



Evaluation of Older Geriatric Patients Consulting the Thoracic Surgery Clinic from the Emergency Department During COVID-19

COVID-19 Sürecinde Acil Servisten Göğüs Cerrahisi Kliniğine Başvuran Yaşlı Geriatri Hastalarının Değerlendirmesi

Suleyman Anil Akboga¹, Merve Hatipoğlu¹, Anil Gokce¹, Yucel Akkas¹, Hakan Oguzturk², Bülent Kocer¹

¹Department of Thoracic Surgery; ²Department of Emergency Medicine, Ankara City Hospital, Ankara, Türkiye

ABSTRACT

Aim: This study was designed to examine the applications of geriatric patients aged 80 and over to emergency service for trauma and non-traumatic reasons and to evaluate the relationship between those findings and the restrictions applied due to the COVID-19 pandemic.

Material and Method: A total of 111 patients over the age of 80, including 49 patients who were directed from the emergency room to thoracic surgery due to thoracic trauma and 62 patients who were referred to thoracic surgery for non-traumatic reasons, were included in the study between March 2020 and March 2021.

Results: During the pandemic period in question, it was found that female patients were admitted to the emergency department due to trauma statistically significantly more often while male patients were more often admitted to the emergency department for non-traumatic reasons ($p=0.021$). It was furthermore found that 22 (44.9%) of the 49 patients who presented with trauma were hospitalized, while 10 (16.1%) of the 62 patients who presented for non-traumatic reasons were hospitalized ($p=0.001$).

Conclusion: We know that the course of disease of many patients, especially patients with malignancies, continues to progress with the frequent occurrence of chronic diseases or diseases with asymptomatic and progressive characteristics in the geriatric population. At the same time, pandemic restrictions may cause difficulties in reaching the hospital. For this reason, we advise that the geriatric population, especially older geriatric patients, not delay hospital visits in the face of any other pandemic-related restrictions that may be applied. The general public should also be made aware of this issue. Otherwise, the social inactivity imposed as a result of such pandemic-related restrictions may increase the mortality rate among geriatric patients due to chronic diseases or neoplasias far beyond the mortality rate that occurs due to the pandemic itself.

Key words: geriatrics; covid-19; pandemic; thoracic trauma

ÖZET

Amaç: Bu çalışmada pandemi sürecinde 80 yaş ve üstü geriatric hastaların travma ve travma dışı sebeplerle acil servise başvurularının incelenmesi ve çıkan sonuçların, pandemi sebebiyle uygulanan kısıtlamalar ile ilişkisinin değerlendirilmesi amaçlanmıştır.

Materyal ve Metot: Çalışmaya Mart 2020-Mart 2021 tarihleri arasında 80 yaş üstü toraks travması sebebiyle acil servisten göğüs cerrahisine danışılan 49 hasta ile travma dışı sebeplerle göğüs cerrahisine danışılan 62 hasta olmak üzere toplam 111 hasta dahil edilmiştir.

Bulgular: Söz konusu pandemi döneminde kadın hastaların istatistiksel olarak anlamlı derecede daha sık travma nedeniyle acil servise başvurdukları, erkek hastaların ise travma dışı nedenlerle acil servise daha sık başvurdukları saptandı ($p=0,021$). Pandemide travma ile başvuran 49 hastanın 22'sinin (%44,9), travma dışı nedenlerle başvuran 62 hastanın 10'unun (%16,1) hastanede yattığı saptandı ($p=0,001$).

Sonuç: Geriatrik nüfusta, kronik hastalıkların veya malignite gibi asemptomatik seyredip ilerleyici karakterdeki hastalıkların sık görülmesi ve pandemik kısıtlamaların hastaneye ulaşmada sıkıntı yaratması sebebiyle başta malignite hastaları olmak üzere birçok hastanın evrelerinin ilerlediğini biliyoruz. Bu sebeple bundan sonra meydana gelebilecek başka pandemi süreçlerini yönetirken geriatrik nüfusun (özellikle ileri yaş geriatric hastaların) hastaneye başvurularını geciktirmemeleri gerektiğini ve bu hususta halkın bilinçlendirilmesi gerektiğini düşünüyoruz. Aksi takdirde gelişebilecek başka pandemilerde, geriatric hastalara uygulanacak kısıtlamalar sonucunda toplumsal hareketsizliğin (kronik hastalıklar veya neoplazmi hastalarının hastaneye ulaşmadaki gecikmeleri sebebiyle) mortaliteyi, pandeminin meydana getirdiği mortaliteye göre çok daha fazla artırabileceğini düşünüyoruz.

Anahtar kelimeler: geriatri; covid-19; pandemi; toraks travması

İletişim/Contact: Suleyman Anil Akboga, Ankara Şehir Hastanesi Göğüs Cerrahisi Kliniği, Ankara, Türkiye • **Tel:** 0506 905 92 55 • **E-mail:** doktor_anil_@hotmail.com • **Geliş/Received:** 30.03.2022 • **Kabul/Accepted:** 22.06.2022

ORCID: Süleyman Anil Akboğa, 0000-0001-5400-7652 • Anil Gökçe, 0000-0002-9134-521X • Merve Hatipoğlu, 0000-0003-3660-9507 • Yücel Akkaş, 0000-0002-4432-2832 • Hakan Oğuztürk, 0000-0002-9800-1428 • Bülent Koçer, 0000-0002-7344-9859

Introduction

The COVID-19 pandemic, caused by the SARS-CoV-2 coronavirus, led to a global crisis with its impact on human life in 2020¹. Since the beginning of the pandemic, all possible human and material resources in hospitals have been used to combat COVID-19². For this reason, various restrictions have been applied to use hospital resources more effectively and to reduce both the transmission of COVID-19 infection among people and the hospital load due to the pandemic. Many restrictions during the pandemic have been aimed at protecting the geriatric population from the virus. A curfew was applied in Türkiye to the segment of the population aged ≥ 65 throughout most of the pandemic. As a result of these policies, there has been a significant decrease in the admission of geriatric patients to the hospital. This study aimed to evaluate geriatric patients aged ≥ 80 who presented to emergency services for treatment in thoracic trauma and non-traumatic thoracic surgery clinics and compare those findings with the literature.

Materials and Methods

A total of 111 patients over the age of 80, including 49 patients who were directed from the emergency room to thoracic surgery due to thoracic trauma and 62 patients who were directed to thoracic surgery for non-traumatic reasons, were included in the study between March 2020 and March 2021. The data of the included patients were obtained by retrospectively scanning the hospital's information management system. The reasons for the admission of the patients were obtained by examining the records of consultations sent to our clinic. Patients were grouped according to the dates they presented to the emergency department. The relationship between COVID-19 waves and patients' admissions to the emergency department was statistically evaluated.

Statistical Method

Statistical analyses were performed using IBM SPSS Statistics for Windows 22.0 (IBM Corp., Armonk, NY, USA). Numerical variables were expressed as means \pm standard deviations and medians (minimums-maximums), and categorical variables were expressed as numbers and percentages. Parametric test assumptions (normality and homogeneity of variance) were checked before the groups were compared in terms of numerical variables. The differences between the groups were examined using t-tests for dependent groups. Categorical values were analyzed with the Fisher exact test. Mann-Whitney U and Kruskal-Wallis tests were used to compare continuous variables. Values of $p < 0.05$ were accepted as statistically significant for all analyses.

Results

In the first 12 months of the COVID-19 pandemic, 10621 consultations were sent to our thoracic surgery clinic, 2879 (27.1%) of which originated from emergency services. Of those 2879 consultations sent from the emergency department, 111 (3.85%) cases involved patients aged ≥ 80 years. While 49 (44.5%) of those patients presented to the emergency department due to thoracic trauma, 62 (55.5%) presented for non-traumatic reasons. Fifty-nine (53.2%) of these patients were male, and 52 (46.8%) were female. Of the patients presenting with trauma, 29 (59.2%) were female, and 20 (40.8%) were male, while 39 (62.9%) of the patients presenting for non-traumatic reasons were male and 23 (37.1%) were female. During the pandemic period, it was found that female patients were admitted to the emergency department due to trauma statistically significantly more often, while male patients were more often admitted to the emergency department due to non-traumatic reasons ($p=0.021$). However, men were more likely to present to the emergency department due to trauma during non-pandemic times. The mean age of the patients was 85.46 ± 4.62 (range: 80–99) years ($p=0.711$). Among trauma cases, 44 (39.6%) of the patients had presented due to falling, 4 (3.6%) due to traffic accidents, and 1 (0.9%) due to assault. Among the patients who presented for non-traumatic reasons, the most common reason was pleural effusion in 44 (37.8%) cases, followed by a mixture of other more rare reasons (lung abscess, pneumomediastinum, malignancy, pneumothorax, control visits) in 18 (16.2%) cases. For 24 (54.6%) of the patients who presented with pleural effusion, the etiology was a factor causing transudative pleural fluid, while for 20 (45.4%), the etiology was a factor causing exudative pleural fluid. The etiology was loculated empyema for 10 (22.7%) patients with exudative pleural effusion samples and malignant effusion for 10 (22.7%) patients. Of the patients who presented for non-traumatic reasons, 48 (77.4%) presented with dyspnea, 5 (8.1%) had a poor general condition, 4 (6.5%) had cough, 3 (4%) had chest pain, 1 (1.6%) had hematemesis, and 1 (1.6%) had been unable to obtain an outpatient appointment. The most common pathological finding in trauma cases was rib fracture in 40 (81.6%) patients. Tube thoracostomy was applied for 5 (10.2%) patients due to post-traumatic hemothorax or pneumothorax. Patients who presented to the emergency department were evaluated according to whether they were treated in the thoracic surgery service or were followed without hospitalization after being assessed in the emergency department. Accordingly, 22 (44.9%) of the 49 patients who presented with trauma were hospitalized. In comparison, 10 (16.1%) of the 62 patients who presented for non-traumatic reasons were hospitalized, and this result was statistically

significant ($p=0.001$). In March-June 2020, when the first wave of the COVID-19 pandemic was observed in Türkiye, 12 patients presented due to trauma and five patients due to non-traumatic reasons. In September-December 2020, when the second wave was seen, 17 patients presented due to trauma and 24 patients due to non-traumatic reasons. Fifty-three patients presented in July-August 2020 and January-March 2021, when restrictions were relaxed after the pandemic waves. Of the 53 patients who presented during those periods, 33 presented for non-traumatic reasons, and 20 presented due to trauma ($p=0.054$).

Discussion

COVID-19, triggered by infection with the human pathogenic coronavirus SARS-CoV-2, was first identified in China at the end of December 2019 and was declared a pandemic by the World Health Organization in March 2020 due to its global spread³. As of March 11, 2020, when the first case was seen in Türkiye, various restrictions began to be implemented here. As of March 21, 2020, for example, a curfew was imposed on citizens over the age of 65. Restrictions for the geriatric population continued until the effective introduction of COVID-19 vaccines. For this reason, there were some changes in the presentations of the geriatric population to the hospital during this period.

While it is to be expected that patients presenting to the emergency department due to thoracic trauma are mostly male, in our study, it was found that 29 (59.2%) female patients and 20 (40.8%) male patients applied to the emergency department due to thoracic trauma. Thus, women were more likely to apply to the emergency department with trauma numerically and proportionally. We think that the reason for this was the curfew that was in place during the pandemic period, with women working more at home with more active home lives. For non-traumatic thoracic surgery, 39 (62.9%) male patients and 23 (37.1%) female patients presented to the emergency services. Both numerically and proportionally, males were more likely to present to the emergency department for non-traumatic reasons. We think this is because men had more sedentary home lives than women throughout the pandemic restrictions.

Table 1 shows that the reasons among the geriatric population over the age of 80 for presenting to the hospital for thoracic surgery also changed moving forward from March 2020, when the pandemic started, to February-March 2021, when COVID-19 vaccines began to be administered effectively. Although admissions due to trauma and non-traumatic reasons were very rare at the beginning of the pandemic, emergency service applications increased in the following periods with the

relaxation of restrictions and the start of COVID-19 vaccine administration. In a study conducted in Germany, although the average daily number of patients who presented to the hospital's emergency clinic was 131 as of February 2020, it decreased to 88 patients per day as of March 2020, at the start of the pandemic⁴. It was similarly observed that the number of patients presenting to the emergency department in the same clinic and requiring surgery secondary to trauma decreased considerably compared to the number of patients who required conservative treatment, and the authors stated that the reason for this was the curfew applied in Bavaria due to the pandemic⁵.

Other researchers reported that although the number of hospital admissions due to injury decreased in the United States due to social distancing and other restrictions, the rate of penetrating traumas increased among all trauma cases^{6,7}. In our study, as shown in Table 2, the number of patients presenting to the emergency services decreased during the major pandemic waves. The restrictions were designed for the segment of the population over 65 years of age.

In a study of 400 patients aged 65–100 years in which etiologies were evaluated for geriatric patients who presented to the emergency department due to trauma, it was found that 314 (78.5%) of the patients had presented after falling⁸. In our study, the etiological reason was falling for 44 (89.8%) of the 49 patients (89.8%) in the emergency department due to thoracic trauma in the first 12 months of the pandemic. Falling was the most common cause of trauma in the geriatric population during this period, in line with the literature. In a study conducted in England, 220000 applications were made to emergency services due to geriatric trauma between 2017 and 2018⁹. In our study, 49 (1.7%) of 2879 thoracic surgery consultations coming to our clinic from the emergency department during the pandemic were due to thoracic trauma in geriatric patients over the age of 80.

Rib fractures after chest trauma increase mortality in the geriatric population by two times compared to the younger population¹⁰. In our study, 40 of 49 patients who presented due to trauma had rib fractures. Other researchers found the mortality rate to be 20.1% in the geriatric population with rib fractures^{10,11}. In our study, mortality was observed for 9 (22.5%) of the 40 patients who had rib fractures, and our data are consistent with the literature.

When we evaluated the hospitalization rates after admission to the emergency department, it was found that 22 (44.9%) trauma patients and 10 (16.1%) patients who presented with non-traumatic reasons were hospitalized in our clinic. We think that the most important reason for the low hospitalization rates of patients

Table 1. Evaluation of demographic and clinical characteristics of the patients

Variables		Thoracic trauma		Non-traumatic reasons		p-value
		N	%	N	%	
Gender	Male	20	40.8	39	62.9	0.021
	Female	29	59.2	23	37.1	
Age (year) (Mean ± Std)		85.65±4.56		85.32±4.71		0.711
CCI	0–7	33	67.3	36	58.1	0.317
	8–15	16	32.7	26	41.9	
CCI (Mean ± Std)		6.59±2.01		7.01±1.27		0.180
To the emergency room status after application	Discharge	27	55.1	52	83.9	0.001
	Admission	22	44.9	10	16.1	
Mortality	Yes	9	18.4	4	6.5	0.053
	No	40	81.6	58	93.5	

N: Number, CCI: Charlson Comorbidity Index, Std: Standard deviation.

Table 2. Evaluation of patients' reasons for applying to the emergency department according to pandemic attacks

Variables		Thoracic trauma		Non-traumatic reasons		p-value
		N	%	N	%	
Pandemic 1st attack application (March-June 2020)		12	24.5	5	8.1	0.054
Pandemic 2nd attack application (September-December 2020)		17	34.7	24	38.7	
Period after attacks (July-August 2020, January-March 2021)		20	40.8	33	53.2	
Causes of thoracic trauma	Fall	44	89.8			
	Traffic accident	4	8.2			
	Minting	1	2			
Causes of non-traumatic reasons	Pleural effusion			44	70.9	
	Other (lung abscess, pneumomediastinum, malignancy, pneumothorax, control)			18	29.1	
Symptoms of non-traumatic reasons	Dyspnea			48	77.4	
	Cough			4	6.5	
	General condition Disorder			5	8.1	
	Control			3	4.8	
	Hematemesis			1	1.6	
	Chest pain			1	1.6	

presenting for non-traumatic reasons is that our hospital is the largest pandemic hospital in Türkiye and Europe, and recommended hospitalizations for asymptomatic complaints are often refused by patients or their relatives due to fear of COVID-19 exposure.

Another study stated that rib fixation should not be applied to patients over 80 years of age because osteoporosis would not be successful in this age group due to osteoporosis¹¹. In our study, rib fixation was not applied for patients over the age of 80 who had rib fractures, and conservative treatment was preferred.

When the literature is examined, a significant decrease is observed in outpatient and emergency service applications during the pandemic period^{12,13}. In a study by Barten et al.¹⁴ in the Netherlands in 2020 examining the emergency services of three hospitals not related to COVID-19, they reported a 66% decrease compared to 2019. In our study, when our patients' presentations to the emergency department for thoracic surgery were

evaluated, it was seen that 5 (8.1%) patients presented in the first wave of the pandemic, 24 patients (38.7%) shown in the second wave, and 33 patients (53.2%) presented outside of those two periods. Although the pandemic continues, the number of trauma patients admitted to the emergency department has remained numerically proportional in every period. In contrast, presentations for non-traumatic reasons have increased gradually. We think the main points affecting this finding are that the vaccination program has begun, restrictions were reduced due to vaccinations, and the fear of contagion has been reduced by trust in vaccines.

Limitations of the Study

The main limitations of this study are its retrospective nature, the fact that it was conducted at a single center, the small number of patients due to the limited age range, and the inability to perform a long-term survey analysis due to the recent period being considered.

Conclusion

We know that the disease course of many patients, especially patients with malignancies, continues to progress with the frequent occurrence of chronic diseases or diseases with asymptomatic and progressive characteristics in the geriatric population. At the same time, pandemic restrictions may cause difficulties in reaching the hospital. For this reason, we advise that the geriatric population, especially older geriatric patients, not delay hospital visits in the face of any other pandemic-related restrictions that may be applied. The general public should also be made aware of this issue. Otherwise, the social inactivity imposed as a result of such pandemic-related restrictions may increase the mortality rate among geriatric patients due to chronic diseases or neoplasias far beyond the mortality rate that occurs due to the pandemic itself.

Ethics Committee Approval

Approval for this study was obtained from the local ethics committee (Date: 23.06.2021, No: E1-21-1864).

Conflict of Interest

The authors declare that there are no conflicts of interest.

References

1. Li Q, Xuhua G, Peng W. "Early transmission dynamics in Wuhan." China, of Novel. 2020;382(13):1199–1207.
2. Rosenbaum L. Facing Covid-19 in Italy-Ethics, Logistics, and Therapeutics on the Epidemic's Front Line. *New England Journal of Medicine*. 2020;382(20):1873–1875.
3. World Health Organization. Declaration by the Director General of WHO on the IHR Emergency Committee meeting on the Novel Coronavirus(2019-nCoV). 2020.
4. Tschaikowsky T, Becker von Rose A, Consalvo S, Pflüger P, Barthel P, Spinner CD, et al. Numbers of emergency room patients during the COVID-19 pandemic. *Notfall & Rettungsmedizin*. 2020;1–10.
5. Bavarian State Ministry for Health and Care. Announcement of March 20, 2020, implementation of the Infection Protection Act (IfSG)- provisional exit restriction on the occasion of the corona pandemic, Az. Z6a-G8000–2020:122–198.
6. Bank M, O'Neill P, Prince J, Simon R, Teperman S, Winchell R. Early report from the greater New York chapter of the American College of Surgeons Committee on Trauma on the COVID-19 crisis. 2020.
7. Ranney ML, Griffeth V, Jha AK. Critical supply shortages the need for ventilators and personal protective equipment during the Covid-19 pandemic. *N Engl J Med*. 2020;382(18):e41.
8. Özdemir S., Köse S. Thoracic trauma and mortality in geriatric Turkish population:6-month follow-up study. *Gen Thorac Cardiovasc Surg*. 2020;69:504–510.
9. National Office of Clinical Audit. C2019. Major Trauma Audit National Report 2016.
10. Stawicki SP, Grossman MD, Hoey BA, Miller DL, Reed JF. Rib fractures in the elderly: an indicator of injury severity. *J Am Geriatr Soc*. 2004;52:805–808.
11. Marasco SF, Davies AR, Cooper J, Varma D, Bennett V, Nevill R, et al. Prospective randomized controlled trial of operative rib fixation in traumatic flail chest. *Journal of the American College of Surgeons*. 2013;216(5):924–932.
12. Ojetti V, Covino M, Brigida M, Petruzzello C, Saviano A, Migneco A et al. Non-COVID diseases during the pandemic: where have all other emergencies gone? *Medicina*. 2020;56(10):512.
13. Oseran AS, Nash D, Kim C, Moisuk S, Lai PY, Pyhtila J, et al. Changes in hospital admissions for urgent conditions during COVID-19 pandemic. *Am J Manag Care*. 2020;26(8):327–328.
14. Barten DG, Latten GH, Van Osch FH. Reduced emergency department utilization during the early phase of the COVID-19 pandemic: viral fear or lockdown effect? *Disaster Med Public Health Prep*. 2020:1–4.