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PEDIATRIC MECHANICAL TRAUMA: COMPOSITION AND CLINICAL IMPLICATIONS

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Abstract: *Pediatric trauma, particularly of mechanical origin, globally, presents a pervasive medical and social challenges. The incidence of such trauma, stemming from various causes including road traffic accidents and other environmental hazards, demands comprehensive investigation to elucidate its etiology, characteristics, clinical manifestations, and preventive strategies.*

Aim: This research endeavors to systematically explore the composition and medical dimensions of mechanical injuries occurring in pediatric populations.

Materials and Methods: A retrospective analysis was conducted utilizing data derived from forensic medical examinations (FME) conducted over a decade at the Samarkand Branch of the Republican Scientific and Practical Center of Forensic Medicine. These examinations were complemented by scrutiny of pertinent medical records, work materials, and registration journals.

Results and Discussion: During the investigation period, a total of 4894 cases of fatalities were examined, of which 361 involved children, with 173 cases (47.9%) associated with pediatric victims aged 17 and below. The occurrence of mechanical injuries among children exhibited temporal variation, with the lowest incidence recorded in 2013 (6.3%) and the highest in 2019 (9.9%). Among the 173 cases analyzed, 127 (73.4%) occurred at the scene of the incident or within the child's residence, while 46 (26.6%) were recorded in medical facilities. Age-wise distribution revealed 6 cases (3.4%) in the 1-5 age group, 57 (32.9%) in the 5-10 age group, 61 (35.2%) in the 10-14 age group, and 49 cases (28.3%) in the 14-17 age group. Gender distribution showed that 54.7% were male and 45.3% were female.

Mechanical trauma causes were predominantly attributed to road traffic accidents (77.9%), followed by various blunt force injuries (13.9%), falls from heights (5.2%), and crush injuries (3.5%). Road traffic accidents were the leading cause, with analysis indicating 14 cases involving bicycle accidents and 1 case involving a tractor accident, while the remaining 119 cases were attributable to automobile accidents. Further analysis by age and gender revealed that most victims (59.8%) involved in automobile accidents were male, with 7 cases (5.9%) occurring

in children aged 0-1, 28 cases (22.2%) in children aged 1-5, 48 cases (41%) in children aged 5-10, 25 cases (21.3%) in children aged 10-14, and 11 cases (9.4%) in children aged 14-17.

Among the various types of accidents, collisions with automobiles were the most prevalent bicycle-related injuries (84.2%), followed by accidents involving trucks (14.2%) and other modes of transportation (1.6%). The primary cause of fatalities (75.4%) in these accidents was severe head trauma, either open or closed.

Analysis of injuries due to falls revealed 5 cases of injuries occurring at the same level, 4 cases involving falls from heights of 4-5 stories, and 1 case involving falls from a height of 7-8 meters, as well as injuries resulting from burns, elevator shaft accidents, and falls into pits. Among the 12 cases analyzed, 7 occurred at the scene of the incident, while 5 were recorded in medical facilities. The majority of victims (79.8%) involved in falls were male.

The predominant causes of pediatric mechanical trauma were identified as severe head injuries and blunt abdominal trauma (40.5%), open head injuries and extensive anatomical disruptions (5.8%), pelvic and limb fractures (7.8%), injuries to vital organs and spinal cord (16.3%), extensive hemorrhage and shock (13.1%), and polyorganic trauma leading to fatality in hospital (7.1%).

These findings underscore the need for systematic investigations into the patterns and mechanisms of injuries, especially in cases of automobile accidents and falls from heights, to inform forensic-medical examinations aimed at medico-legal analysis. This highlights the necessity for further research on these topics that have not been fully explored and are not adequately addressed in scientific and literary works.

Conclusion: Forensic-medical examination data reveals that pediatric fatalities comprise 7.4% of the total fatalities, with 47.9% of these attributed to mechanical trauma. The primary causes identified within this demographic were road traffic accidents (77.9%), various blunt force injuries (13.9%), and falls from heights (5.2%). Notably, age stratification indicates an increase in incidents related to road traffic accidents as children transition into older age groups. These findings underscore the necessity for dedicated investigation into the forensic-medical aspects of these incidents.

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