

Does Prehospital Spinal Immobilization Influence Inhospital Decision to Obtain Imaging after Trauma?

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Purpose: Emergency Medical Services providers perform cervical spinal immobilization when transporting trauma patients to the emergency department (ED), with variable indications for applying a cervical collar. In many Level I trauma centers initial imaging of the cervical spine injury is CT, which incurs financial cost, radiation exposure, and longer stay in the ED. Our purpose was to determine if patients who arrived with a collar were more likely to receive cervical spine imaging than were patients with similar trauma who arrived without a collar. We hypothesized that patients presenting with a cervical collar would be more likely to undergo advanced imaging.

Methods: All trauma patients seen at an urban, Level I trauma center during 4 months in 2013 were reviewed (n = 1438). Demographic and injury data were collected. Patients were stratified by trauma category (designation made at time of injury based on acuity), mechanism of injury, known injury cephalad to clavicles, and placement of a cervical collar. Known injury cephalad to the clavicles was defined as physical signs and/or symptoms of trauma, such as pain, wounds, or hematomas of the head, face, or neck on initial presentation. Cervical spine imaging findings were recorded.

Results: Cervical spine CT was performed for 975 patients (67.8%). 26 (1.81%) sustained a fracture or ligamentous injury, and all had presented with known injury cephalad to clavicles. 161 patients (11.2%) with no known injury cephalad to clavicles had a C-spine CT, but no cervical injury was diagnosed in any of these patients. Category 1 patients with gunshot wounds with injury cephalad to clavicles were more likely to have CT C-spine imaging if they arrived wearing a collar than those without a collar (66.7% vs 14.3%, P = 0.027). Category 2 and 3 patients with injury cephalad to clavicles after motor vehicle collisions (MVCs) (88.2% vs 69.6%, P = 0.011), low-energy falls (88.3% vs 59.4%, P < 0.0001), and assault (86.0% vs 37.1%, P < 0.0001) also underwent CT C-spine imaging more frequently if they arrived wearing a collar. Category 2 and 3 trauma patients without injury cephalad to clavicles were also more likely to undergo CT when wearing a collar after MVC (66.3% vs 21.4%, P = 0.001), low-energy fall (81.8% vs 35.3%, P = 0.016), and pedestrian versus MVC (55.6% vs 12.5%, P = 0.04).

Conclusion: Certain trauma patients were more likely to undergo cervical CT if they arrived to the ED wearing a cervical collar. This suggests that in some instances, a prehospital decision to place a collar ultimately impacted inhospital decision making. We conclude that the visual cue of a patient arriving with cervical spine immobilization may heighten suspicion for cervical injury in a manner independent from the injury itself; this bias, coupled with a low overall incidence of cervical spine injury, argues for usage of consistent guidelines to select patients at acceptably low risk for cervical spine injury and to clear them without advanced imaging.