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Chest x-ray as a screening tool for blunt thoracic trauma in children.

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Abstract

BACKGROUND: With the increasing use of thoracic computed tomography (CT) to screen for injuries in pediatric blunt thoracic trauma (BTT), we determined whether chest x-ray (CXR) and other clinical and epidemiologic variables could be used to predict significant thoracic injuries, to inform the selective use of CT in pediatric BTT. We further queried if these were discrepant from factors associated with the decision to obtain a thoracic CT.

METHODS: This retrospective cohort study included cases of BTT from three Level I pediatric trauma centers between April 1999 and March 2008. Pre-CT epidemiologic, clinical, and radiologic variables associated with CT findings of any thoracic injury or a significant thoracic injury as well as the decision to obtain a thoracic CT were determined using logistic regression.

RESULTS: Of 425 patients, 40% patients had a significant thoracic injury, 49% had nonsignificant thoracic injury, and 11% had no thoracic injury at all. Presence of hydrothorax and/or pneumothorax on CXR significantly increased the likelihood of significant chest injury visualized by CT (adjusted odds ratio 10.8; 95% confidence interval, 6.5-18), as did the

presence of isolated subcutaneous emphysema (adjusted odds ratio, 19.8; 95% confidence interval, 2.3-168). Although a normal CXR finding was not statistically associated with a reduced risk of significant thoracic injury, 8 of the 9 cases with normal CXR findings and significant injuries involved occult pneumothoraces or hemothoraces not requiring intervention. Converse to features suggesting increased risk of significant injury, the decision to obtain a thoracic CT was only associated with later period in the study and obtaining a CT scan of another body region.

CONCLUSION: CXR can be used to screen for significant thoracic injuries and direct the selective use of thoracic CT in pediatric BTT. Prospective studies are needed to validate these findings and develop guidelines that include CXR to define indications for thoracic CT in pediatric BTT.

LEVEL OF EVIDENCE: Prognostic study, level III.

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