

ORIGINAL ARTICLE

The effect of COVID-19 pandemic on the number of patients in burns services

Saygın Altınır¹  | Salih Tuncal¹  | Yılmaz Ünal¹  | Mert Çöl¹  |
Çağrı Büyükkasap²  | M. Recep Pekcici¹ 

¹Department of General Surgery, Ankara Training and Research Hospital, Ankara, Turkey

²Department of General Surgery, Gazi University Faculty of Medicine, Ankara, Turkey

Correspondence

Çağrı Büyükkasap, Department of General Surgery, Gazi University Faculty of Medicine, Ankara, Turkey.
Email: cagribk@gmail.com

Abstract

This study was conducted to examine the effects of the coronavirus disease 2019 (COVID-19) pandemic on the epidemiological characteristics and causes of burns in patients admitted to burns services. A total of 629 patients who applied to the burn center of our hospital on March 11 to June 11, 2019, and March 11 to June 11, 2020, were included in this single-center, retrospective study. The demographic information of the patients, causes of burns, burn degrees, affected anatomical areas, admission times and burn surface areas were recorded retrospectively according to patient records. The findings of our study suggest that gender, age, causes of burns, affected anatomical areas and application times did not differ before and after the COVID-19 pandemic. The number of cases has significantly decreased during the COVID-19 pandemic compared with that of the previous year. As a result, burn trauma is an emergency; it is preventable and cannot be ignored. The COVID-19 pandemic has had many effects on social, cultural and economic fields, as well as on the field of health.

KEYWORDS

burn injury, burn services, COVID-19, pandemic

Key Messages

- in our study, in which the effect of the COVID-19 pandemic on patients who applied to the burn outpatient clinic was investigated, it was observed that there was no change in burn types, formation patterns and application times, despite the decrease in the number of applications
- burn; it is an emergency, preventable and cannot be ignored
- individual precautions and attention contribute to the reduction of mortality and morbidity caused by burns

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *International Wound Journal* published by Medicalhelplines.com Inc (3M) and John Wiley & Sons Ltd.

1 | BACKGROUND

Burn injury is one of the top 10 causes of trauma globally.¹ It is a trauma that can happen at any age and result in serious multiple organ failure or death. Today, the increase in the number of burn centres and the establishment of multidisciplinary units that deal specifically with burns have contributed to reducing mortality and morbidity rates related to burns.² Age, socioeconomic and cultural levels and living conditions play an important role in the occurrence of burns. 90% of all burns are caused by carelessness and neglect, and most are preventable.³

COVID-19 first emerged in the city of Wuhan, China in December 2019, was declared a pandemic and caused the death of millions of people around the world. The effect of this pandemic, which is still ongoing, on the treatment process of burn patients has not yet been clearly understood. In the first days of the pandemic, education activities were suspended in Turkey, flexible working schedules were introduced in non-essential work fields and a curfew was imposed on some days.

2 | AIM

In this study, the effect of the COVID-19 pandemic, which has affected all areas of life, on burn cases has been examined.

3 | METHODS

In our study, a total of 629 patients who applied to Ankara Training and Research Hospital burn center between March 11-June 11, 2019 and March 11-June 11, 2020 were analysed, retrospectively, through hospital records. Taking the date of March 11, 2020, as a basis when the first COVID-19 case was seen in our country, the patients were divided into two groups as those who applied to the hospital before the pandemic and during the pandemic. The demographic information of the patients, the formation of the burn, the location and degree of the burn and the total burned body surface areas were recorded. The ages of the patients were categorised as 0 to 12 years, 13 to 18 years, 19 to 59 years and 65+ years. The anatomical localisation of the burns was divided into eight groups as head-neck, trunk in addition to head-neck, one extremity, two or more extremities, extremity in addition to the trunk, gluteus and perineum. The causes of burns were examined under six headings as scalding (hot liquid, oil, water), flame, chemical, contact, electricity and sun. Due to the low number of patients who applied to our burn center between the pre-pandemic and post-pandemic periods, patients with sun

and electricity burns were not included in the statistical analysis. Burn surface area was calculated by the Lund-Browder method. The research was carried out with the permission obtained from Ankara Training and Research Hospital Scientific Research Board (E-21-759).

4 | STATISTICAL ANALYSIS

For the statistical analysis of the research data, Statistical Package for Social Sciences (SPSS), version 23.0 for Windows (SPSS Inc., Chicago, IL) computer package program was used. In the descriptive statistics section, categorical variables are presented with numbers and percentages, and continuous variables are presented with mean + standard deviation and median (smallest-maximum value). Conformity of continuous variables to normal distribution was analysed with visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Chi-square and Mann Whitney *U* tests were used for comparison analyses. The level of significance in the study was accepted as $P < .05$.

5 | RESULTS

In this study investigating the effect of the COVID-19 pandemic on burn patients, the information of 629 patients who applied on the specified dates was examined retrospectively. When the data of 2020 are examined, the time when the COVID-19 pandemic was at its peak, 171 (27.2%) patients were included in the study, with 91 (53.2%) male and 80 (46.8%) female patients. When burn patients are divided according to age groups, 36 (21.1%) patients are between the ages of 0 and 12 years, 11 (6.4%) are between ages 13 and 18 years, 117 (68.4%) are between 19 and 59 and 7 (4.1%) are 60 years or above. When the type of burns was examined, scalding was seen in 133 (77.8%) patients, flame in 13 (7.6%) patients, contact in 12 (7%) patients, chemical burns in 6 (3.5%) patients, electrical injuries in 4 (2.3%) patients and sunburn in 3 (1.8%) patients. The anatomical localisation of the patients was divided into 8 groups, and when analysed according to these groups, 14 (8.2%) patients had a burn on the head and neck area, 6 (3.5%) patients on the trunk in addition to the head and neck, 107 (62.6%) on one extremity, 25 (14.6%) in two or more extremities, 10 (5.8%) in the trunk and 6 (3.5%) in the extremity in addition to the trunk, 2 (1.2%) in the gluteus and in 1 (0.6%) in the perineum. When the burn degrees were examined, 5 (2.9%) patients had 1st degree burns, 163 (95.3%) had 2nd degree burns and 3 (1.8%) had 3rd degree burns.

TABLE 1 Characteristics of patients who applied to the burn service at the specified times

	2019		2020		Total	
	Number	(%) ^a	Number	(%) ^a	Number	(%) ^a
Age groups (n = 629)						
0-12	124	27.1	36	21.1	160	25.4
13-18	42	9.2	11	6.4	53	8.4
19-59	270	59.0	117	68.4	387	61.5
≥60	22	4.8	7	4.1	29	4.6
Causes of burns (n = 629)						
Scalding	356	77.7	133	77.8	489	77.7
Flame	18	3.9	13	7.6	31	4.9
Chemical	21	4.6	6	3.5	27	4.3
Contact	51	11.1	12	7.0	63	10.0
Electricity	1	0.2	4	2.3	5	0.8
Sun	11	2.4	3	1.8	14	2.2
Burn degree (n = 629)						
1st degree	33	7.2	5	2.9	38	6.0
2nd degree	418	91.3	163	95.3	581	92.4
3rd degree	7	1.5	3	1.8	10	1.6
Gender (n = 629)						
Female	225	49.1	80	46.8	305	48.5
Male	233	50.9	91	53.2	324	51.5

^aColumn percentage.**TABLE 2** Comparison of patients admitted to our burn center between the pre-pandemic and post-pandemic periods according to age groups, burn degree, causes of burns and gender characteristics

	2019	2020	<i>P</i>
	n (%) ^a	n (%) ^a	
Age groups (n = 629) <i>P</i> = .184 ^b			
0-12	124 (27.1%)	36 (21.1%)	
13-18	42 (9.2%)	11 (6.4%)	
19-59	270 (59.0%)	117 (68.4%)	
≥60	22 (4.8%)	7 (4.1%)	
Causes of burns (n = 610) <i>P</i> = .118 ^b			
Scalding	356 (79.8%)	133 (81.1%)	
Flame	18 (4.0%)	13 (7.9%)	
Chemical	21 (4.7%)	6 (3.7%)	
Contact	51 (11.4%)	12 (7.3%)	
Burn degree (n = 629) <i>P</i> = .133 ^b			
1st degree	33 (7.2%)	5 (2.9%)	
2nd degree	418 (91.3%)	163 (95.3%)	
3rd degree	7 (1.5%)	3 (1.8%)	
Gender (n = 629) <i>P</i> = .601 ^b			
Female	225 (49.1%)	80 (46.8%)	
Male	233 (50.9%)	91 (53.2%)	

^aColumn percentage.^bPearson Chi-square test.

	2019	2020	P
Number of patients, n (%)	458 (72.8)	171 (27.2)	
Application duration (days) median (min-max)	2 (0-15)	1 (0-10)	.096 ^a
Burn surface area median (min-max)	2 (1-30)	2 (1-10)	.005^a

Note: Bold values indicate the significance differences.

^aMann Whitney U-test.

TABLE 3 Comparison of the application durations of the participants according to the application time and burn surface area characteristics

When the data from 2019, before the COVID-19 pandemic started, were examined, 458 (72.8%) patients who applied to our burn center were included in the study. Among these patients, 233 (50.9) were male and 225 (49.1%) were female. Based on age groups, 124 (27.1%) patients were between the ages of 0 and 12, 42 (9.2%) between the ages of 13 and 18, 270 (59%) between the ages of 19 and 59 and 22 (4.8%) patients were aged 60 years or above. When the type of burns was examined, scalding was seen in 356 (77.7%) patients, a flame in 18 (3.9%), contact in 51 (11.1%), chemical burns in 21 (4.6%), electricity burns in 1 (0.2%) and sunburn in 11 (2.4%). According to the anatomical localisation of the patients, 33 (7.2%) patients had a burn on the head and neck, 17 (3.7%) on the trunk in addition to the head and neck, 284 (62%) on one extremity, 59 (12.9%) on two or more extremities, 38 (8.3%) in the trunk, 18 (3.9%) in the extremity in addition to the trunk, 6 (1.3%) in the gluteus and 3 (0.7%) in the perineum. When the burn degrees were examined, it was found that 33 (7.2%) patients had 1st degree burns, 418 (91.3%) had 2nd degree burns and 7 (1.5%) had 3rd degree burns (Table 1).

There was no statistically significant difference between the patients who applied to our burn center in the pre-pandemic and post-pandemic periods in terms of age groups, burn degree, causes of burns and gender characteristics ($P < .05$) (Table 2).

There was no statistically significant difference between the pre-pandemic and post-pandemic periods in terms of the admission times of the patients who applied to our burn center ($P < .05$). The median (min-max) value of the burn surface area of the patients who applied to the burn center in the pre-pandemic period was 2 (1-30), and the median (min-max) value of the patients who applied to the burn center in the post-pandemic period was 2 (1-10). A statistically significant difference was found between the pre-pandemic and post-pandemic periods in terms of the burn surface area of the patients who applied to our burn center ($P = .005$) (Table 3).

6 | CONCLUSIONS

Our hospital is located in Ankara, the most populous city in Turkey after Istanbul. Ankara is the capital of Turkey

and has a population of about 5 million. Our burn unit is a stage 2 burn unit and has six beds. It is managed by two doctors and four nurses.

Since we considered that patients were at risk of infection during the pandemic, all kinds of visits to our burn service were prevented. Only one accompanying person was allowed with the patients, and these companions were not allowed to leave the service except in mandatory situations. Our dressing unit, in which we follow up the patients and make their daily dressings, is located at the entrance of the inpatient service. During the pandemic, adult patients were only allowed to enter the dressing unit alone, except for necessary situations. The spread of the virus in the burn service was averted by ensuring that children and infants under the age of 18 years were dressed with only one parent.

When the burn patients admitted to the hospital were examined, it was found that the number of burn patients decreased by 63% in the same period of the year compared to the pre-COVID-19 period. We think that the decrease in this number is due to the fact that people spent time with their families at home because of social restrictions and cancellation of social organisations, and people's urge to go to the hospital was reduced due to the curfews imposed from time to time. In other studies, it was reported that admission to the burn services decreased by 50%.^{4,6} In addition, Chu et al found a 28% decrease in the admission of burn patients after the COVID-19 pandemic started.⁷ In another study conducted in India, a decrease of 37.7% was observed.⁸ When we analysed burn patients by gender during the pandemic process, no significant change was found, similar to the findings of other studies.^{5,9}

When the effects of COVID-19 were examined by age groups in our study, the age range of 19 to 59 years was the most affected group in both periods and was not affected by the COVID-19 pandemic. On the other hand, in the study of Akkoç et al, the most burned patient group before and after COVID-19 was found to be 1 to 5 years old group.⁵ In addition, Dayı et al reported that burn injuries were most common in the 0 to 2 age group.¹⁰ In these studies, as in our study, no effect of the COVID-19 pandemic was not found on the age distribution of burn patients. We think that the main reason for the difference in age groups is that there are burn centres in our city that treat both adult and paediatric patients, and these patients prefer the relevant centres.

In our study, the most common cause of burns was scalding, and no significant difference was found between the pre-pandemic and post-pandemic periods by burn causes. In this respect, there are studies supporting our findings in the literature.^{5,6} There are also studies in which the most common cause was found to be flame burn.⁴ In a retrospective study with a large sample, scalding was found to be the most common cause of burns, independent of COVID-19. Flame burns are the second most common cause of burns.¹¹

Considering the effect of the COVID-19 pandemic according to anatomical localisation, no significant difference was found again. The most common burn localisation seen in patients was found to be extremity. In the study conducted by Fan et al, the most common burn localisation was found to be the extremity. This finding supports the finding of our study.¹¹

The Mann Whitney *U*-test results revealed a significant difference in the burn surface areas of the patients who applied to our burn service when both the pre-COVID-19 and post-COVID-19 periods were analysed ($P = .005$). In the study of Akkoç et al, it was observed that there is a difference in the burn surface area when analysed by years, which supports the findings of our study.⁵

The COVID-19 pandemic has had many effects on social, cultural, financial and health areas, and these effects are likely to continue in the upcoming years. Burn is an emergency, it is preventable and it cannot be ignored. It has been observed that due to the COVID-19 pandemic, people are more careful as they spend more time with their family, and the urge to follow the rules has increased, and therefore the cases have decreased as well, but the application times have not changed. In addition, according to the results of our study, gender, age group, injury localisation or burn formation paths were not affected by the COVID-19 pandemic. Although there is no difference in the ways of burn formation, it has been found that the decrease in the number of burn trauma will contribute to reducing mortality and morbidity rates caused by burns with individual precautions and care.

CONFLICT OF INTERESTS

The are no conflicts of interest to declare.

ETHICS STATEMENT

The research was carried out with the permission obtained from Ankara Training and Research Hospital Scientific Research Board (E-21-759).

DATA AVAILABILITY STATEMENT

Raw data were generated at [Ankara Training and Research Hospital]. Derived data supporting the findings

of this study are available from the corresponding author [SA] on request..

ORCID

Saygın Altiner  <https://orcid.org/0000-0001-6118-9984>

Salih Tuncal  <https://orcid.org/0000-0002-6633-6557>

Yılmaz Ünal  <https://orcid.org/0000-0001-9712-5827>

Mert Çöl  <https://orcid.org/0000-0003-2758-5830>

Çağrı Büyükkasap  <https://orcid.org/0000-0002-9141-4289>

M. Recep Pekci  <https://orcid.org/0000-0002-5566-8134>

REFERENCES

1. Onah CN, Allmendinger R, Handl J, Dunn KW. Surviving burn injury: drivers of length of hospital stay. *Int J Environ Res Public Health*. 2021;18(2):761. doi:10.3390/ijerph18020761
2. Mason SA, Nathens AB, Byrne JP, et al. Trends in the epidemiology of major burn injury among hospitalized patients: a population-based analysis. *J Trauma Acute Care Surg*. 2017; 83(5):867-874. doi:10.1097/TA.0000000000001586
3. Allorto NL, Oosthuizen GV, Clarke DL, Muckart DJ. The spectrum and outcome of burns at a regional hospital in South Africa. *Burns*. 2009;35(7):1004-1008. doi:10.1016/j.burns.2009.01.004
4. Farroha A. Effects of COVID-19 pandemic on burns epidemiology. *Burns*. 2020;46(6):1466. doi:10.1016/j.burns.2020.05.022
5. Akkoç MF, Bülbüloğlu S, Özdemir M. The effects of lockdown measures due to COVID-19 pandemic on burn cases. *Int Wound J*. 2021;18(3):367-374. doi:10.1111/iwj.13539
6. Yamamoto R, Sato Y, Matsumura K, Sasaki J. Characteristics of burn injury during COVID-19 pandemic in Tokyo: a descriptive study. *Burns Open*. 2021;5:40-45. doi:10.1016/j.burnso.2021.06.007
7. Chu H, Reid G, Sack A, Heryet R, Mackie I, Sen SK. Changes in burn referrals and injuries during CoVid-19. *Burns*. 2020; 46(6):1469-1470. doi:10.1016/j.burns.2020.06.018
8. Aggarwal N, Srivastava RK. Impact of COVID-19 on patient trends and outcome: results from a tertiary care burn and plastic unit in northern India. *Indian J Plast Surg*. 2021;54(2): 172-176. doi:10.1055/s-0041-1729511
9. Williams FN, Chrisco L, Nizamani R, King BT. COVID-19 related admissions to a regional burn center: the impact of shelter-in-place mandate. *Burns Open*. 2020;4(4):158-159. doi: 10.1016/j.burnso.2020.07.004
10. Dayı S, Beyeç S, Alpağat Ş. The effect of COVID-19 in a newly established burn center. *Burns Open*. 2021;5(3):154-161. doi:10.1016/j.burnso.2021.06.005
11. Fan X, Ma B, Zeng D, et al. Burns in a major burns center in East China from 2005 to 2014: incidence and outcome. *Burns*. 2017;43(7):1586-1595. doi:10.1016/j.burns.2017.01.033

How to cite this article: Altiner S, Tuncal S, Ünal Y, Çöl M, Büyükkasap Ç, Pekci MR. The effect of COVID-19 pandemic on the number of patients in burns services. *Int Wound J*. 2022;1-5. doi:10.1111/iwj.13797