

PUBLISHED ABSTRACT

Prevalence of Serious Injuries in Low Risk Trauma Patients

Megha Rajpal George¹, Moira Carroll¹ and Reuben Strayer²

¹ Emergency Department, Icahn School of Medicine at Mount Sinai, New York, New York, US

² Emergency Department, Maimonides Medical Center, Brooklyn, New York, US

Corresponding author: Megha Rajpal George, MD (rajpalme89@gmail.com)

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Background

Computed Tomography (CT) utilization is widespread in contemporary Emergency Departments (EDs). CT overuse leads to radiation exposure, contrast toxicity, overdiagnosis, and incidental findings. This study explores the prevalence of clinically significant injuries in patients identified as low-risk trauma patients (LRTPs) by specified criteria.

Methods

This was a 6-month retrospective chart review of all LRTPs presenting to a level 1 trauma center in Queens, New York. Data abstraction was performed independently by two abstractors and discrepancies adjudicated by the senior author. Patients were identified using the hospital trauma registry and two reports, created by the researchers, identifying selected chief complaints and discharge diagnoses. Definition of LRTP (inclusion criteria):

1. Blunt trauma mechanism in patients aged 18–40 years
2. Persistently normal level of consciousness, no neurologic deficit, and GCS 15 in the ED
3. Without >1 reading of heart rate >100 bpm or respiratory rate >20 in ED
4. Never hypotensive (systolic blood pressure <90) or demonstrating evidence of hypoperfusion
5. Not anticoagulated
6. Without significant baseline disease (ASA class I or II)

Patients were excluded if intoxicated (clinically or serum alcohol level >80 mg/dL), Emergency Severity Index 4 or 5, transferred from another institution, eloped or left against medical advice, baseline paraplegia/quadruplegia, isolated trauma to the extremities, hanging mechanism, or a medical cause precipitating the trauma.

Results

750 patients were identified of which 352 (46.93%) received one or more CT scans. There were a total of 790 CT scans ordered in these patients of which 731 (92.53%) were negative for any acute injury. There were 13 clinically significant injuries of which only one (0.13%) patient had an injury requiring immediate intervention. There were no mortalities in this LRTP group.

Discussion

CT use carries a variety of important harms, mandating that physicians, charged with acting in their patients' best interest, use discretion when deciding on whether to use CT in the evaluation of a given patient.

The primary aim of this observational study was to explore the prevalence of clinically significant injuries and subsequent emergent interventions in a subset of trauma patients who are designated low risk for serious injury by clinical criteria on their initial evaluation. Surgical trauma team activation at our facility is evaluated in three categories of severity (Red, Yellow, Green). Level II (Yellow) surgical trauma team activation patients in this cohort were 4.89 times more likely to receive a CT scan compared to a non-activation trauma. Though trauma activation implies higher injury severity, all included patients had to meet LRTP criteria and therefore had similar baseline characteristics. The use of CT was associated with a statistically significant increase in LOS ($p < 0.0001$) and 93.73% of patients in this cohort were discharged and none of the patients returned to the ED with a missed injury.

Conclusion

Our study demonstrated that the incidence of clinically significant injuries in this population is very low and injuries requiring immediate intervention is even lower. CT utilization in LRTPs should be guided by an explicit consideration of benefit and harm for each patient.

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