



Physical Anthropology Section - 2014

H55 Trauma Patterns of Accidental and Intentional Injury

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After attending this presentation, attendees will be informed about current research and methods utilized in characterizing fractures that result from accidental and intentional trauma. Attendees will understand how this analysis will take patterns of traumatic injury, demographic characteristics, and features of the injuries into account in an effort to discern patterns between the two causes of injury.

This presentation will impact the forensic science community by demonstrating how fracture patterns within a contemporary skeletal collection conform to known research regarding the patterns expected for intentional and accidental injury.

The ability to determine the cause of skeletal trauma — that is, a bodily injury produced by blunt, sharp, or ballistic forces — is critical in assessing the manner of death as homicide, accident, suicide, natural, or unknown. Current scholarship demonstrates that injuries resulting from accidents tend to be more widely distributed throughout the skeleton, while injuries resulting from intentional causes have a tendency to be more localized. However, researchers have not yet adequately addressed if there is a unique, identifiable pattern inherent to the injuries that result from different causes (i.e., an accident or intentional injury) or what the statistical specificity and sensitivity of these patterns is likely to be. The purpose of this study was to examine the patterns of injury between known accidental and intentional trauma cases while analyzing fracture features, and the location of injuries in individuals of varying ages, sexes, and ancestries. The William M. Bass Donated Skeletal Collection was utilized for this study and provides a sample of modern individuals (N=66). Information was collected in three areas, demographics, fracture features, and injury features. First, demographic characteristics of individuals (i.e. age, sex, and ancestry) will be recorded for each skeleton. If sex, age, or ancestry could not be determined, then they were labeled as unknown in that category. Second, fracture features (e.g., type, size, etc.), and fracture location (i.e. bone, side, specific location) were assessed via macroscopic examination of skeletal material and radiographs. This data will allow a further elucidation of what kinds of injuries occur from different causes, as well as what areas of the bone may be biomechanically more susceptible to certain injuries.

Statistical analysis of this sample shows that there are differences between the accidental and intentional trauma types regarding some of the features in question. Chi-square analyses have shown that intentional injuries in this sample tend to be less distal than expected and have more ballistic and radiating fracture types than expected ($p < 0.05$). Accidental injuries tend to be overall more varied by location and tend to have less ballistic fracture types and more crush injuries than expected ($p < 0.05$). Concerning the location of injuries, intentional trauma had fewer injuries to the right side than expected and more injuries than expected for trauma that involved both sides. Accidental trauma had more left sided injuries than expected and fewer injuries than expected in cases where both sides were affected. Males in this sample exhibited more intentional injuries than expected, while females had less intentional injuries than expected and more accidents than expected.

These findings show that there are statistically significant differences between accidental and intentional trauma types for the selected sample as concerns demographic and fracture characteristics. The patterns conform in some respects to established literature; for example, the intentional injuries tended to be less distal than expected. This analysis is preliminary, however, and highlights the need for further research to fully define these patterns and assess their utility in different regions.

Trauma, Fractures, Accident