SHOTA GELADZE, KETEVAN AKHOBADZE, NATO PITSKHELAURI,
NINO CHKHABERIDZE, NINO CHIKHLADZE

EPIDEMIOLOGICAL CHARACTERISTICS OF INJURIES ON THE EXAMPLE OF ONE HOSPITAL IN GEORGIA

Ivane Javakhishvili Tbilisi State University, Faculty of Medicine, Tbilisi, Georgia

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შოთა გელაძე, ქეთევან ახობაძე, ნატო ფიცხელაური, ნინო ჩხაბერიძე, ნინო ჩიხლაძე

ტრავმული დაზიანების ეპიდემიოლოგიური მახასიათებლების შესწავლა საქართველოს ერთი ჰოსპიტლის მაგალითზე

ივანე ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტი,
მედიცინის ფაკულტეტი, თბილისი საქართველო

რეზიუმე

ტრავმატიზმი მნიშვნელოვან გამოწვევას წარმოადგენს ჯანდაცვის სფეროში მსოფლიო მასშტაბით, თუმცა არაპროპორციულად მოქმედებს განვითარებად ქვეყნებზე. კვლევა მიზნად ისახავს საქართველოში ტრავმული დაზიანებების ეპიდემიოლოგიის შესწავლას, თბილისში არსებული ერთი საავადმყოფოს მაგალითზე. კვლევისთვის გამოყენებული იქნა რეტროსპექტული აღწერილობითი მეთოდი. გამოყენებული იქნა დაავადებათა კონტროლის ეროვნული ცენტრის 2022 წლის ბაზა, რომელიც მოიცავს ჰოსპიტალიზაციის მონაცემებს. ერთი წლის განმავლობაში სტაციონარული მკურნალობა ჩაუტარდა 1101 ტრავმული დაზიანების მქონე პაციენტს, რომელთაგან 709 (64%) იყო მამრობითი სქესის, ხოლო 392 (36%) - მდედრობითი სქესის. პაციენტთა ასაკი მერყეობდა 0-დან 92 წლამდე. მოდალური ასაკობრივი ჯგუფი იყო 10-19 წელი (n=184, 17%) და 20-25 წელი (n=146, 13%). ვარდნა არის ტრავმატიზმის გამომწვევი მთავარი მიზეზი ყველა ასაკობრივ ჯგუფში (n=844, 77%), როგორც კაცებში (n=544, 50%) ასევე ქალებში (n=300, 28%). მეორე ადგილზე არის დაუზუსტებელი ტრავმები (n=133, 12%), ხოლო მესამე პოზიციას იკავებს მოწამვლა (n=52, 5%). დაფიქსირდა 28 ფატალური შემთხვევა, სტაციონარში სიკვდილიანობის მაჩვენებელი იყო 2.5%. საავადმყოფოში დაყოვნების საშუალო ხანგრძლივობა იყო 3,17 დღე.

კვლევამ გამოავლინა მნიშვნელოვანი კავშირი ასაკს, დაზიანების ტიპს და მექანიზმს, საავადმყოფოში საწოლ დღეებსა და შედეგებს შორის. კვლევის შედეგები ხაზს უსვამს მონაცემთა შეგროვების და მონიტორინგის აუცილებლობას საქართველოში ტრავმების პრევენციის და მკურნალობის უფრო ეფექტური გზების შემუშავებისათვის. აღნიშნული კვლევა წარმოადგენს საბაზო კვლევას მომავალი კვლევის ჩასატარებლად, ტრავმული დაზიანებების ეპიდემიოლოგიური მახასიათებლებების სიღრმისეული შეფასებისა და საზოგადოებრივი ჯანდაცვის პრევენციული ინტერვენციების გაუმჯობესებისათვის.

Introduction. Traumatic injuries pose significant public health challenges worldwide, disproportionately affecting low- and middle-Income countries (LMICs). Each year, tens of millions of people experience non-fatal injuries, requiring medical attention from emergency departments, acute care facilities, hospitals, or general practitioners [1]. These injuries often lead to short-term or long-term disabilities, requiring continuous physical and mental health care, as well as rehabilitation [2,3]. LMICs have limited resources, inadequate infrastructure and insufficient access to health care facilities. In this case injuries often lead to long term disability, lost income and increased health care costs [4]. By understanding the epidemiology of traumatic injuries and implementing effective prevention and intervention strategies, we can strive to reduce the burden of these injuries and improve the health and well-being of individuals and communities worldwide.

Georgia, a country located at the crossroads of Europe and Asia, faces a significant burden of injuries that impacts the health and well-being of its population. The epidemiology of injuries in Georgia is characterized by a complex interplay of factors, including road traffic accidents, falls, violence and self-harm [5-7]. Understanding the patterns and trends of injuries in the country is crucial for developing effective prevention and intervention strategies. The study aims to explore the epidemiology of traumatic injuries in Georgia, based on one hospital in Tbilisi.

Methods. The retrospective descriptive method was used for the study - the 2022 database from the National Center for Disease Control and Public Health of Georgia, which encompasses hospital admissions. During the study period (01.01.2022-31.12.2022) cases of injury-related hospitalization were recorded on the example of one hospital located in capital city of Tbilisi, Georgia, with high admission rate of patients with injuries. The data were processed and analyzed through SPSS software using both descriptive and analytical statistical methods.

Results. The total number of patients was 1101, of which 709 were male and 392 were female. Injuries in males than females, are more frequent resulting in a male-to-female ratio of 1.8:1. According to the results, the highest rate of hospitalization was in the age group of 10-19 (N=184) and the lowest hospitalization rate was in the age group of 90+ (N=5). The ages of the patients ranged from 0 to 92 years. The modal age group was 10-19 years, accounting for 17% of the patients (n=184) with a standard deviation (SD) of 24.61. The most injured age group was 10-19 years, with a total of 184 patients (134 males and 50 females). 96% percent (n=1,060) of trauma patients live in urban areas, while 4% (n=41) live in rural areas. The majority of patients are from Tbilisi (n=642, 58%). Most of the cases were emergencies (n=965, 87%), while 13% (n=137) were planned. Fifty-one percent (n=561) of hospitalized patients were transported to the clinic by emergency medical services, 48% (n=523) were self-referrals, and 2% (n=17) were referred from other medical institutions.

The highest frequency of emergency medical services and self-arrival to the clinic was observed among patients aged 10-19 (Emergency Medical Center/Disaster Medical Center n=91, self-referral n=90). In most cases, unintended injuries were the main cause of hospitalization (n=933, 85%), followed by unspecified injuries (n=167, 15%). There was only one case of intentional injury, which was self-poisoning. The largest number of studied injuries occurred in spring (n=286, 26%), and the smallest in summer (n=254, 23%). The fewest cases of fatal traumatic injuries were recorded in autumn (4, 14%). In other seasons, 8-8 deaths were recorded equally. Falls were the leading mechanism of injuries in all age groups (n=844, 77%), both in men (n=544, 50%) and women (n=300, 28%). Followed by unspecified injuries (n=133, 12%), poisoning (n=52, 5%), medical complications (n=48, 4.3%), exposure to mechanical forces (n=15, 1.3%), vehicle accidents (n=8, 0.7%), and burns (n=1, 0.09%) were also observed.

Since Tbilisi has a burn center where all burn patients are hospitalized, we have only one case of a burn, which is a consequence of a medical procedure. The most common types of injuries were to the head (n=323, 29%), upper extremities (n=311, 28%) and lower extremities (n=198, 18%). In male patients, the injury was most pronounced in the upper extremities (n=229, 32%), head (n=193, 27%) and lower extremities (n=113, 16%). In female patients, the most common injuries were head trauma (n=130, 33%), lower extremities (n=85, 22%) and upper extremities (n=82, 21%). In patients aged 0-9 years, the main reasons for hospitalization were head injuries (n=47, 36%), upper extremity injuries (n=41, 31%) and poisoning (n=31, 24%). The most cases of traumatic injuries to the upper extremities were recorded in the 10-19 years age group (n=71, 22%).

Lower extremity injuries were most common in the 60-69 years age group (n=28, 16%) and unspecified injuries were most common in the same age group (n=31, 26%). In age categories under 60

years, head and upper extremity injuries were the leading causes of hospitalization, while in the 60+ age category, lower extremity injuries increased. 95% (n=1051) of hospitalized trauma patients, were discharged after completed treatment. 0.3% (n=4) were transferred to another medical facility, 2% (n=19) experienced stopped treatment and 2,5% (n=28) have died. The ages of those who died from traumatic injuries ranged from 21 to 87 years.

One-way Anova was used to calculate the statistical significance of the difference between the age groups regarding to hospitalization duration (total number of bed days). We had 10 age groups (1: 0-9; 2: 10-19; 3: 20-29; 4: 30-39; 5: 40-49; 6: 50-59; 7: 60-69; 8: 70-79; 9: 80-89; 10: 90+). According to the results there is a significant difference between groups ($p<0.01$, $F(9)=5.98$) (See table).

Age group 1 had significantly different (fewer) total number of bed days than age group 6 (M=-2.84; $p<0.01$), group 7 (M=-2.0; $p<0.05$), group 8 (M=-3.2; $p<0.01$) and group 9 (M=-3.05; $p<0.01$). From the results we also see significant difference between group 2 and group 6 (M=-2.14; $p<0.01$), group 8 (M=-2.77; $p<0.01$) and group 9 (M=-2.61, $p<0.01$). These results show that age group 2 had significantly fewer total number of bed days than group 6, 8 and 9. We do not see significant difference for age group 3, 4, 5 and 10. According to chi-square (X^2 (27)=77.8), which assess if there is a significant association between age groups and outcomes, $p<0.01$, meaning that there is a significant association, therefore treatment outcomes significantly differs between age groups.

Similarly, we used Chi square for the gender groups as well. According to the chi-square ($X^2(8)=1124$) there is a significant association between gender groups and outcomes ($p<0.01$).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	77.880[a]	27	.000
Likelihood Ratio	71.642	27	.000
N of Valid Cases	1101		

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1124.009[a]	8	.000
Likelihood Ratio	211.654	8	.000
N of Valid Cases	1122		

The findings of this study align with global trends, revealing a higher prevalence of injuries among males, with a male-to-female ratio of 1.8:1. This gender disparity is a common observation in injury epidemiology and is often attributed to differences in risk-taking behaviors, occupational hazards, and societal norms [8,9]. Additionally, societal expectations and gender roles may influence how males perceive and respond to risk, potentially leading to more reckless behavior [1]. The study also highlights the vulnerability of young people, particularly those aged 10-19 years, who accounted for the highest proportion of hospitalized injury cases. This finding is consistent with global data, which indicates that injuries are a leading cause of death and disability among young people worldwide [8].

Adolescence and young adulthood are often characterized by a propensity for risk-taking, experimentation, and a developing sense of invincibility, which can contribute to a higher incidence of injuries. Furthermore, young people may lack the experience and judgment necessary to navigate potentially dangerous situations safely. The predominance of falls as the leading mechanism of injury

across all age groups underscores the need for targeted prevention strategies to address this issue. Falls can result in severe consequences, such as fractures, head injuries, and even death, especially among older adults who may have underlying health conditions that make them more susceptible to complications [10]. However, falls are not exclusive to the elderly; they can occur at any age due to various factors, including environmental hazards, lack of attention, and underlying medical conditions.

Limitations of the study. While the study's focus on a single hospital in Tbilisi offers valuable insights into injury patterns, it's important to acknowledge that these findings may not be fully representative of the entire country. Tbilisi, as the capital city, may have different injury patterns compared to rural areas due to variations in population density, occupational hazards and access to healthcare. Furthermore, the study's reliance on hospital data inherently introduces a selection bias. The data only captures injuries that are severe enough to warrant hospitalization, leaving out a significant portion of less severe injuries that are treated in outpatient settings or not reported at all. This underestimation of the true burden of injuries in the community can hinder the development of comprehensive prevention and intervention strategies. To address this limitation, future research should consider incorporating data from various healthcare settings, including primary care clinics, emergency departments, and rehabilitation centers.

Conclusion. The results of this study provide us with important information about the types of injuries that require hospitalization in Tbilisi, Georgia. In addition, the study's findings underscore the need for better data collection and monitoring of injuries in Georgia. The insights gained from this study and future research can contribute to the development of evidence-based policies and practices that promote a safer and healthier environment for all residents of Georgia.

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SUMMARY

Traumatic injuries pose significant public health challenges worldwide, disproportionately affecting developing countries. The study aims to explore the epidemiology of traumatic injuries in Georgia, based on one hospital in Tbilisi. The retrospective descriptive method was used for the study - the 2022 database from the National Center for Disease Control and Public Health of Georgia, which encompasses hospital admissions. A total of 1101 patients were admited for an injury, of whom 709 (64%) were male patients and 392 (36%) were female patients. Patients' age ranged from 0 to 92 years. The modal age group was 10-19 years (n=184, 17%), followed by 20-25 years old (n=146, 13%). Falls were the leading mechanism of injuries in all age groups (n=844, 77%), both in men (n=544, 50%) and in women (n=300, 28%). Second was Unspecified injuries (n=133, 12%) and third poisoning (n=52, 5%). There were 28 fatal outcomes, with an in-hospital mortality rate of 2.5%. The mean hospital length of stay (LOS) 3,17. There was a significant association between age, type and mechanism of injury, hospital bed days and outcomes. The findings highlight the need for enhanced data collection and monitoring to develop more effective injury prevention and treatment strategies in Georgia. This research lays the groundwork for future studies to gain a deeper understanding of injury patterns and to improve public health interventions.

Keywords: Injury, hospitalization, epidemiological characteristics, Georgia