Inpatient Radiation Exposure in Trauma Patients with Spinal Cord Injury versus Spine Fracture

Introduction: Radiation exposure from medical imaging is an important patient safety consideration. Occupational exposure limits have been determined; however, we lack specific guidelines on patient exposure and little is known about total inpatient exposure. Victims of trauma undergo numerous imaging studies, and spinal imaging confers a high effective dose. We examined the cumulative effective radiation dose for patients with spinal fractures and spinal cord injuries (SCI) admitted to a level I trauma center.

Methods: Retrospective data on all patients with spine injuries were obtained from a database including all individuals hospitalized for bodily trauma at a level I center within a two-year period. Injury severity score (ISS) and cumulative radiation exposure were then determined for 406 patients with spinal fractures and 59 patients with SCI.

Results: Cumulative effective dose for patients with spinal cord injury was 45.11mSv, compared to 37.73mSv in those with spinal fractures without cord injury (p=0.01). Mean radiation dose was higher in patients with an ISS > 16 versus an ISS of 16 or below (p=.001). Patients with SCI had a 25% to 50% likelihood of receiving more than 50mSv of radiation, as did more than 17% of those with fractures.

Conclusion: Patients with traumatic spinal cord injury had significantly higher radiation exposure and ISS than those with a spine fracture without SCI; however, SCI and ISS were found to be independently predictive of higher radiation dose. Effective dose was high in both populations, and numerous patients had exposures over the occupational limit.