Electric Scooter

An e-scooter, short for electric scooter, is a two-wheeled vehicle powered by an electric motor. These scooters are becoming increasingly popular in urban areas as a mode of transportation for short distances, such as commuting to work or running errands. E-scooters are usually lightweight, compact, and easy to maneuver, making them a convenient option for navigating through busy streets and crowded sidewalks.

E-scooters are typically rented out by ride-sharing companies through mobile applications, allowing users to unlock and use the scooter for a fee. They are also available for purchase for personal use. E-scooters have gained some criticism due to safety concerns, as accidents and injuries have been reported, but their popularity continues to grow as cities seek to reduce traffic congestion and emissions.

Case Reports Indicate a Growing Public Health Concern [1].

Outcome

To determine the incidence, demographics and injury patterns involved in E-Scooter-related hospital admissions due to significant trauma compared with bicycle-related trauma within England and Wales. To compare morbidity and mortality between groups.

Design: A retrospective cohort study based on data which has been prospectively collected and submitted to the UK Trauma Audit and Research Network (TARN) registry.

Setting: Major trauma centres and trauma units within England and Wales.

Participants: Patients of any age who were admitted to hospitals in England and Wales with injuries following E-Scooter or bicycle incidents between the dates 1 January 2021-31 December 2021. All patients must have met TARN database inclusion criteria.

Outcomes: In-hospital mortality, critical care admission and length of stay (LoS), hospital LoS and discharge destination.

Results: There were 293 E-Scooter trauma incidents compared with 2538 bicycle incidents. E-Scooter users were more likely to be admitted to a major trauma centre ($p=0.019$) or a critical care unit ($p<0.001$). Serious head and limb trauma (Abbreviated Injury Scale >2) occurred more frequently among the E-Scooter cohort (35.2% vs 19.7%, $p<0.001$ and 39.9% vs 27.2%, $p<0.001$, respectively) while serious chest and pelvic trauma were greater among bicycle users ($p<0.001$ and $p=0.003$, respectively). Over one-third of E-Scooter injuries were incurred outside the current legislation by patients who were intoxicated by alcohol and drugs (26%, 75/293) or under the age of 17 (14%, 41/293).

Conclusions: These early results suggest a greater relative incidence of serious trauma and an alternative pattern of injury among E-Scooter users compared with bicycles.

Trial registration number: TARN210101 [2)]

Literature review

Severe TBI after e-scooter use is associated with high morbidity and is likely underdiagnosed in the literature. Awareness and public policies may be helpful to reduce the impact of an injury [3)].

Electronic health records were retrospectively searched for terms related to E-Scooters between 2018 and 2021. Eight case series were included and described. A literature search of PubMed, Ovid MEDLINE and Embase for terms 'E-scooter or electric scooter' was also conducted from inception to 6 March 2021. A total of 825 articles were initially reviewed. Following the removal of duplicates and those meeting the exclusion criteria, 29 articles were analysed in full and included in this review.

All cases described a head injury of some nature with over half suffering more severe injuries including cranial fractures (most commonly basal skull) or intracerebral haemorrhages (ICH). Spinal fractures were also seen. All required imaging and admission to the hospital. Only a minority required inpatient neurosurgical intervention above conservative measures but almost all required outpatient follow-up. On review of the literature, head injuries were present in 38.8% of all presentations. The majority of which were minor head injuries or concussions; however, approximately 15% involved ICH or skull fractures, respectively. Spinal injuries were less common. Riding while intoxicated and without a helmet was frequently seen within the literature. [4)].

Case series

In a registry-based study, data were retrieved from the Oslo TBI Registry-Neurosurgery and included adult patients with injury-related intracranial findings admitted to Oslo University Hospital (OUH). The study focused on a period of time when OUH was in any level of preparedness because of the COVID-19 pandemic; March 2020 to August 2021. For comparison, the study used patients hospitalized for TBI in 2018 and 2019.

Results: A total of 1,310 hospitalized patients with TBI were divided into 2 groups; pre-pandemic and pandemic. Direct referral to early rehabilitation was maintained. Patient volume remained stable, and there were no differences between the groups regarding patient characteristics and acute management, although there was a significantly higher proportion of TBIs secondary to electric scooter accidents in the pandemic group [5)].

In a cohort study, e-scooter riders were younger than bicyclists, did not use helmets, were more often intoxicated, and were more often injured during nighttime. The rate of intoxication among e-scooter riders injured at night was high. Preventive measures, including awareness campaigns, regulating e-scooter availability, improving infrastructure, and implementing stricter helmet and alcohol policies, may prove effective in reducing injuries [6)].

Alcohol intoxication and the lack of a helmet were common in TBIs caused by electric scooter (ES) accidents. Most of the accidents occurred late at night. Targeting these modifiable factors could decrease the incidence of ES-related TBIs [7].

Schlaff et al. reviewed the electronic medical record of The George Washington University Hospital to investigate and characterize the types of electric scooter-related injuries resulting in neurosurgical consultation in the 15-month period of the Washington, DC, scooter pilot program. Thirteen patients sustained injuries serious enough to merit neurosurgical consultation, including 1 patient whose symptoms required procedural intervention by a neuro interventional radiologist and another patient who was pronounced dead soon after arrival at the hospital.

In this case series, they highlight more severe injuries that resulted in hospitalization or intervention, including skull fracture, central cord syndrome, and vertebral compression fracture. This case series aims to illustrate the potential severity of injuries related to electric scooters, raise awareness on the issues of safety and public health, and call for further investigation into injuries relating to electric scooters. [8].

1)
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