Identification of Blunt Traumatic Injury in Patients with Index Admission Imaging

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BACKGROUND

The identification of highly mortal blunt traumatic injuries remains a challenge despite current advents in traumatology. Very few patients suffering blunt aortic/cardiac injuries survive to hospital admission. Due to the infrequency of these patients making to the trauma bay, Traumatologists must have a high index of suspicion for this injury pattern. Timely diagnosis and intervention are of the highest priority in this select trauma population.

OBJECTIVES

Determine reliability of x-ray and ultrasound imaging for diagnosis of Aortic injury, cardiac injury, rib fractures, and hemothorax.

METHODS

All statistical analysis was performed using R statistical software version 4.1.3. Subjects were pulled from the NTDB from years 2016 to 2019 with minors excluded. Cardiac injuries, aortic injuries, rib fracture imaging, sternum fracture imagine, heart injury imaging, and hemothorax imaging were given separate labels for sorting.

RESULTS

Patients suffering any of the following: aortic injury, cardiac injury, rib fractures, and hemothorax. Index imaging included chest Xray or ultrasound findings concurrent with the above injuries. 13,810 patients with index imaging suffered injury, whereas 408,295 patients with index imaging screened negative for our criteria. Of patients screened for injury, 13,810/422,105 = 3.4% of patients suffered one or a combination of the following: Aortic injury, cardiac injury, rib fractures, or hemothorax. Focusing on aortic and cardiac injury diagnosis based on index imaging, 414,078/422,105 = 98.1% ($p<0.001$) of patients *did not* suffer aortic injury, whereas 8,027/422,105 (1.9%) *did suffer* aortic injury. 415,724/422,105 = 98.5% ($p<0.001$) of patients with imaging *did not suffer* cardiac injuries, whereas 6,381/422,105 = 1.5%, *did suffer* cardiac injuries.

CONCLUSION

In patients undergoing index imaging for trauma, Xray and ultrasound screening is reliable in diagnosing: Aortic injury, cardiac injury, rib fractures, and hemothorax. CTA is still considered Gold Standard imaging for diagnosis and surgical planning.

N=422,105	Injury Present	No Injury
Any: Aortic injury, Cardiac Injury, Rib Frac., HTX	13,810 = 3.4%	408,295 = 96.6%
Focused Aortic or Cardiac	8,027 = 1.9%	414,078 = 98.1%