Epidemiologic Trends in Orbital and Facial Fractures Associated with Television and Computer Devices

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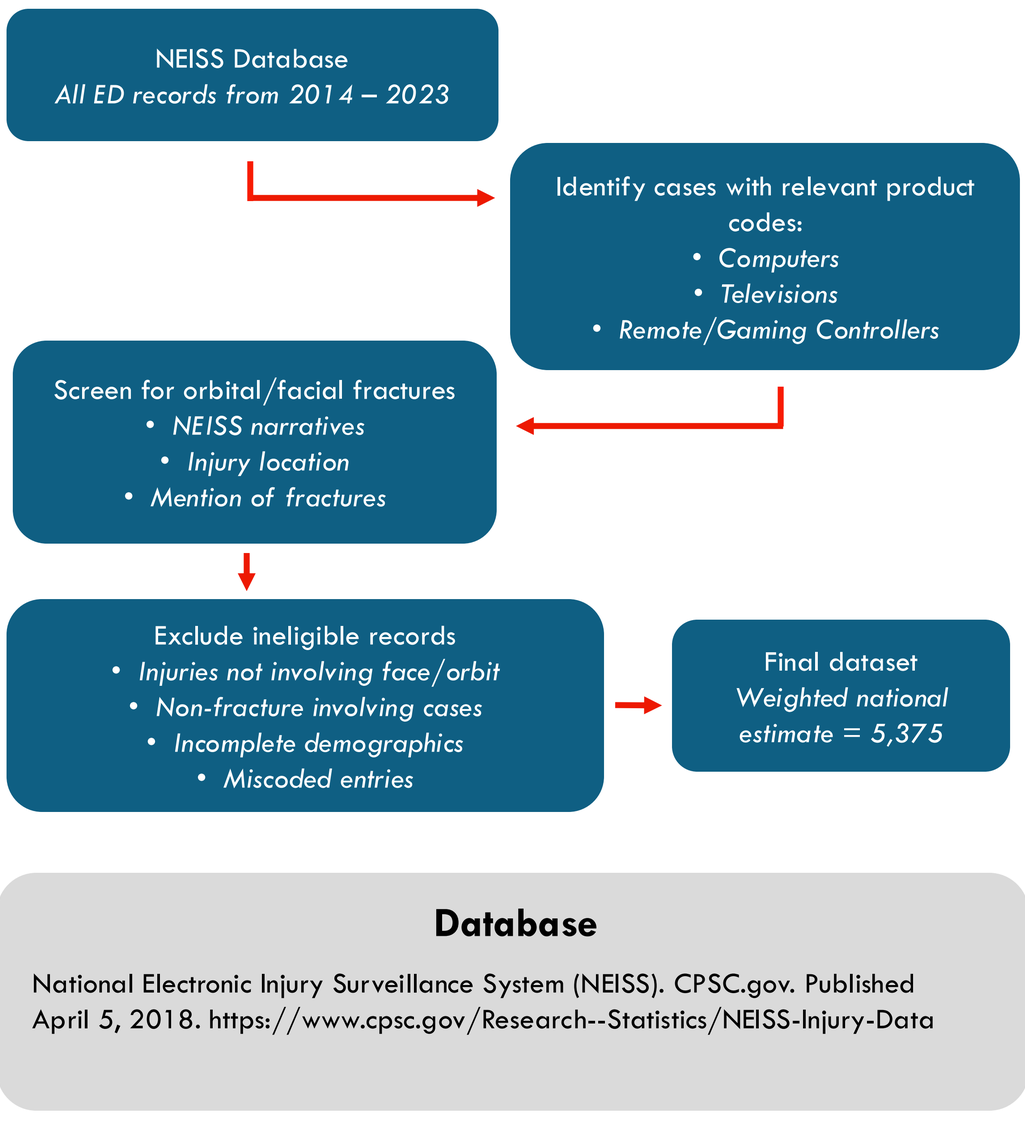
Introduction

Orbital and facial trauma is associated with significant morbidity, disfigurement, and loss of function. While research has been conducted on facial fractures caused by sports and recreational activities, there is a notable gap in the literature regarding these injuries related to consumer electronics such as computers and televisions, which have seen increased use in the past decade. This study aims to analyze the incidence, demographics, and severity of facial trauma associated with these devices using data from the National Electronic Injury Surveillance System (NEISS).

National Electronic Injury Surveillance System

The National Electronic Injury Surveillance System (NEISS) is a data collection program managed by the U.S. Consumer Product Safety Commission (CPSC) that captures information on consumer product–related injuries treated in hospital emergency departments. It uses a nationally representative sample of around 100 hospitals of varying sizes and geographic locations across the United States. From these data, the NEISS generates weighted estimates of the total number of product-related injuries occurring nationwide, along with associated patient demographics, nature of the injury, and circumstances of the incident. NEISS data can be used to identify trends, evaluate the effectiveness of regulatory measures, and develop targeted injury-prevention strategies. The NEISS is considered one of the most reliable sources for estimating the burden of consumer product–related injuries in the U.S.



Database

National Electronic Injury Surveillance System (NEISS). CPSC.gov. Published April 5, 2018. https://www.cpsc.gov/Research--Statistics/NEISS-Injury-Data

Methods and Materials

This retrospective study utilized the NEISS database to identify cases of orbital and facial fractures associated with computers and televisions over a ten-year period from 2014 to 2023. Data collected included weighted incidence, patient demographics, date of injury, anatomical location of injury, incident narrative, and patient disposition. Descriptive statistics were computed to outline basic demographics and injury patterns. Patient and injury characteristics were compared using chi-square and independent t-tests. Multivariate regression was utilized to identify independent predictors of severe injuries requiring hospital admission or surgical intervention.

Results

From 2014 – 2023, there were an estimated weighted national total of 5,375 patients (95% CI 3,926 – 6,825) who presented with facial fractures associated with computer device or television use. The mean age of patients was 53.6 years, with a higher incidence in males (51.7%) compared to females (48.3%, $p < 0.005$). Anatomical locations involved, when specified, included nasal bones (37.1%), the orbit (8.5%), the ear (6.1%), cranial bones (4.9%), and facial bones other than the orbit (12.7%). Furthermore, 8.1% of cases involved fractures in the neck or cervical spine. The most common mechanism of injury was blunt trauma from a device, with 47.8% of cases related to televisions, 33.2% to computers, and 12.6% to remote or video game controllers. Alcohol or other controlled substances were involved at the time of injury in 10.1% of cases. 30.8% of patients experienced more severe injuries, defined as requiring hospital admission. Compared to the years prior to the onset of the COVID-19 pandemic (between 2014 and 2019), there was a significant increase in incidence of injury from 2020 – 2021 ($p < 0.001$). Patients under the age of 35 were more likely to sustain injuries from computers than other devices ($p < 0.05$). Multivariate regression analysis identified the male sex, the involvement of alcohol and other substances, and the involvement of televisions as significant predictors of severe injury ($p < 0.001$ for all variables).

Discussion & Conclusions

This study provides an analysis of facial fractures associated with computer and television devices using the NEISS database. Nasal bones and orbits were the most common locations of injury. Severe injuries requiring admission were more likely among males, those who were using alcohol or other controlled substances at the time of injury, and injuries involving television units. The results underscore the importance of targeted preventive measures and patient education strategies to mitigate the risk of injury. The significant increase in injuries during the COVID-19 pandemic period suggests a potential shift in behavior patterns that warrants further investigation.