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IMPACT OF PERSONAL MOBILITY DEVICES ON THE RISK OF MAXILLOFACIAL INJURIES ACROSS DIFFERENT AGE GROUPS

Boymuradov Shukhrat Abdujalilovich1
Khatamov Ulugbek Altibayevich2
1DSc, Professor, Head of the Department of Facial Surgery and Dentistry, Tashkent Medical Academy, https://orcid.org/0000-0002-2379-1592
2PhD, Doctoral Student of the Department of Maxillofacial Surgery, Tashkent State Dental Institute, https://orcid.org/0000-0001-8466-3036

Abstract
Currently, there is a high demand for personal mobility devices, particularly "electric motor scooters." Today, this type of transport is widespread among modern countries, including Central Asian countries, and our country, Uzbekistan, is no exception. It has gained a place among other nations in making personal mobility devices available for public use.

Keywords: personal mobility devices (PMDs), negligence, protective gear, software, lethality, maxillofacial injuries.

Introduction

Personal mobility devices (PMDs) are seen as optimal means for transportation, yet they have several shortcomings that became apparent only after their widespread adoption among our population. One significant factor contributing to the increased risk of maxillofacial injuries is the lack of age restrictions and inadequate knowledge of traffic rules and proper PMD usage among children. Observations reveal that children use PMDs for recreational purposes, often ignoring safety rules, traffic regulations, and PMD usage guidelines.

According to traffic accident statistics over four years from the state traffic and safety services, the data shows an increase in collisions involving PMDs. From 2019 to 2020, there were 731-839 cases of PMD collisions with other vehicles, and by 2022, there were 1136 cases of PMD collisions with other vehicles, particularly cars. This indicates a rise in traffic accidents associated with electric scooters. Most of these incidents are due to the lack of designated lanes for PMDs. The lethality of these accidents is directly related to the neglect of PMD usage rules and the disregard for protective gear.

Given the extensive use of PMDs, literature was reviewed to include some epidemiological data concerning the localization of injuries sustained while using PMDs and the age groups affected by electric scooter use.

Materials and Methods

Electric scooters, as PMDs, have been recognized as transportation means in Uzbekistan, reflecting their ease of use and accessibility. This recognition is evident in the statistics of fatal and non-fatal injuries.

According to data from the National Electronic Injury Surveillance System (NEISS) analyzed by K.X. Farley, there was a sixfold increase in injuries involving electric scooters from 2014 (4,881 cases) to 2019 (29,628 cases). By the end of October 2019, the International Transport Forum (I.T.F.) reported 38 fatal injuries related to the use of electric scooters, with over 90% of the fatalities involving electric scooter users. Of those fatal injuries, 80% resulted from collisions with heavier vehicles.

Statistics show that children aged 8-18 are the most affected by fatal injuries from electric scooter incidents. These incidents commonly occur on roadways, sidewalks, and bike paths. Research by the Austin Public Health Department (APX) in Austin, Texas, indicated that one-third of traffic incidents involving electric scooters occurred on sidewalks. Other sources report that 26.4% of electric scooter-related accidents happen on sidewalks.

Given the severity of these traffic accidents on sidewalks, bike paths, and roadways, there is a growing emphasis on preventive measures. This includes developing software for electric scooters to restrict where they can be ridden and implementing age restrictions for user registration, particularly for those using shared scooters.

In some countries, restrictions on electric scooter use are already in place. For example, in the Czech Republic, Finland, and Sweden, speed limits on sidewalks and bike paths are restricted to 25 km/h.

Results of the Study

Observations show numerous injury cases related to PMD use, but maxillofacial surgeons and trauma clinicians often do not focus on the cause of the injury, unlike forensic medical examiners. Analyzing data from scientific literature, authors identify the head as one of the most injury-prone and vulnerable areas.

Given that the head and skull protect the brain, injuries are categorized by severity: minor (surface epithelial damage), moderate (deep lacerations affecting the skin and muscles), severe (open and closed jaw fractures), and fatal (internal brain hemorrhages). For instance, G. Aulino and colleagues reported a case of a 33-year-old electric scooter rider who sustained a traumatic brain injury from a direct collision with a car. The injury involved fractures of the skull base and vault, subdural hematoma, and subarachnoid hemorrhage.

Head injuries account for 26-58% of PMD-related injuries, primarily due to the lack of protective gear, particularly helmets. Soft tissue injuries, such as lacerations and abrasions, frequently occur on the upper third of the face (forehead area), while fractures commonly affect the nasal bones, orbital bones, and upper jaw.

CONCLUSION

Based on the above discussion, it can be concluded that the use of electric scooters, categorized as personal mobility devices, poses extreme danger for children due to the vulnerability of their skulls at this age. Falls or collisions can lead to fatal outcomes. To reduce accidents associated with electric scooters, it is proposed to implement usage restrictions. This could be achieved by modifying the software so that users cannot operate scooters outside designated areas. If these boundaries are violated, scooters would automatically deactivate until returned to authorized zones. Additionally, there is a need to establish dedicated infrastructure for safe scooter movement to prevent collisions with pedestrians and other vehicles, which could otherwise result in tragic consequences.

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