The Impact of Surgery Timing on Patient Pain Intensity on the First Day After Acute Trauma Surgery: Results from the International PAIN OUT Study

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BACKGROUND

Effective pain management after acute trauma surgery is an important component of patient care, as inadequately treated pain negatively affects recovery, initiation of rehabilitation, and length of hospital stay. Various factors are known to influence postoperative pain intensity, but the effect of surgery timing (daytime vs. on-call hours) has been relatively little studied. The timing of surgery may influence anaesthetic management, team fatigue, and the continuity of postoperative care.

AIM

To assess the impact of surgery timing on patient-reported pain intensity on the first day after acute trauma surgery.

METHODS

PAIN OUT is an international registry and project for improving the quality of pain relief, providing a unique web-based information system with the aim of improving post-operative pain management. Hospitals participating in the project collect patient reports and clinical data from medical records on perioperative analgesia. **The obtained data is recorded in the international database "PAIN OUT".**

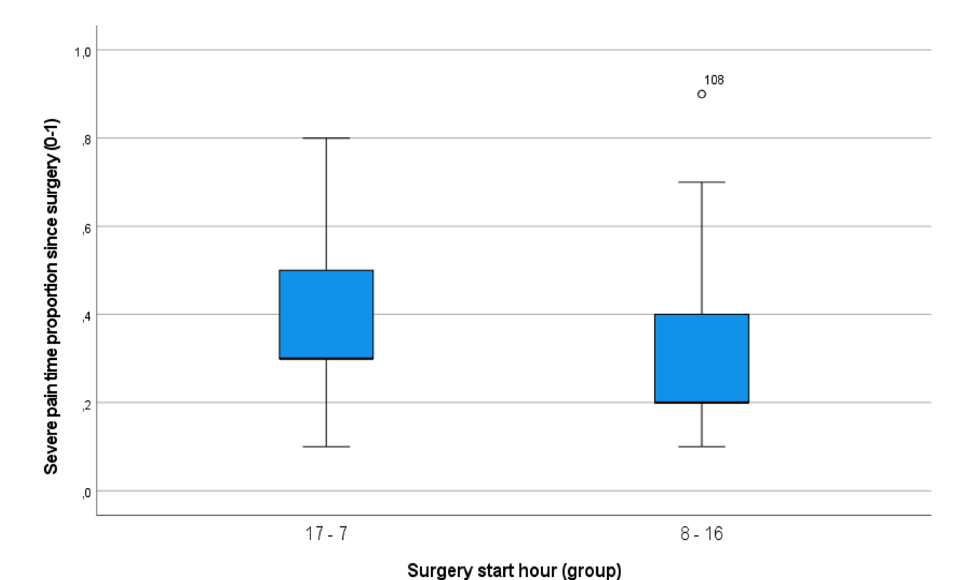
- A total of 129 adult patients who underwent acute trauma surgery at the Hospital of Traumatology and Orthopaedics in Riga, Latvia, were included in this study after Ethics Committee approval.
- Patients on their first postoperative day, who had been in the department or postoperative ward for at least 6 hours after surgery, were randomly selected.
- Patients who agreed to participate completed a questionnaire on least and worst pain after surgery, time spent in severe pain, impact of pain on activities in bed (turning over, changing position) and activities outside of bed (walking, sitting). They also answered questions about the impact of pain on their mood and emotions and the severity of side effects (nausea, drowsiness, dizziness). Questions about the extent of pain relief, desire for more pain treatment, pain-related sleep disturbance were also included.
- Data on pharmacological and non-pharmacological pain management during the perioperative period up to the first postoperative day were obtained from patient records.
- Continuous variables were tesed for normality of the distribution and were presented as mean score (SD) and median. Independent-Samples Mann-Whitney U test was used. All statistical analyses were performed using IBM SPSS Statistics version 29.0.

RESULTS

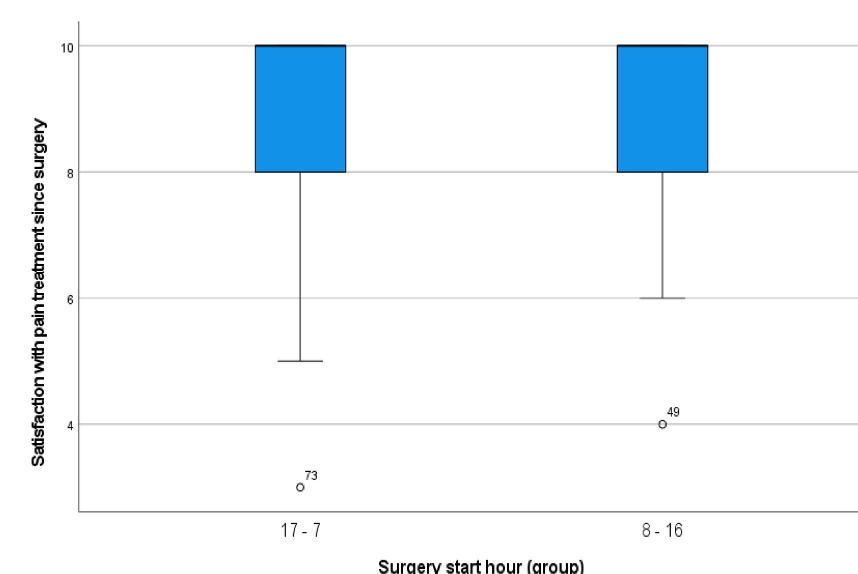
DEMOGRAPHIC DATA				
Surgery star hour (group)	RESPONDENTS	GENDER	AGE (mean score)	BMI (mean score)
8-16	75	33 female 42 male	52.9 ± 17.5	27.46 ± 4.6
17-7	54	27 female 27 male	48.8 ± 17.5	27.45 ± 5.3

Postoperative pain intensity outcomes were compared between two cohorts: patients who had surgery between 8:00 and 16:00 (n=75) and those who had surgery between 17:00 and 7:00 (n=54). In group 8-16 44% (n=33) were women and 56% (n=42), were men with an average age of 52.9, SD=17.5 and mean BMI of 27.4, SD=4.6. In the second group 17-7 the number of both gender is equal (n=27) with an average age of 48.8, SD=17.5 and mean BMI of 27.4, SD=5.3.

A statistically significant difference was found in the proportion of time spent in severe pain since surgery. Among patients operated between 17:00 and 7:00, the median proportion of time in severe pain since surgery was 0.3 [IQR: 0.3–0.5], corresponding to 30% of the time since surgery, whereas for patients operated between 8:00 and 16:00, the median was 0.2 [IQR: 0.2–0.4], or 20% of the time since surgery (p=0.006).

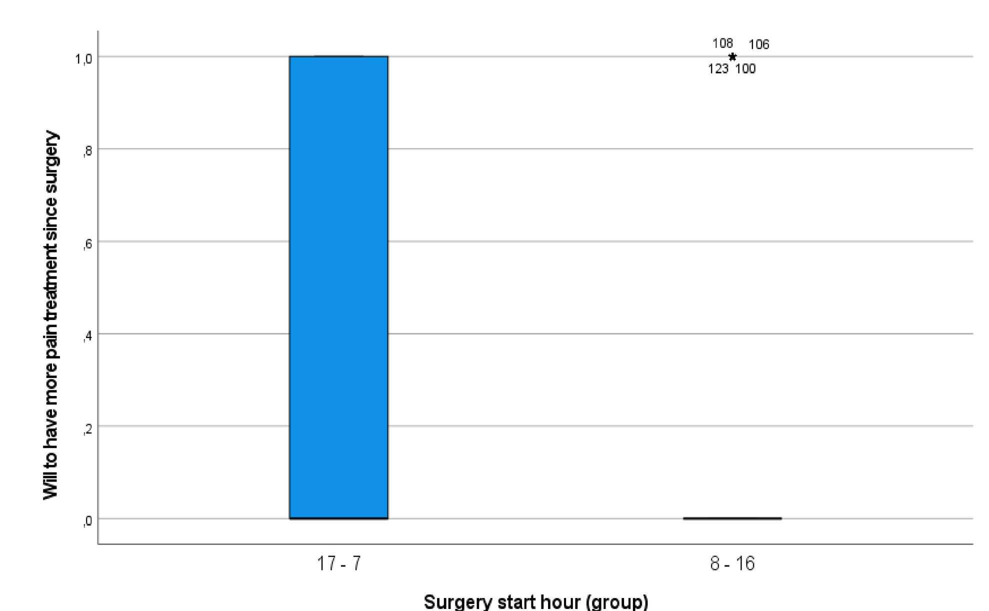


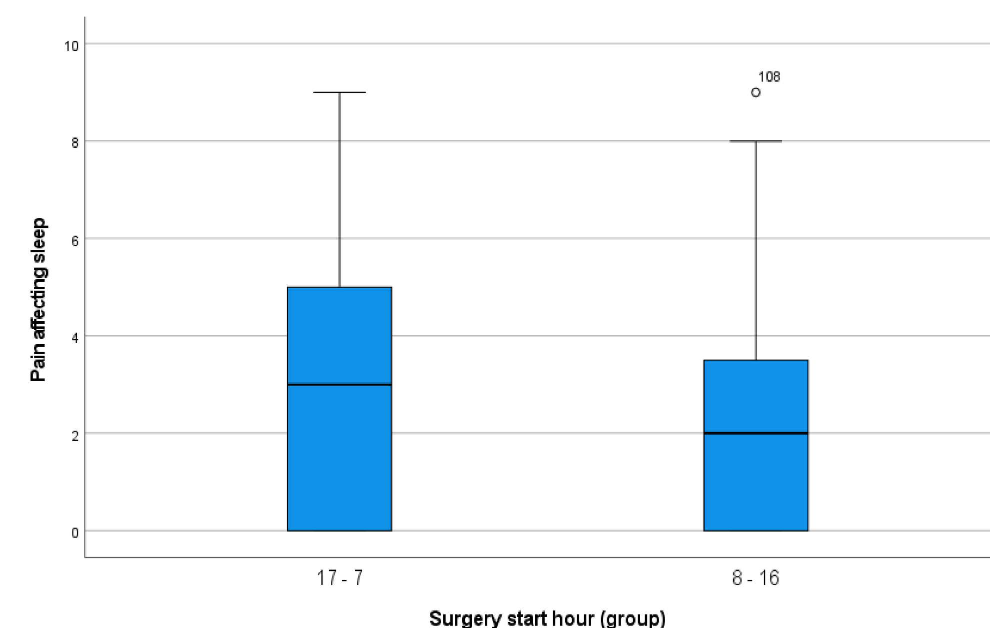
Worst pain since surgery for patients who had surgery between 17:00 and 7:00 the mean score is 5.87, SD=2.42, whereas for patients operated between 8:00 and 16:00 the mean score is 5.73, SD=1.89.



Patients in both groups are satisfied with pain relief since surgery. The average score is high: 9.0, SD=1.4 in group 8-16 and 8.8, SD=1.6 in group 17-7. During the postoperative period, patients receive multimodal pain relief. This includes non-steroidal anti-inflammatory medications, paracetamol and opioid medications.

Although pain relief levels are high, patients opinions on even greater pain relief are divided. In group 8-16 most values are at 0 and this suggests fewer patients in this group wanted additional pain treatment compared to group 17-7.





The results show that sleep quality was lower in patients who underwent surgery between 17:00 and 7:00. The median proportion of pain pain affecting sleep was 3 [IQR: 0-5] and an average score 3.02, SD=2.66. Among patients who had surgery between 8:00 and 16:00 the median proportion was 2 [IQR: 0-4] or 20% lower than before the surgery and mean score 2.28, SD=2.34.

CONCLUSION

The findings indicate that patients who underwent surgery during daytime hours experienced less severe pain on the first postoperative day than patients who underwent surgery during on-call hours. This indicates that pain relief for patients during the night needs to be improved.