A Painful Wait
Rib Fracture Pain Management at a Major Trauma Centre

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Background

The impact of rib fractures on mortality and morbidity are well recognised. Moreover, we now understand that patients who are inadequately pain controlled are more likely to develop complications from a poorly expanding chest wall, such as Lower Respiratory Tract Infections (LRTI). We currently have a risk stratification tool in place that incorporates markers such as age, number of rib fractures and underlying lung pathology to help identify which patients are at higher risk. Treatment can then be tailored to their relative risk to achieve target pain score of 0 or 1 (indicating no pain at rest).

Aim

The primary aims of this audit are to analyse whether patients are receiving appropriate pain control relative to their rib fracture score and risk. Secondly, are these treatments given in a time appropriate manner. In addition, we would like to further assess the association between rib fracture scores and the length of inpatient stay and the risk of developing complications.

Method

Initial patient data was collected from the Trauma Audit and Research Network and patient medical records over a 4 month period .The data comprised of admission dates and times, rib fracture details and scores, pain scores, analgesia given and the outcome/complications for each. This data was then analysed to assess whether we are managing our patients according to their pain and rib fracture scores and whether our risk stratification tool is helping us identify patients at greater risk of complications.

Results

Rib fracture scores are notably higher in patients who develop an LRTI. Average rib score = 32.61 v 21.8 (LRTI v Non-LRTI). P= 0.0002 (CI=95%). Furthermore, 60% with a flail chest developed an LRTI vs 19.5% without. Expressed as relative risk RR = 3. Rib fracture score did not correlate with length of stay (LOS). Avg rib score = 23.85 (LOS >12 days) v 23.31 (LOS $\leq$ 12 days). T-test P value = 0.43 (CI=95%). Spearman Rank correlation showed weak positive association. Rs = +0.1779. Patients were treated with an appropriate level of analgesia compared to rib fracture score, those with scores over 21 receiving PVB/Epidural. Average delay to Paravertebral block = 1.33 days. However, average delay to Patient Controlled Analgesia was 14 h 20m. Average pain score at 0h, 6h, 24h, 48h was 1.63, 1.57, 1.22 and 0.76 respectively.

Conclusion

Clear association of rib fracture score +/- flail segment and the likelihood of developing an LRTI. We are therefore appropriately identifying those at high risk, appear to be managing them appropriately and offering aggressive analgesia in the form of Paravertebral block/Epidural where necessary. No significant delays were seen when offering PVB. However, there was significant time delay when receiving PCA. This correlates with the lack of improvement in pain scores in the early part of admission. More work needs to be done to reduce this waiting time and optimise pain control earlier.