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Intercostal Nerve Block: A Simple and Effective Method for Pain Relief in Blunt Trauma Chest

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Abstract:*Chest injuries are one of the leading causes of morbidity and mortality in trauma patients. Significant morbidity can result from pain and respiratory distress in patients of blunt trauma chest.A prospective randomized controlled study was conducted at our institute on patients suffering from blunt trauma chest. A total of 36 patients were studied. Patients were randomized to two groups of 18 each. The first group were treated with intercostal nerve blocks for pain relief. The second group of patients were administered parenteral analgesics.Pain intensity at identified hours was measured in both the groups using the visual analog scale.the outcomes were compared.Pain relief was found to be significantly better with intercostal block compared to parenteral analgesia.*

Conclusion:*intercostal nerve block is a simple and effective method for pain relief in patients with blunt trauma chest.*

Keywords: *blunt tauma chest, intercostal analgesia, trauma*

I. Introduction

Chest injuries are one of the leading causes of morbidity and mortality in trauma patients[1,2].Road traffic accidents are the leading cause of blunt trauma to the chest[1,2]. Significant morbidity can result from pain and respiratory distress in patients of blunt trauma chest. Adequate pain relief is of paramount importance as it can reduce morbidity and dramatically improve patient recovery. Adequate relief of rib and chest-wall pain allows the patient to breathe deeply, avoid intubation[3]. In our study we compare the effectiveness of pain relief provided by intercostal nerve block and by parenteral analgesia.

II. Methods

A prospective randomized controlled study was conducted at our institute on patients suffering from blunt trauma chest. A total of 36 patients were studied. Patients were randomized to two groups of 18 each. The first group (cases) were treated with intercostal nerve blocks for pain relief. The second group of patients were administered parenteral analgesics.

Pain in the two groups were compared using the visual analog pain scale on a scale of 1 to 10; with 0 being no pain, 5 moderate pain and 10 the worst possible pain. The ratings between the two groups were compared.

The average length of hospital stay of the patients in the two groups was also compared.

Inclusion criteria

- Blunt trauma chest
- Age 15-50 years
- 2-4 rib fractures

Exclusion criteria

- Polytrauma
- Pneumo/hemothorax requiring ICD insertion

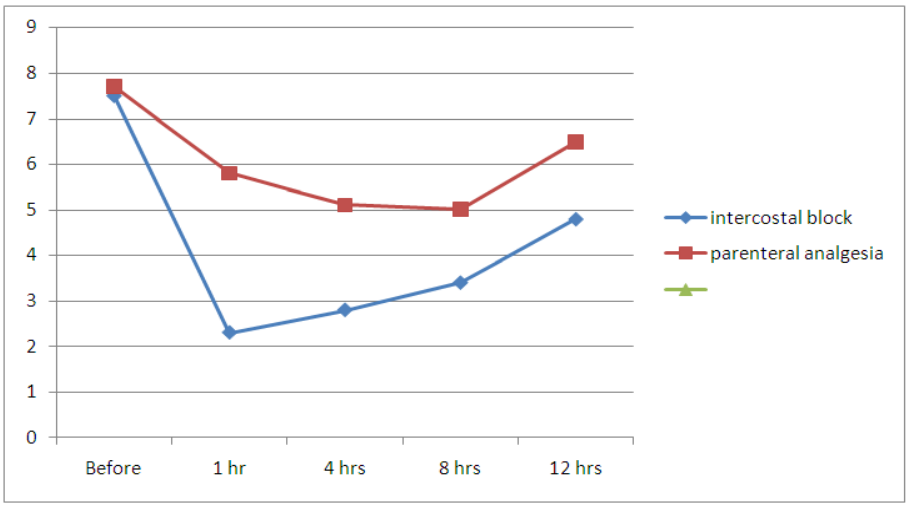
Method of intercostal block[4-6]

0.5% bupivacaine (+ epinephrine) was used. The local anaesthetic (3-5 ml) was injected at the lower border of the rib at a point 6-8cm from the spinous process (midline), after a haem-negative aspiration at an angle of 20 degree cephalad. Process repeated in multiple spaces in case of multiple rib fracture. This was done once in 12 hours.

III. Results

Pain intensity at identified hours was measured in both the groups. The average of pain intensity was calculated and compared between the two groups. P value was calculated to compare the pain intensity between the groups for each interval. Pain relief was found to be significantly better with intercostal block compared to parenteral analgesia.

Time period	Intecostal block	Parenteral analgesia	P value
Before	7.52±1.13	7.66± 1.07	0.71
1 hr	2.32± 0.88	5.82± 0.86	< 0.0001
4 hrs	2.85± 0.95	5.14± 0.92	< 0.0001
8 hrs	3.44± 0.81	5.08± 0.96	< 0.0001
12 hrs	4.82± 0.92	6.45± 0.78	< 0.0001



The average length of hospital stay in the patients receiving intercostal nerve block (2.1 days) was found to be significantly less than ($p < 0.0001$) the duration of stay in patients receiving parenteral analgesia (3.8 days).

IV. 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 the morbidity. 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. 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[7].Thus other modalities of pain relief need to be explored; especially considering the fact that adequate pain relief can get rid of respiratory distress and thereby dramatically improve patient recovery.

Among the different other options available, intercostal nerve block is the simplest procedure which can be performed in the ward setting by the surgeon himself without the need for intervention from a specialist anaesthesiologist. Rauck describes the successful use of intercostal nerve block in patientswith fractured ribs who are discharged home from the emergencydepartment with written instructions of the risk of pneumothorax and who to contact in the event they develop dyspnea[8]. Also, intercostal nerve block is a very effective modality for pain relief[9]. Whereas the other options like paravertebral block and epidural block, though effective, require a specialist anaesthesiologist and need to be performed in a operation theatre. 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.

V. 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 providing pain relief and improving respiratory effort; thereby speeding up patient recovery.

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