

Plain radiography Compared with Computed Tomography Scan in Detection of Traumatic Injuries of Cervical Spine; a Diagnostic Accuracy Study

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Abstract

Introduction: Although some physicians insist on performing plain radiography for all trauma patients, some others recommend performing it for symptomatic ones. Therefore, the present study has been designed with the aim of evaluating the screening performance characteristics of plain radiography in identifying traumatic neck injuries. **Methods:** The present diagnostic accuracy study was performed on injured patients presenting to the trauma unit of emergency departments of hospitals affiliated with Shahid Beheshti University of Medical Sciences (Imam Hossein and Shohadaye Tajrish), Tehran, Iran, during March 2015 to March 2016. **Results:** 180 patients with the mean age of 32.30 ± 11.32 (16-68) years were evaluated (76.7% male). Most patients (73.3%) were in the 16-40 years age range and the most common mechanism of injury was motor vehicle collision (83.3%). Fracture of the 7th cervical vertebrae was the most prevalent fracture seen in radiography (7.2%) and computed tomography (CT) scan (17.2%). Based on the findings of cervical radiography and CT scan, respectively, 54 (30.0%) and 139 (77.2%) of the patients had at least 1 pathological finding (fracture or dislocation) in their cervical spine. Area under the ROC curve, sensitivity, specificity, positive and negative predictive value, and positive and negative likelihood ratio of plain radiography in detection of traumatic cervical injuries and with 95% confidence interval were 0.568 (0.472-0.664), 33.09 (25.48-41.64), 80.48 (64.63-62.90), 85.18 (72.32-94.62), 26.16 (18.95-34.91), 5.75 (3.00-11.00) and 2.81 (2.43-3.26), respectively. **Conclusion:** Accuracy of plain radiography in detection of traumatic cervical injuries is very low. This is due to the very low sensitivity of plain cervical radiography in detection of fractures and dislocations of the cervical spine. Therefore, it seems that plain radiography cannot be considered as a proper tool for ruling out cervical spine injuries following head and neck trauma.

Key words: Neck Injuries; multiple trauma; Tomography, X-Ray Computed; X-Ray Film; Decision Support Techniques