

## Shot, but Not Forgotten: Predicting Long-Term Consequences of Gun Shot Wound-Related Injuries

Thursday 12:15-12:45 PM | HP226-SD-THA3 | HP Community, Learning Center, Station #3

### PURPOSE

There continues to be profound lack of substantial information related to gun violence, particularly in predicting long term outcomes. As sites of initial evaluation and follow up, healthcare centers are in a unique position to study predictors of health in patients with a history of gunshot wound (GSW) who represent to the emergency room (ER). The goal of our study was to identify variables that may help predict readmission or reoperation in patients with a history of GSW.

### METHOD AND MATERIALS

A retrospective analysis was performed by searching a database from a single institution for non-acute GSW-related imaging exams from January 2018 to April 2018. Their original GSW-related injury pattern on imaging was recorded (neurologic, vascular, visceral, musculoskeletal, multiple) and clinical information regarding prior hospital course (admitting unit) and subsequent encounters (readmission, surgical history) was collected. Demographics (age and gender) were also collected. Imaging studies were examined for bullet morphology (intact, deformed/shrapnel). A total of 174 imaging studies for 110 patients were queried.

### RESULTS

The average patient age for our non-acute GSW patient population is 49.7 (SD 16.3) with men accounting for 91.8% (N=101) of non-acute GSW-related imaging. Partial correlation was used to explore the relationship between injury pattern on prior imaging and readmission whilst controlling for age. There was a moderate positive correlation between injury type, namely neurologic and visceral, and subsequent readmission, which were statistically significant  $r(107) = .436$ ,  $N=110$ ,  $P < .001$ . However, an inspection of the zero order correlation ( $r = .514$ ) suggested that controlling for age had some effect on the strength of the relationship between the two variables. There was a moderate positive correlation between admitting unit (i.e. ICU) during initial GSW encounter and subsequent reoperation, which was statistically significant  $r(107) = .494$ ,  $N=110$ ,  $P < .001$ . An inspection of the zero order correlation ( $r = .495$ ) suggested that controlling for age had very little effect on the strength of the relationship between these two variables. Logistic regression was performed to assess the impact of a number of factors on the likelihood that GSW patients would be readmitted. The model contained independent variables (age, injury type, region injured, and bullet morphology). The full model containing all predictors was statistically significant,  $X^2(5, N=110) = 56.8$ ,  $P < .001$ . The strongest predictor of readmission was prior injury type, namely visceral injury, with an odds ratio of 6.44.

### CONCLUSION

This retrospective study suggests an association between GSW injury type and readmission. Furthermore, patients who had a prior visceral GSW-related injury were more likely to be readmitted than other GSW-related injuries.

### CLINICAL RELEVANCE/APPLICATION

Morbidity and outcomes from gun violence can only be assessed after a firm understanding of injury patterns on imaging. A location/injury severity scale based on imaging findings could be used to predict long term consequences as well as extrapolate costs, and quality of life years (QALYs).