

Received: 14 January 2023 / Accepted: 11 February 2023 / Published online: 28 February 2023

DOI 10.34689/SH.2023.25.1.009

UDC 613.98

CLINICAL CHARACTERISTICS AND COST ANALYSIS OF GERIATRIC TRAUMATIC PATIENTS

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Abstract

Objective: It was aimed to evaluate the clinical features and costs of geriatric trauma patients.

Methods: A database of trauma patients over 65 admitted between January and December 2016 was constructed. Univariate analysis was performed. Measures of central tendency and dispersion for continuous variables were calculated. $p < 0.05$ value is accepted for statistically significantly.

Results: A total of 202 patients were analyzed, the mean age was 75.5 ± 8.1 years.

The 51.5% were women, and overall mortality was 0.5%. main mechanism of injury was falls. The median cost of the patients was USD 1251.98

Conclusions: In our hospital we found that geriatric trauma is a common disease, the main cause is falls are common in this population.

Keywords: Emergency, geriatric trauma, cost.

Резюме

КЛИНИЧЕСКИЕ ХАРАКТЕРИСТИКИ И АНАЛИЗ ЗАТРАТ НА ЛЕЧЕНИЕ ТРАВМ У ГЕРИАТРИЧЕСКИХ ПАЦИЕНТОВ

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Цель: Оценить клинические особенности течения и стоимость лечения травм у гериатрических пациентов.

Методы: была создана база данных пациентов с травмами старше 65 лет, поступивших в период с января по декабрь 2016 года. Был проведен одномерный анализ. Были рассчитаны меры центральной тенденции и дисперсии для непрерывных переменных. Значение $p < 0,05$ принято за статистически значимое.

Результаты. Всего было проанализировано 202 пациента, средний возраст которых составил $75,5 \pm 8,1$ года. 51,5% составляли женщины, а общая смертность составила 0,5%. Основным механизмом травмы было падение. Медианная стоимость лечения пациентов составила 1251,98 долларов США.

Выводы: в нашей больнице мы установили, что гериатрическая травма является распространенным заболеванием, основной причиной которого являются падения, распространенные в этой популяции.

Ключевые слова: неотложная помощь, гериатрическая травма, стоимость.

Түйіндеме

ГЕРИАТРИЯЛЫҚ НАУҚАСТАРДАҒЫ ТРАВМАТОЛОГИЯЛЫҚ КӨМЕКТІҢ КЛИНИКАЛЫҚ СИПАТТАМАСЫ ЖӘНЕ ЖҮРГІЗІЛГЕН ЕМНІҢ ҚҰНЫН ТАЛДАУ

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Мақсаты: Гериатриялық науқастардағы жарақатты емдеудің клиникалық барысын және құнын бағалау.

Әдіс-тәсілдері: 2016 жылдың қаңтар-желтоқсан аралығында қабылданған 65 жастан асқан жарақаттанған науқастардың мәліметтер базасы құрылды. Бір нұсқалы талдау жүргізілді. Үздіксіз айнымалылар үшін орталық тенденция мен дисперсия өлшемдері есептелді. $p < 0,05$ мәні статистикалық маңызды деп қабылданды.

Нәтижелер. Барлығы 202 науқас талданды, олардың орташа жасы $75,5 \pm 8,1$ жасты құрады. 51,5% әйелдер, жалпы өлім 0,5% құрады. Жарақаттың негізгі механизмі құлау болды. Пациенттерді емдеудің орташа құны 1251,98 АҚШ долларын құрады.

Қорытынды: Біздің ауруханада гериатриялық жарақаттардың жиі кездесетінін анықтадық, оның негізгі себебі осы популяцияда құлаудың жиілігі жоғары.

Түйін сөздер: шұғыл көмек, гериатриялық жарақат, шығын.

Bibliographic citation:

Engin M., Kavalci C., Celik K., Tekten B.-O. Clinical characteristics and cost analysis of geriatric traumatic patients // *Nauka i Zdravookhranenie* [Science & Healthcare]. 2023, (Vol.25) 1, pp. 74-78. doi 10.34689/SH.2023.25.1.009

Энгин М., Кавальчи Ч., Челик К., Тектен Б.-О. Клинические характеристики и анализ затрат на лечение травм у гериатрических пациентов // *Наука и Здравоохранение*. 2023. 1(Т.25). С. 74-78. doi 10.34689/SH.2023.25.1.009

Энгин М., Кавальчи Ч., Челик К., Тектен Б.-О. Гериатриялық науқастардағы травматологиялық көмектің клиникалық сипаттамасы және жүргізілген емнің құнын талдау // *Ғылым және Денсаулық сақтау*. 2023. 1 (Т.25). Б. 74-78. doi 10.34689/SH.2023.25.1.009

Introduction

The World Health Organization (WHO) defines 65 years and over as old, and 85 years and over as very old [1,2]. In our country, it is estimated that 12.2% of the population will be over the age of 65 in 2020 [2]. The increasing life expectancy brings with it many problems. As a result of the increase in the elderly population; many problems such as increasing number and severity of health problems, decreasing functional abilities, economic difficulties, changes in social status, loss of spouse and friends are observed [3].

In the geriatric population, injuries due to falling occur more frequently due to the factors brought by aging and the drugs used, and the severity of the damage may increase due to these factors [2,4]. Simple traumas that do not cause a serious lesion in young individuals may result in injuries that cause serious morbidity and mortality in the elderly [4]. In the elderly, following falls the frequency of injuries due to motor vehicle accidents and assaults was found to be high [5]. It has been stated that the increased frequency of traffic accidents, the inadequacy of the responses to the developing events and the increased comorbidity are related [2].

In addition to the increase in the number of elderly people, the frequency of geriatric trauma patients (GTP) who apply to emergency services is increasing with the physiological changes brought about by aging [1,5]. Patients over the age of 65 make up 11% of the patients admitted as a result of trauma, and this rate is expected to exceed 40% in the coming period [6]. As a result of falls, which is the most common cause of GTPs, orthopedic injuries and disabilities may occur, death may also occur due to major trauma [7,8]. Evaluation of elderly trauma patients is more difficult and complex compared to healthy young individuals. The evaluating trauma patients, patients should be evaluated with the characteristics of their own age groups [2,8].

In our study, it was aimed to evaluate the clinical features and costs of geriatric trauma patients.

Material and Method

Our study was carried out with the permission of the Ethics Committee (2017/74), by retrospectively evaluating trauma patients over the age of 65 who applied to the Emergency Department of Abant İzzet Baysal University in 2016.

Patients' age, gender, form of application, time of application (in hours and months), application complaint, cause of trauma, determined traumatic lesion and trauma site, trauma extent (isolated trauma, multitrauma), Glasgow Coma Scale (GCS), Revised Trauma Scale (RTS), diagnosis, outcome and cost analysis were evaluated.

Patients who had no trauma, whose data could not be accessed for any reason, or whose data were missing were excluded from the study. The cost calculation was made by converting the amount in the invoice issued to the social security institution to the dollar exchange rate dated 07.07.2017.

The data obtained in the study were evaluated with the SPSS (Statistical Package for Social Sciences) for Windows Version 22.0 package program. Continuous data were represented by mean±standart deviation, median and interquartile range (IQR), and qualitative data by number of cases (n) and percentage. Whether the continuous variables were normally distributed or not was tested with the Kolmogorov Smirnov test. Mann-Witney U test was used in the analysis of nonparametric data. A value of p<0.05 was considered statistically significant.

Results

The mean age of 202 patients included in the study was 75.5±8.1 years. In our study, 98 (48.5%) of the patients were male and 104 (51.5%) were female. In our study, 111 (55%) of the patients applied between 800-1600 hours, 77 (38.1%) patients between 1600-2400 hours and 14% between 2400-800 hours. The most frequent application was in July, the least application was in December (Figure 1).

The most common cause of trauma (76.8%) was falling, while the least cause of trauma was non-vehicle traffic accident (2.5%) (Figure 2).

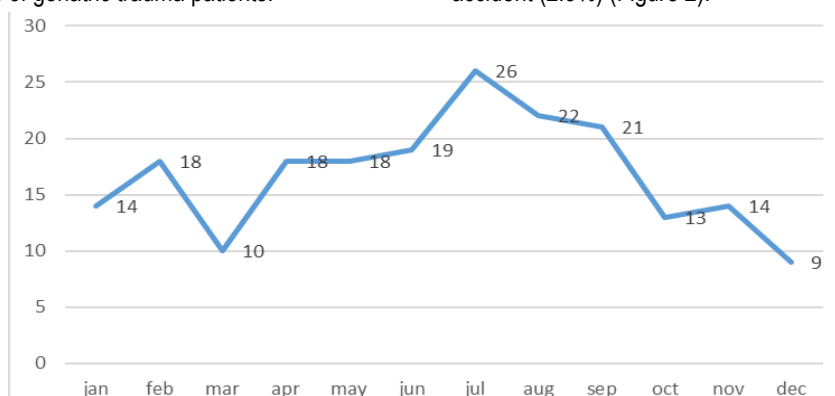


Figure 1. Distribution of patients by month.

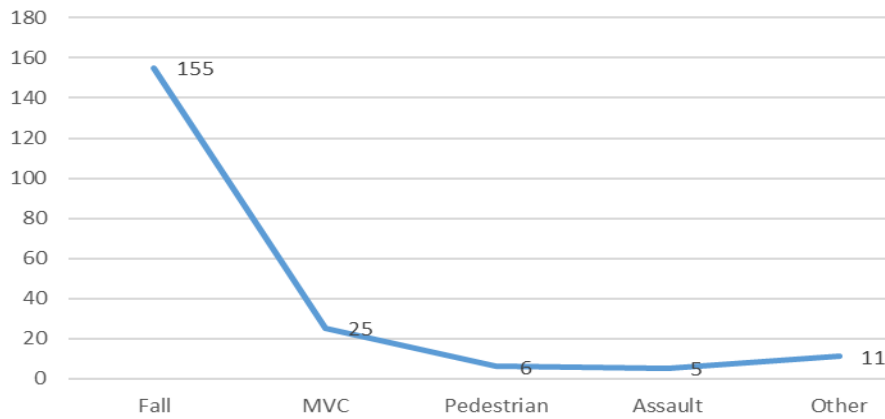


Figure 2. Cause of Trauma.

Of the patients, 186 (92.1%) were injured by isolated trauma, and 16 (7.9%) by multi-trauma and head trauma (29.7%) was the most common in the patients, and the least common was vertebra trauma (3.5%). (Table 1).

One (0.5%) of our patients had a GCS of 3 points, 1 (0.5%) of our patients had a GCS of 11 points, 4 (2.0%) had a GCS of 14 points, and 196 (97%) had GCS of 15 points. The RTS of 1 (0.5%) of the patients was 6.32 points, and the RTS of 201 (99.5%) patients was 7.84 points.

While 65.3% of our patients were discharged from the emergency department, 0.5% was exitus (figure 3).

Table 1.

Distribution of Injury area.

	n	%
Head	60	29.7
Thorax	36	17.8
Abdomen	10	5
Vertebra	7	3.5
Pelvis	45	22.3
Extremity	77	38.1

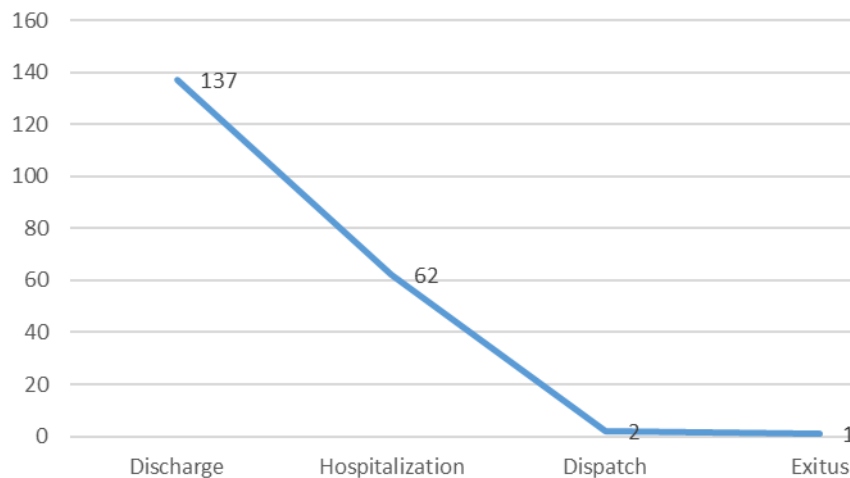


Figure 3. Patient Outcome.

The median cost of the patients was USD 1251.98, the median cost of the patients discharged from the emergency room was USD 43.38 (22.41), and the median cost of the hospitalized patients was USD 1214.44 (1396.35). The cost of hospitalized patients was higher than those discharged ($p < 0.05$).

Discussion

The increase in the geriatric population leads to an increase in the frequency of admission of these patients to the emergency services (9). Geriatric individuals are more frequently exposed to trauma as a result of lack of perception and attention, decrease in vision, decrease in mental/motor reserve, and postural disorders resulting from aging (10-12).

In studies conducted abroad in to GTPs, the mean of patients was reported to be 76-78 years (13-16). In studies

conducted in our country in to GTPs, it has been reported that the mean age is 74-76 years (17, 18). The mean age of our patients was 75.5 years, which was consistent with the literature. We are of the opinion that the frequency of trauma increases in advancing ages due to aging, comorbid diseases and drugs given for these diseases, indifference of elderly care staff, and impaired physiology.

While traumas are more common in the male population (1,2), GTs are more common in women (14, 15, 16, 19, 20). However, some authors have reported that GTs are more common in males (1, 20). Of our patients, 51% were women. The rate of our female patients may be higher because the life expectancy is higher in women than in men in our country.

When the admission times of the patients were examined, some authors reported that the most frequent admission was in the 08⁰⁰-16⁰⁰ time period (22-23), and

some authors in the 16⁰⁰-24⁰⁰ time period (92). In our study, the most frequent application was between 08⁰⁰-16⁰⁰ hours. In this time period, we believe that the most frequent application is during the daytime due to the fact that the elderly are more active, they cannot get help due to being alone at home, and elderly care staff careless behavior.

When the months in which the trauma occurred were examined, some authors reported that trauma was most common in the summer months (11,24), while some authors reported that it was seen in the autumn (21,25,26). We also saw that the most common trauma was in the summer months (most often in July). We are of the opinion that people spending more time outside the home in summer, and when at home spending time in high-risk places for the elderly, such as balconies, which increases frequency of trauma in summer.

When the literature is examined in terms of trauma mechanism, some authors reported that the most common cause was falls (8,16, 17), and some authors reported that traffic accidents (2,21). In our study, the most common cause of trauma was falls. Decreased visual acuity, decreased attention, prolongation of reaction time, systemic diseases and coordination disorders may facilitate falls in the geriatric population.

It has been reported that the most frequently exposed areas of trauma in the geriatric population are the extremities (11, 15,26). In our study, it was determined that the most frequently injured areas were the extremities. We are of the opinion that the lower extremities are frequently injured due to direct trauma caused by simple falls, and the upper extremities are frequently injured due to hitting the ground for defensive purposes to slow down the fall.

Akturk et al. reported that 98.4% of the patients had a good GCS, 1.1% had a moderate GCS and 0.5% had a poor GCS (27). Kandis et al. they stated that the mean GCS in GTDs was 14.5 (28). The GCS of 97% of our patients was 15 and the RTS of 99.5% was 7.84. We are of the opinion that the scores were mostly normal because the patients were exposed to isolated trauma due to falling.

When the geriatric trauma literature was examined according to patient outcome, it was reported that the majority of the patients were discharged and the mortality rate was between 0.4-3.6% (11,16,17, 26,29). In our study, the rate of discharge from the emergency service was 65.3% and the mortality rate was 0.5%. Our results are compatible with the literature. Our mortality rate may have remained low, as most of our patients had low-energy trauma from falls.

When the cost of geriatric trauma patients was examined, figures ranging from \$24.47 to \$2069 were reported (30-35). We found that the median cost of patients was \$1254.7. We are of the opinion that due to the patients being elderly and their fragility, physicians request more examinations, and the need for more surgery, prosthesis and intensive care in the treatment of detected fractures, thus increasing patient costs.

Conclusion

We have seen that geriatric traumas are more common in women, the most common injury is in the extremities, the mortality rate is low and the cost is high.

Limitations

The most important limitations of the study are that it is retrospective and single-centered.

This study was presented on 9. Asian Conference on Emergency Medicine. 13. Turkish Emergency Medicine Congress. 22-25 November 2017, Antalya, Turkey.

Author Contributions. All the authors took peer part in writing the article.

Conflicts of Interest: The authors declare no conflict of interest.

Funding: This research received no external funding.

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