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The Effect of Weather on Orthopedic Injury Presentation to the Emergency Department

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Type: Original Research

Background: Predicting patient flow and presentation in the emergency department (ED) is difficult. Chief complaints vary and often appear random from an anecdotal perspective. Prior studies attempting to correlate weather conditions with orthopedic injuries have been conflicting. The purpose of this study was to explore associations between weather patterns and orthopedic presentations to the UNMC ED.

Methods: Retrospective chart review was conducted at a tertiary academic hospital with 64,000 annual ED visits. Utilizing electronic medical records, all patients visiting the ED between 9/1/2012 to 4/30/2019 were included. ICD10 codes identified patients diagnosed with fractures of upper (distal forearm through wrist) and lower (proximal femur and hip) extremities. Daily weather patterns were obtained through the National Oceanic and Atmospheric Administration, specifically daily temperature, amount and type of precipitation (none, rain/melted snow, ice/snow). Logistic regression was used to determine if weather conditions were predictive of fractures. Results are displayed as odds ratios and 95% confidence intervals. P<0.05 was considered statistically significant.

Results: Over an 80-month period 373,409 patients were included, with 4,416 fractures identified. Overall, there was a statistically significant association between snow/ice and fractures ($p<0.0001$). Specifically, an increased risk of upper extremity fracture (OR 1.47, CI 1.28-1.69) and lower extremity fracture (OR 1.25, CI 1.02-1.53). The risk of upper extremity fracture further increased when snow/ice accumulation was > 3 inches (OR 2.64, CI 1.91-3.65). Rain/melted snow was not associated with increased fractures.

Discussion: Prompt compressive therapy obviates complications of infection, fluid expansion and tissue necrosis, which when present require more invasive interventions. With small, acute lesions, compression alone often suffices for resolution, however, larger lesions can require percutaneous drainage, sclerodesis or debridement. Our case highlights the need to consider Morel Lavallée lesions in expanding soft tissue injuries, even when not associated with high velocities.

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