients especially in blunt chest injuries. There are various methods in pain relief like parenteral analgesia, intercoastal nerve block, paravertebral block, and epidural analgesia. Among these intercostal nerve blocks is the simplest procedure done at the bedside by a surgeon without a specialist anesthesiologist.

**Aim of the study:** To evaluate the effectiveness of intercostal nerve block in the management of pain in trauma patients with a rib fracture.

**Materials & Methods:** This prospective study includes 50 trauma patients with rib fractures conducted in GVMCH, Vellore, department of general surgery from November 2018 to July 2019. After considering inclusion criteria patients were given intercostal block under usg guidance. Three groups were made A, B, C based on the visual analogue scale with the score.

**Results:** Visual analogue scale taken before intervention was 7 in 13 patients, 8 in 24 patients, and 9 in 13 patients. After the intervention, responders were patients with the visual analogue scale of 1 and 2, no responders were patients with the visual analogue scale of 3, total responders were 45 and no responders were 5. In group A responders were 13, there were no responders. In group B there were 22 responders and 2 no responders. In group C there were 10 responders. Hence my study proved that the visual analogue scale decreased in all patients, with responders being 45, a score of 7,8,9 which decreased to 1,2,3. By applying paired t-test the observed value is 2.423 whereas the critical value is 9.1040 the study value is less than the critical in a positive direction hence there is a significant positive difference in the test group before and after the nerve block.

**Conclusion:** Intercostal nerve block is a simple and effective method for pain relief in patients with blunt injury to the chest. It reduces morbidity in blunt chest injury by producing pain relief and respiratory effort, thereby speeding up patient recovery.

**Keywords:** Intercostal nerve block, Pain control, Rib fracture

### Introduction

Thoracic injuries are one of the most common injuries resulting from trauma (falls, road traffic accidents, and assault). They vary from simple bruises to rib fractures, including traumatic hemothorax and pneumothorax.[1] Among these injuries due to blunt and penetrating trauma, the most

common forms leading to hospitalization are simple bruises or blunt trauma in the form of rib fractures with complaints of tenderness around the injured area and pain during coughing and breathing. [2]A physical examination along with a chest xray with or without a CT scan demonstrates rib fracture. Pain control is essential for preventing secondary

complications such as atelectasis or pneumonia. The use of aggressive pain control techniques over conventional pain control medication increases patient satisfaction and prevents secondary complications. The purpose of this study is to bring out the benefits of intercostal nerve block as an aggressive pain control measure over conventional medications in terms of hospitalization, medication administration duration, and pain relief degree in patients with thoracic injuries.[3] Thus, depending on the injury severity, differences in treatment methods, hospitalization, and/or treatment duration are determined. Most of the pain is eliminated after 2–3 days of conservative treatment in most common blunt trauma cases, and a prescription of 2–3 weeks of oral analgesics is enough after discharge. [4,5]

**Materials & Methods**

This prospective study was conducted in the Government Vellore medical college, department of general surgery from November 2018 to July 2019. 50 trauma patients with rib fractures assessed clinically and radiologically were taken into study.

patients who met with inclusion criteria were taken into the study. patients were then given intercostal nerve block under usg guidance. The results were derived based on interpretation from the visual analogue scale before and after the intervention.

**Inclusion Criteria:**Age >18 yrs, <70yrs,1-3 Rib fracture patients,Blunt trauma chest (including hemothorax and pneumothorax).

**Exclusion Criteria:** Age <18 yrs, >70yrs,>4 rib fracture patients, flail chest applying paired t-test the observed value is 2.423 whereas the critical value is 9.1040 the study value is less than the critical in a positive direction hence there is a significant positive difference in the test group before and after the nerve block.

**Stastical analysis:** All the data were subjected to statistical analysis using Statistical Package for Social Sciences (SPSS), version 15. Independent t-test for statistical analysis. P-value < 0.05 was considered as statistically significant and P < 0.001 as highly significant.

**Table :1 Age Distribution**

AGE	TOTAL PATIENTS
<20	4
21-30	17
31-40	13
41-50	8
51-60	6
>60	2

**Table :2 Mode Of Injury**

MODE OF INJURY	TOTAL PATIENTS
RTA	23
SELF FALL	13
ACCIDENTAL FALL	14

**Table :3 Injury Present**

FINDING	TOTAL PATIENTS

PNEUMOTHORAX	11
HEMOTORAX	10
LUNG CONTUSION	9

**Table :4 Visual Analogue Scale**

VAS	TOTAL PATIENTS
RESPONDERS	45
NONRESPONDERS	5

**Table :5 Group Wise, Responders& Non Responders**

GROUP	RESPONDER	NON RESPONDER
GROUP A	13	0
GROUP B	22	2
GROUP C	10	3

**Table:6 Group Wise Score**

GROUP	SCORE [1]	SCORE [2]	SCORE [3]
GROUP A	9	4	0
GROUP B	5	17	2
GROUP C	3	1	3

**Discussion**

Blunt trauma chest is a common component of injury in trauma patients. Trauma to the chest can result in significant morbidity and mortality. Pain due to chest injury is a significant component of morbidity. [6]Pain can also indirectly contribute to morbidity by leading to limitation of chest movement, thereby causing respiratory distress. Adequate pain relief is an important component of the management of patients with blunt trauma to the chest. There are various modalities available for pain relief.[7] Options include parenteral analgesia with NSAIDS/opioid analgesics, intercostal nerve block, paravertebral block, and epidural analgesia. While parenteral analgesia is the simplest option available; it may not provide the patient with adequate pain

relief especially in the setting of trauma. Opioid analgesics are useful but may cause respiratory depression especially if it is used in high doses[8]. Thus other modalities of pain relief need to be explored; especially because adequate pain relief can get rid of respiratory distress and thereby dramatically improve patient recovery.[9]Among the different options available, an intercostal nerve block is the simplest procedure that can be performed in the ward setting by the surgeon himself without the need for intervention from a specialist anaesthesiologist. [10] Smedstad KG et.al describes the successful use of intercostal nerve block in patients with fractured ribs who are discharged home from the emergency department with written instructions of the risk of pneumothorax and who to contact in the event they develop dyspnea. Also, an intercostal nerve block is a

very effective modality for pain relief. [11]Whereas the other options like paravertebral block and epidural block, though effective, require a specialist anaesthesiologist and need to be performed in an operation theatre.[12,13] So, considering the effectiveness of pain relief and also the ease of performance, intercostal nerve block stands out as the procedure of choice for pain relief in patients with blunt injury to the chest [14,15]

### Conclusion

Evidence supporting the use of aggressive pain control for rib fracture pain includes not only the aforementioned prevention of potential complications but also the prevention of sustained disability that can develop from the pain not being controlled aggressively enough early on, leading to chronic pain. An intercostal nerve block is a simple and effective method for pain relief in patients with blunt injury to the chest. It reduces morbidity in blunt chest injury by providing pain relief and improving respiratory effort; thereby speeding up patient recovery.

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