Does Diagnostic Imaging in Trauma Patients Increase the Probability of Cancer?

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INTRODUCTION: Patients with complex polytrauma are often exposed to substantial diagnostic medical radiation because of serial imaging studies for injury diagnosis and subsequent management within the first year of injury. This cumulative radiation exposure may increase the risk of subsequent malignancy.

METHODS: A retrospective review of service members from 2005 to 2018 in the Department of Defense Trauma Registry was performed. Patients were linked to the Military Health System to identify subsequent cancer related pathology. Generalized Linear Models were built with total radiation exposure, injury severity score (ISS), and number of imagining studies as predictor variables for presence of a cancer pathology.

RESULTS: We identified a positive relationship for radiation exposure (total studies) and the onset of a cancer in 4,134 service members. Patients with low dose radiation exposure (~1 mSv) had a 5% probability of developing any cancer pathology. However, at higher dosages (~308 mSv), this probability increased to 8%. For the total number of imaging studies, we found that service members have 5% probability of developing a cancer pathology when a single imaging study has been performed. However, when service members were exposed to 240 imaging studies or more, this increased to 12%.

DISCUSSION AND CONCLUSION:

Clinical practice guidelines are desperately needed to reduce or minimize radiation exposure. It is also important for treating physicians to seriously weigh the risk and benefits of every imaging study ordered because each test does not come without a cumulative risk.