ORIGINAL ARTICLE

Does pandemic lockdowns affect the burn patient's admission?

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ABSTRACT

BACKGROUND: 2020 has started with Covid-19 pandemic. During the pandemic, govermental stringent precautions and lockdown measures have applied in Turkey. Although there was no limition for health care, people hesitate to go hospitals with the fear of Coronovirus transmission and all addmisions to hospitals decreased.

METHODS: Data of all patients admitted to our burn outpatient clinic during the pandemic period between March16, 2020 and June 1, 2020 compered with the same period in 2019. Demographic information and burn-specific variables of each patient were analysed.

RESULTS: Thirty nine patient admited to our clinic at covid period and 130 patient at 2019. There was a 70% reduction of admissions. In this stduy during pandemic period patients delayed days for admission, number of dressing change and total healing times were significantly longer, higher and longer ($p<0.001$, $p<0.001$, $p<0.001$, respectively). The number of surgery-required patients, hospitalization rates and the number of grafting were significantly high at the pandemic time ($p=0.003$, $p=0.007$ and $p=0.036$, respectively). Burn wound infection at admission has also found more frequent at covid-period ($p<0.001$).

CONCLUSION: Covid-19 pandemic made people hesitate to go to hospital even for emergencies. Unfortunately this fear caused unexpected consequences. Patients have developed complications due to delayed addmisions to specified medical centers for specific health problems. As a result, patients requiring special treatment, should be encouraged to immediatly seek professional medical advice especially for reel emergencies even during pandemic.

Keywords: Burn; delayed admission; pandemic.

INTRODUCTION

At the end of 2019 a new viral pneumonia has started in China, Wuhan. As it spread to other countries in a very short time, on January 30,2020, The World Health Organization named the disease coronavirus disease 2019 (COVID-19) and declared it a pandemic.[1,2] It is still a catastrophic public problem affecting all over the world. The first case in Turkey has detected on March 11, 2020. After the first patient has diagnosed, due to its wide- spread infectivity and high contagion rate, number of cases increased rapidly. From March 16, government implemented stringent precautions and lockdown measures to reduce the transmission rate and warn people to stay at home. With the introduction of lockdowns, admissions to hospitals decreased, although, there was no limitation for emergencies and even for health care services. Nevertheless, number of patients admitted to outpatient clinic of the burn treatment center also decreased. In this study the effect of delayed admissions on hospitalization rates, surgery requirements, outpatient treatment courses and the epidemiological characteristics of burn patients during lockdowns were evaluated.

MATERIALS AND METHODS

Data were retrospectively gathered from the patient files of hospital information system (HIS). Data of all patients treated

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Table 1. Distrubituion of the patients' gender, age and burned body parts

Parameters		2019	2020	Total	p
Gender, n (%)	Male	62 (47.7)	20 (51.3)	82 (48.5)	0.694
	Female	68 (52.3)	19 (48.7)	87 (51.5)	
	Total	130 (100.0)	39 (100.0)	169 (100.0)	
Age	Median	31 (11–89)	34 (22–88)	33 (11–89)	0.092*
	Mean [Years(±SD)]	36.00 (±16.39)	39.59 (±15.04)	36.83 (±1.24)	0.224**
Head &Neck, n (%)	None	101 (77.7)	26 (66.7)	127 (75.1)	0.162
	Yes	29 (22.3)	13 (33.3)	42 (24.9)	
	Total	130 (100.0)	39 (100.0)	169 (100.0)	
Upper Limp, n (%)	None	62 (47.7)	21 (53.8)	83 (49.1)	0.500
	Yes	68 (52.3)	18 (46.2)	86 (50.9)	
	Total	130 (100.0)	39 (100.0)	169 (100.0)	
Trunk, n (%)	None	111 (85.4)	27 (69.2)	138 (81.7)	0.022
	Yes	19 (14.6)	12 (30.8)	31 (18.3)	
	Total	130 (100.0)	39 (100.0)	169 (100.0)	
Lower Limp, n (%)	None	77 (59.2)	22 (56.4)	99 (58.6)	0.754
	Yes	53 (40.8)	17 (43.6)	70 (41.4)	
	Total	130 (100.0)	39 (100.0)	169 (100.0)	
Other, n (%)	None	126 (96.9)	36 (92.3)	162 (95.9)	0.205
	Yes	4 (3.1)	3 (7.7)	7 (4.1)	
	Total	130 (100.0)	39 (100.0)	169 (100.0)	

Values are presented as number of cases (column percent). Pearson Chi square test, *Mann-Witney U test, **Student t-test, p<0.05 is significant. SD: Standard deviation.

for burn injury at our burn outpatient clinic between March 16, 2020 and June 1, 2020 during which stringent lockdowns implemented was included. Data from study period compared with the same period in 2019.

For each patient, demographic information and burn-specific variables were tabulated from HIS including; gender, age, date of injury, date of admission, burn etiology, total body surface area (TBSA), and depth of burn, type of dressing and the number of dressing change also analysed. Of the hospitalized patients whether a surgery (escharectomy and/or grafting) performed also analysed. This retrospective observational study was approved by the local Institutional Review Board (IRB) (E.Kurul-E1-20-1244/28/10/2020).

Statistical analysis performed using Pearson Chi square test, Mann Witney U test and Student T Test to find the differences between the pandemic (2020) and non-pandemic (2019) periods. A p value <0.05 accepted as significantly different.

RESULTS

Total 169 patients admitted to our outpatient clinic during specified dates. 130 patients in 2019 and 39 patients in 2020 (pandemic-times), and admissions showed a reduction of 70%.

Of 169 patients included in the study, 87 (51.5%) were women and 82 men, and the mean age was 36.8 (±1.2) years, while the median age was 33 years. The demographic data of the patients who came in the same period in 2019 and the pandemic period were similar and are presented in Table 1. When the distribution of the patients according to the depth of the burn was examined, deep dermal burns were more frequent in the Covid period (Table 2).

When the patients were compared regarding their burn etiology, hot water and concentrated liquids, flame and chemical burns were the most frequently seen burn agents in both 2019 and pandemic period (Table 3).

Table 2. Comparison of the depth of burns during non-pandemic (2019) and pandemic (2020) periods

Clinical dermal depth	2019	2020	Total
	n (%)	n (%)	n (%)
Superficial dermal	88 (67.7)	21 (53.8)	109 (64.5)
Deep dermal	42 (32.3)	18 (46.2)	60 (35.5)
Total	130 (100.0)	39 (100.0)	169 (100.0)

Values are presented as number of cases (column percent).

Table 3. Distributions of burn aetiologies

Burn agent	2019	2020	Total
	n (%)	n (%)	n (%)
Hot water	65 (50.0)	18 (46.2)	83 (49.1)
Concentrated liquid	7 (5.4)	2 (5.1)	9 (5.3)
Oil	15 (11.5)	7 (17.9)	22 (13.0)
Chemical	18 (13.8)	2 (5.1)	20 (11.8)
Electricity	4 (3.1)	3 (7.7)	7 (4.1)
Contact	7 (5.4)	0 (0.0)	7 (4.1)
Flame	11 (8.5)	7 (17.9)	18 (10.7)
Other	3 (2.4)	0 (0.0)	3 (1.8)
Total	130 (100.0)	39 (100.0)	169 (100.0)

Values are presented as number of cases (column percent).

Within the 145 patients those followed up at outpatient clinic there were no difference between TBSAs among the years. However, their delayed days for admission, number of dressing change and total healing times were significantly longer, higher and longer, respectively, during the pandemic period ($p<0.001$, $p<0.001$, $p<0.001$) (Table 4).

During the study period sophisticated wound care products were used in a total of 12 patients. For the others, while paraffin gauze closures were used in superficial dermal burns in patients unlikely to develop infection, antibiotic or silver-containing wound closures were used in those having wound infection or likely to develop infection.

When the surgical needs, number of hospitalizations, escharectomy and grafting needs of the patients during the covid and non-covid periods were examined, the rate of patients requiring escharectomy during the covid period was higher. The number of surgery-required patients, hospitalization rates and the number of grafting performed were significantly higher than the non-covid period ($p=0.003$, $p=0.007$ and $p=0.036$, respectively) (Table 5).

Three patients refused hospitalization with the fear of covid infection and followed up at the policlinics. Of the 24 patients hospitalized, 12 (50%) were female and the mean age was 36.54±13.47 years. The ages, gender, burned total body surface areas, depth of the burns, delayed days and length of hospital stay in days were likely according to periods studied and shown at Table 6. Hot liquids were the leading burning agent at both periods. Treatment outcomes and surgical modalities were similar in between the years.

Table 4. Characteristics of outpatients

	2019	2020	p-value
	Mean (±SD)	Mean (±SD)	
TVYA (%)	2.35 (1.72)	2.89 (2.18)	0.238
Delay for admission	1.75 (6.17)	2.93 (2.49)	<0.001
Number of dressing change	3.39 (2.02)	4.71 (1.74)	<0.001
Treatment days	8.15 (5.84)	12.57 (6.32)	<0.001

Mann-Whitney U test (Student's T-test).

Table 5. Hospitalization and surgery requirements of all group

		2019	2020	Total	p-value
		n (%)	n (%)	n (%)	
Surgery indication	No	112 (86.2)	25 (64.1)	137 (81.1)	0.003
	Yes	18 (13.8)	14 (35.9)	32 (18.9)	
Hospitalization	No	117 (90.0)	28 (71.8)	145 (85.8)	0.007
	Yes	13 (10.0)	11 (28.2)	24 (14.2)	
Escharectomy	No	117 (90.0)	31 (79.5)	148 (87.6)	0.075
	Yes	13 (10.0)	8 (20.5)	21 (12.4)	
Grafting	No	117 (90.0)	30 (76.9)	147 (87.0)	0.036
	Yes	13 (10.0)	9 (23.1)	22 (13.0)	

Pearson Chi-square test, $p<0.05$ is significant.

Table 6. Hospitalized 24 patients' results according to covid and non-covid period

	2019	2020	p-value
n	13	11	
Age	37.46±18.10	35.45±4.67	0.706*
Gender, n (%)			
Male	7 (53.8)	5 (45.5)	0.265#
Female	6 (46.2)	6 (54.5)	
TBSA	2.48±1.14	5.18±5.44	0.094*
Depth, n (%)			
Superficial	3 (23.1)	1 (9.1)	0.363#
Deep	10 (76.9)	10 (90.9)	
Delay	4.69±6.69	2.64±1.12	0.326*
LOS	13±9.56	15.82±4.99	0.389*
Escharectomy, n (%)	13/13 (100)	8/11 (72.7)	0.082#
Grafting, n (%)	13/13 (100)	9/2 (81.8)	0.199#

TBSA: Total body surface area; LOS: Length of hospital stay in days. *Student t-test, #Pearson Chi-square.

Table 7. Burn wound infection at the admission

	BSI	2019	2020	p-value
		n (%)	n (%)	
Whole group	None	118 (90.8)	17 (43.6)	<0.001
	Yes	12 (9.2)	22 (56.4)	
Outpatients	None	108 (92.3)	12 (42.9)	<0.001
	Yes	9 (7.7)	16 (57.1)	
Hospitalized	None	10 (76.9)	5 (45.5)	0.122
	Yes	3 (23.1)	6 (54.5)	

BSI: Burn site infection.

Existence of burn wound infection at the admission was significantly more frequent at the covid-period group however there were no difference at the hospitalized patients (Table 7).

For the patients admitted to our policlinics at the day of injury (100/130 of non-covid and 4/39 of covid period), TBSA, number of dressing changes and healing period in days were similar (p=0.70, p=0.112 and p=0.282, respectively).

DISCUSSION

In Turkey, because of the Covid-19 pandemic, between March16 2020 and June 1 2020 nationwide strict lockdowns declared by the government in order to minimize the spread of Covid-19 corona virus infection. Covid-19 infection is very well known as having airborne transmission capability. The main aim of the lockdowns was to prevent people coming together at closed spaces and breath the same air. This understanding together with the fear of facing with Covid-19 patients or carriers at high-risk places like hospitals, caused patients to hesitate and a delay to seek for a medical support. Although no restrictions were made regarding to medical services during the lockdown, results of our study showed a clear decrease (70%) in the number of burn patients' admissions to both emergency department and burn outpatient clinic. Majority of series published about the relations between pandemic and adult burn cases lay out a decrease in the number of admissions.[3–5] As our study is retrospective, we could not have the patients' explanations however, to our opinion, fear of viral transmissions let them try to treat their minor wounds at home or at the other nearby health facilities instead of burn centers located mostly at big volume hospitals. On the other side, difficulty in the management of truncal burns even minor, truncal burns was significantly higher among Covid-period burn admissions.

Even burn ethiologies differ among genders,[6] there were no differences regarding the burn ethiologies among the genders according to the covid and non-covid periods. Burn ethiologies were also similar in between the study periods and scalding was the leading burn agent in all times.

In addition to the clear decrease in the number of patients during the pandemic period, delayed days for admission was significantly increased. To our understanding, patients tried to heal themselves by their own means or admitted to closer but non-burn specific health facilities. Since the burn injury is a specific injury requiring individualized and specialized treatment modalities, the treatment of these patients could not be achieved, and they were referred to and also obligated to visit our clinic located at a big volume hospital.

Significantly more dressing changes and outpatient clinic visits were required in the group of patients presenting late after the burn, and the recovery period of these patients was significantly prolonged. However, similar results were obtained for patients who admitted to the outpatient clinic on the same day of injury without delay at the covid pandemic, as in the non-covid period. Their unsuccessful efforts to treat their wounds, out of the burn centers, revealed significantly more burn wound infection rates. As there is no difference among the ones hospitalized, high infection rate of delayed covid-time minor burn victims is a reflection of improper treatment.

In our country, the majority of the people are insured under the social security system. It was found in our previous study that burn patients were at a low socioeconomic level.[7] Again, as of today, outpatient reimbursement of sophisticated wound care products in burn patients is not allowed. For this reason, wound care products were used in 12 patients who could only finance and provide sophisticated products. Conventional wound dressings and semi-permeable wound care

products with or without antibacterials were used for the rest of burn patients.

Comparison of the depth of the patients showed an increase in the rate of deep dermal burns during pandemic. As is well known that Jackson's intermediate zone progress to deeper burns via necrosis regarding improper management of the burn wound. Combining the deeper presentation of the wounds with high burn wound infection rates, not only delaying itself, but also improper dressings supposed to add to the deepening.

There were 3 patients refused the hospitalization and were followed up at the policlinics. Among the out-patiently treated 145 burns, burned TBSA were similar, however, covid-time patients' delay for seeking for a burn center support was significantly longer. Out-patiently treated covid-period patients had significantly more burn wound infection rates requiring topical and systemic antibiotics. These patients required significantly more dressing changes and consequently had significantly more longer healing times for complete recovery.

Covid-time patients, mainly dependant to the delay in the initiation of proper treatment at a burn facility, necessitated significantly more surgical intervention, that in turn, significantly increased hospitalization rates. Deepening of the wounds with further being complicated by infection add to the number of surgical indication rates. Escharectomy requirement and grafting were significantly higher among the covid-time patients.

Hospitalized Covid-time burn patients had larger burned TBSA and had deeper wounds than the non-covid time victims. However, the latency period was shorter in these patients. To our opinion, patients with more severe burns do not experience delays in their admission to the outpatient clinic and seek emergency medical assistance despite Covid measures.

Our study also supported a problematic fact of emergency departments that all the world tries to overcome, green area patients. Green area patients increase the workload of emergency department staff and cause loss of workforce in emergency services all over the world.[8] With our finding among burn emergencies during the pandemic process, the rate of admission to hospitals by real emergencies has relatively increased.

Conclusion

During pandemic lockdown, the fear of viral exposure made patient to stay at home even they exposed a painful burn injury. The ones seek for medical support hesitate to consult to specific burn units as all of them are located at high volume hospitals, at least as it is in Turkey. This prevention aimed reflex caused unexpected consequences complicating the treatment approaches. Complications due to delay in specified medical advice put patients under more Covid-19 transmission risk firstly by the complications of the primary illness, and secondly, via increment of duration passed at hospitals where transmission probability is one of the most and also from home to hospital travels. Patients should be encouraged to immediately seek professional medical advice for the reel emergencies even during the Covid-19 pandemic.

Ethics Committee Approval: This study was approved by the Ankara City Hospital Ethics Committee (Date: 28.10.2020, Decision E.Kurul-E1-20-1244).

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ORİJİNAL ÇALIŞMA - *ÖZET*

Pandemi kısıtlamaları yanık başvurularını etkiledi mi?

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AMAÇ: 2020 yılı Covid-19 pandemisi ile başladı. Türkiye'de pandemi sırasında devlet tarafından alınan önlemler ve kısıtlamalar uygulamaya koyuldu. Sağlık hizmetlerine erişim konusunda herhangi bir kısıtlama olmasa da halk coronovirüs bulaşından korktuğu için hastaneye gitmekte çekingen kaldı ve buna bağlı olarak tüm hastane başvurularında azalma yaşandı.

GEREÇ VE YÖNTEM: Hastanemiz yanık merkezi polikliniğine pandeminin ilk dönemi olan 16 Mart 2020 ile 1 Haziran 2020 tarihleri arasında başvuran hastaların bir önceki yılın aynı tarihlerinde polikliniğe başvuran hastaların demografik ve yanık spesifik değişkenleri karşılaştırıldı ve analiz edildi.

BULGULAR: Covid döneminde otuz dokuz hasta polikliniğe başvururken 2019 yılında 130 hasta başvurusu mevcuttu. Hasta başvurularında %70 azalma yaşandı. Bu çalışmada pandemi döneminde hastaların başvuru sürelerinin, pansuman sayısının ve toplam iyileşme sürelerinin anlamlı olarak arttığı görülmüştür. Cerrahi ihtiyacı olan hasta sayısı, hastaneye yatış endikasyou ve greft ihtiyacı da pandemi döneminde anlamlı olarak artmıştır. Aynı zamanda pandemi döneminde hastaneye yatış sırasında enfeksiyon varlığına daha fazla rastlanmıştır.

TARTIŞMA: Covid 19- pandemisi hastaların acil durumlarda dahi hastaneye gitmekte çekingen kalmasına neden olmuştur. Ancak bu durum istenmeyen sonuçlara neden olabilir. Spesifik sağlık problemi olan hastaların özellikli sağlık hizmeti veren merkezlere geç başvurusu komplikasyon gelişmesine neden olur. Sonuç olarak özellikli tedavi gereksinimi olan gerçek acil durumlarda, pandemi sırasında dahi tıbbi hizmetin alınmasının gerekliği ve önemli olduğu konusunda toplum bilgilendirilmeli ve sağlık hizmetine erişim teşvik edilmelidir.

Anahtar sözcükler: Geç başvuru; pandemi; yanık.

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