RECURRENT VIOLENT INJURY: MAGNITUDE, RISK FACTORS AND OPPORTUNITIES FOR INTERVENTION FROM A STATEWIDE ANALYSIS

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KEY FINDINGS
More than 11% of patients presenting to a hospital with a violent injury return to a hospital with another violent injury within two to three years. Recurrent violent injury is common and costly. Effective prevention programs should also target high-risk patients in non-trauma centers where most receive care.

THE QUESTION
Interpersonal violence caused more than 16,000 deaths, 140,000 hospitalizations, and 1.6 million emergency department (ED) visits in the U.S. in 2010, for a cumulative $8.5 billion on medical costs. Recurrent injury is a promising target for prevention, as prior injury is a strong predictor of future violent injury and death. But the incidence of recurrent violent injury, on an area-wide level, is unknown, and the risk factors contributing to it are not well understood.

Previous research has used data from a single hospital or small area, thus missing people who return to a different facility for their second injury. This study includes all non-federal hospitals in Florida, and tracks patients with a violent injury in 2010 to improve our understanding of where they seek care, how many return with a new injury, risk factors that predict recurrence, and the overall cost of recurrent violent injury.

THE FINDINGS
Rates of recurrence
Of nearly 54,000 patients presenting for a violent injury in 2010, 11% experienced another violent injury in the next two to three years. Of the recurrent injuries, 5.6% were classified as severe. About 37% of the index patients were women, but recurrence rates did not differ by gender. The median time to recurrence was 307 days.

Risk factors for recurrence
Compared with patients aged 18-35, those younger than 18 years and older than 55 years has lower odds of a recurrence, whereas those aged 35-54 years had 60% higher odds of severe recurrence. Those living in low-income areas had 20% increased odds of recurrence, but equal odds of severe recurrence.

Compared to patients with private insurance, those with Medicaid or no insurance had about double the odds of recurrence, and increased odds of severe recurrence. Homeless patients had 60% increased odds of any recurrence, but no significant increase in severe recurrences.

Compared to white patients, black patients had 10% higher risk for recurrence overall and 40% higher odds of severe recurrence, while Hispanic patients had 30% lower odds of recurrence.

Where people sought care
Trauma centers saw 31% of index injuries and 33% of recurrent injuries, but saw 56% of the most severe index injuries and 52% of the most severe recurrent injuries.

Nearly 60% of those with a recurrent injury presented to a different hospital for their second injury. Women, black patients, rural residents and those 35 years or older were more likely to return to the same hospital. The odds of returning to the same hospital decreased as the interval between injuries increased, and in patients with mental health visits.

Costs
Overall, violent injury accounted for $596 million in charges, and $131 million in costs...
BRIEF

Research

LDI (using hospital-specific cost-to-charge ratios), for patients with an index injury in 2010. The index injury accounted for $105 million of these costs, and recurrent violent injuries for $25.3 million.

THE IMPLICATIONS

Recurrent violent injury is common and costly. This study, the first state-wide analysis of its kind, helps us to understand where people seek care for violent injuries and the risk factors for recurrence, which can inform prevention strategies.

Using a statewide, all-payer database, the study could follow patients regardless of where they sought care. Nearly 60% of patients went to a different hospital for their second injury, which means that previous single-center studies have likely underestimated recurrence.

Hospital-based violence intervention programs, which initiate a prevention program after the first injury, have shown promise in reducing recurrence. They have been primarily used in trauma center hospitals, but this study underscores the importance of prevention strategies in non-trauma centers. Almost two-thirds of patients went to a non-trauma center for their original injury, highlighting a missed opportunity for an intervention.

By identifying risk factors, these results can help health systems identify populations that could benefit the most from effective prevention strategies, such as the homeless and those with behavioral health needs. Patients who present for an initial injury who have identified risk factors could be directed for more detailed risk assessment or intervention, allowing health systems to allocate violence prevention resources appropriately.

NEARLY 60% OF PATIENTS WENT TO A DIFFERENT HOSPITAL FOR THEIR SECOND INJURY, WHICH MEANS THAT PREVIOUS SINGLE-CENTER STUDIES HAVE LIKELY UNDERESTIMATED RECURRENCE.

THE STUDY

In this retrospective cohort study, the authors examined statewide data on all patients presenting to an emergency department, or admitted to a hospital, for injuries due to interpersonal violence in Florida in 2010. They tracked subsequent visits for new violent injuries in these patients through the end of 2012. The intereval was long enough to capture most recurrences, while being short enough for trauma centers and violence prevention programs to feasibly replicate care.

The authors used data from the Agency for Healthcare Research and Quality’s Healthcare Cost and Utilization Project (HCUP), which includes all ED discharges and admissions to nonfederal hospitals, and associated hospital charges and costs. Patients who died of their index injury or died without a documented recurrence were excluded from the study, as were out-of-state residents. Patients who died of a recurrent injury were included.

To assess the relevance of a statewide versus single-center study, the authors tracked whether patients sought care for a second injury at the same hospital and whether they were treated at a designated trauma center. From diagnosis codes, the authors calculated severity scores for each injury, and also assessed whether the patient had a visit for an alcohol-related disorder, substance use, mental illness, or unintentional injury in the study period. They considered a variety of demographic variables in their analyses, including age, sex, race/ethnicity, homelessness, urban/rural location, median income of home zip code, and insurance type.


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