RESEARCH ARTICLE / ARAŞTIRMA MAKALESI

The Effect of the Covid-19 Pandemic on Emergency Department Forensic Admission

Covid-19 Pandemisinin Acil Servis Adli Başvurularına Etkisi

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Abstract

Introduction The COVID-19 epidemic, which affected the whole world, also affected judicial events. This study will examine how the epidemic affected the forensic cases admitted to the emergency service.

Materials and Methods In this study, the files of all patients whose forensic records were opened in the Emergency Service between 2019 and 2022 were retrospectively scanned. Patient admissions were classified according to March 2020, when our country's first COVID-19 case was seen. They were divided into 3 groups: pre-pandemic, pandemic and post-pandemic period, and the data obtained were compared within themselves.

Results The files of 17,323 patients on the specified dates were reviewed. 81.7% of the patients were male. 16.6% were foreign nationals. It was observed that the highest rate was during the pandemic period (38.7%) and patients who were admitted for forensic examination (83.0%). It was determined that most of the patients were discharged from the emergency department (98.2%), and most inpatients were followed up in the internal services (35.8%). The rate of patients referred was determined to decrease during the pandemic compared to the previous period. Forensic admissions were at the lowest rate after the declaration of a pandemic, and in the post-pandemic period, they exceeded the pre-pandemic level. It was observed that the number of patients who attempted suicide decreased during the pandemic and did not increase in the post-pandemic as much as in the pre-pandemic. However, it was observed that this rate increased during the period when strict quarantine rules were implemented. Even though the rate of traffic accidents and assault patients decreased during the pandemic, it more than doubled during the post-pandemic compared to the pre-pandemic.

Conclusion It is seen that the flow of forensic cases to emergency department does not decrease even in pandemics. Since most forensic cases have a traumatic process, emergency department admissions can guide the number, character, and prognosis of forensic cases. In another pandemic, forensic events can be controlled.

Keywords Emergency Department, Forensic admissions, COVID-19, Pandemic Effect

Özet

Amaç Tüm dünyayı etkisi altına alan COVID-19 pandemisi, adli olayları da etkilemiştir. Bu çalışmada; çoğu zaman adli başvuruların ilk başvuru yeri olan acil servislerin, salgında nasıl etkilendiği incelenmeye çalışılacaktır.

Gerec ve Yöntemler Çalışma için; 2019-2022 yılları arasında, Acil Servis'te adli kayıt açılmış tüm hastaların dosyaları geriye dönük tarandı. Hasta başvuruları ülkemizde ilk COVID-19 vakasının görüldüğü Mart 2020 tarihine göre sınıflandırıldı. Pre-pandemi, pandemi ve pandemi sonrası dönem olarak 3 gruba ayrıldı ve elde edilen veriler kendi içinde kıyaslandı.

Bulgular Belirtilen tarihlerdeki 17,323 hastanın dosyası incelendi. Hastaların %81,7'si erkek cinsiyette idi.. En fazla oranda pandemi döneminde (%38,7) ve adli muayene nedeni ile başvuran hastaların olduğu görüldü (%83,0). Hastaların büyük bir kısmının acilden taburcu olduğu (%98,2), yatan hastaların ise en fazla oranda dahili servislerde (%35.8) takip edildiği tespit edildi. Sevk olan hastaların oranının; pandemi döneminde bir önceki döneme göre azaldığı tespit edildi. Adli başvuruların, pandemi ilan edildikten sonra en düşük seviyede olduğu, pandemi sonrası dönemde ise pandemi öncesi dönem seviyesini geçtiği gözlendi. Suicid girişimi olan hastaların sayısının pandemi döneminde azaldığı ve normalleşme döneminde bile pandemi öncesi dönemdeki oran kadar artmadığı gözlendi. Ancak katı karantina kuralları uygulandığı zaman diliminde bu oranın arttığı gözlemlendi. Trafik kazası ve darp hastalarının oranı pandemi döneminde azalsa bile normalleşme döneminde pandemi öncesi döneme kıyasla 2 katından fazla artmıştı.

Sonuç Salgınlarda bile adli vakaların acil servislere akışının azalmadığı görülmektedir. Adli vakaların çoğunda travmatik bir süreç yaşandığı için adli olayların sayısı, karakteri, prognozunun değerlendirilmesinde acil servis başvuruları yol gösterici olabilir, başka bir salgında adli olayların kontrolünü sağlayabilir.

Anahtar Kelimeler Acil Servis, Adli başvurular, COVID-19, Pandemi etkisi

INTRODUCTION

During the COVID-19 pandemic, isolation was necessary. People were confined to their homes. For this reason, the course of forensic events has changed, as in every other issue. Studies report that the number of events in which more than one person is affected, such as accidents and assaults, has decreased due to stay-at-home rules, travel restrictions, and strict social distance rules (1, 2).

Emergency physicians have forensic medicine duties as well as curative medicine duties (3). Emergency departments (ED) are units that are always open to injuries without an appointment. Therefore, in forensic cases, the person can be admitted to the emergency service themself or be accompanied by security forces. The patient profile has changed due to the pandemic in the ED, where there are often unnecessary admissions. This situation also affected the urgent admissions of forensic events. In the studies, it has been determined that the rate of work accidents, traffic accidents, and harm to others decreased (4). In addition, it can be said that admissions to the ED have decreased due to the fear of disease (5).

Many studies in the literature have data obtained before and during the pandemic. Still, there are a limited number of studies, including data on the normalisation period, in which the effect of the pandemic has passed. This study examined the ED admissions of forensic cases before, during the pandemic (the peak period of the pandemic, when the vaccination became widespread, and its effect was observed) and when its effect decreased. Thus, the effect of the pandemic on forensic cases admitted to the ED was tried to be understood.

MATERIAL and METHODS

Patient Selection

In the study, the files of all national patients whose forensic records were registered in the ED of Kırklareli Training and Research Hospital between 2019 and 2022 were scanned retrospectively.

According to the ICD code, V00-V99 diagnoses were classified as a traffic accident, W50-51 as assault, W26 as sharp injury, and X60-X84 as a suicide attempt. Moreover, it has been selected from the patients with Z00 ICD code files whether an examination before being taken under custody and released, or it was noted whether there was a work accident.

Patients' demographic characteristics, time of admission, definition of the forensic event, diagnosis, prognosis in the emergency room, hospitalisation, number of days hospitalised and prognosis were examined. The files were analysed using the archive and hospital electronic record system.

Time Interval

Patient admissions were classified based on March 2020, when the first case of COVID-19 was seen in our country. The one year before this date was considered pre-pandemic. The period until July 2021, when the 2nd dose of vaccination was completed, as a pandemic, and the period when quarantine practices were relaxed was considered the normalisation period.

Pre-pandemic: January 1, 2019 - March 11, 2020 (15 months)
Pandemic: 12 March 2020-30 June 2021 (16 months)
Post-pandemic (Normalization): 1 July 2021-31 March 2022 (9 months) was accepted and the files were examined.

In addition, the dates between April 29 and May 17, 2021, when strict quarantine regulations were admitted during the pandemic period, were compared with the previous year (when gradual quarantine practices were implemented) and the pre-pandemic period.

Statistical Analysis

In the descriptive statistics of the data, mean, standard deviation, median minimum, maximum, frequency and ratio values were used. The distribution of variables was measured with the Kolmogorov-Smirnov test. The Kruskal-Wallis test was used in the analysis of quantitative independent data. The Chi-Square test was used to analyse qualitative independent data, and the Fischer test was used when the Chi-square test conditions were not met. SPSS 28.0 program was used in the analysis. $P<0.05$ was considered significant.

RESULTS

The files of 17,323 patients whose forensic records were registered in the hospital system on the specified dates were examined. 81.7% of the patients were male. It was observed that the highest rate was during the pandemic

period (38.7%) and patients who were admitted for forensic examination (83.0%). It was found that most of the patients were discharged from the ED (98.1%), and most inpatients were followed up in the internal services (35.8%) (Table 1).

Table 1. Demographic characteristics of patients and results in the ED

		Min-Max	Median	Mean.±SD n-%
Age		1.0 - 96.0	33.0	34.78 ± 14.12
Gender	Female			3175 18.3%
	Male			14148 81.7%
Period	Pre-Pandemic			5688 32.8%
	Pandemic			6710 38.7%
	Post-Pandemic			4925 28.4%
Reason for admission	Assault			1195 6.8%
	Traffic accident			1077 6.2%
	Sharp Injury			138 0.7%
	Suicide attempt			503 2.9%
	Forensic exam			14385 83.0%
	Other			25 0.4%
Result in the ED	Discharged			16950 97.8%
	Referred			61 0.3%
	Hospitalised			307 1.8%
	Exitus			5 0.02%
Inpatient service	Internal Service			110 35.8%
	Surgery Service			106 34.5%
	Intensive Care Unit			91 29.6%
Number of days hospitalised		1.0 - 30.0	2.0	3.23 ± 3.43

SD: Standart Deviation, Other: Myocardial infarction (at work), arrest of unknown cause, abuse, asphyxia, electric shock

It was determined that there were 223766 ED admissions to our hospital in the pre-pandemic period, 181487 during the pandemic, and 124453 in the post-pandemic period. According to this result, forensic admission rates were calculated as 2.5% in the pre-pandemic period, 3.6% during the pandemic period, and 3.9% in the post-pandemic period. The age of the patients in the pre-pandemic and pandemic groups was significantly higher (p=0.000) than the post-pandemic group. The rate of male patients in the pandemic period was significantly higher (p=0.001) than the other groups **(Table 2).**

When examined in terms of the reason for the admission, the rate of patients admitted due to assault and traffic accidents in the post-pandemic was significantly higher (p=0.000) than in the pre-pandemic and pandemic periods. The number of patients who were diagnosed with forensic examination in all periods was found to be higher than other patient groups. The rate of patients presenting with the cause of suicide in the pre-pandemic period was significantly higher (p=0.000) than in the pandemic and the post-pandemic period. In addition, the number of patients discharged from the ED in all periods was higher than those who were referred, hospitalised, and ex-groups. The rate of patients referred from the ED was significantly higher (p=0.000) in the pre-pandemic and pandemic periods. The hospitalisation day was significantly higher (p=0.013) in the pandemic group than in the others **(Table 2)**

Table 2. Classification of Patients According to Periods

Mean±SD/n-%

	[1]Pre-pandemic		[2]Pandemic		[3]Post-Pandemic		p	
Age	35.66±14.17		35.26±14.18		33.12±13.83		**0.000[k]**	
Gender								
Female	1124[2,3]-19.8%		1152-17.2%		899-18.3%		**0.001[x2]**	
Male	4564-80.2%		5558-82.8%		4026-81.7%			
Reason for admission								
Assault	360	6.3%	285	4.2%	549	11.1%	***0.000***	x^2
Traffic Accident	242	4.3%	295	4.3%	541	10.9%	***0.000***	x^2
Sharp Injury	51[3]	0.8%	55 [3]	0.8%	32	0.6%	*0.348*	x^2
Suicide attempts	220[2,3]	3.8%	141[3]	2.1%	142	2.9%	***0.000***	x^2
Forensic exam	4799[2,3]	84.3%	5926[3]	88.3%	3660	74.3%	***0.000***	x^2
Other	16[2,3]	0.2%	8	0.1%	1	0.0%	***0.002***	x^2
Result in ED								
Discharged	5545[2]	97.5%	6583	98.1%	4822	97.9%	0.056	
Referred	31	0.5%	30	0.4%	0	0.0%	**0.000**	
Hospitalised	110	1.9%	94[1,3]	1.4%	103	2.1%	**0.011**	X2
Exitus	2	0.0%	3	0.0%	0	0.0%	**p>0.005**	
Inpatient Service								
Internal Service	18	0.3%	33	0.5%	59	1.2%	***0.000***	
Surgery Service	55[2,3]	1.0%	36[3]	0.5%	14	0.3%	***0.000***	x^2
ICU	37	0.7%	24[1,3]	0.4%	30	0.6%	0.050	
Number of days hospitalised	3.81 ± 3.98		3.39 ± 4.01		2.46 ± 1.63		***0.013***	K

SD: Standard Deviation, [K]Kruskal-Wallis (Mann-Whitney U test) /[X²] Chi-Square test (Fischer test)
Other: Myocardial infarction (at work), arrest of unknown cause, abuse, asphyxia, electric shock
ICU: Intensive Care Unit
[1]Difference with Pre-Pandemic Group p<0.05,
[2]Difference with Pandemic Group p<0.05,
[3]Difference with Post-Pandemic Group p<0.05

The number of admissions remained unaffected despite the quarantine practices and patient classification changes (Table 3).

Table 3. Admissions according to quarantine periods

Mean.±SD/n-%

	[1]Pre-pandemic		[2]Non-strict quarantine		[3]Strict quarantine		p	
Age	33.38 ± 14.58		35.05 ± 14.80		35.42 ± 15.23		0.237	K
Gender								
Female	57	19.4%	21	17.5%	58	24.4%	0.225	X^2
Male	237	80.6%	99	82.5%	180	75.6%		
Reason for admission								
Assault	17	5.7%	7	5.8%	11	4.6%	p>0.05	X^2
Traffic Accident	10	3.1%	7	5.8%	14	5.8%	p>0.05	X^2
Sharp injury	0	0.0%	0	0.0%	4	1.7%	p>0.05	X^2
Suicide attempts	7	2.3%	2	1.7%	11	4.6%	0.203	X^2
Forensic exam	259	88.1%	104	86.7%	198	83.2%	0.262	X^2
Other	1	0.3%	0	0.0%	0	0.0%	p>0.05	X^2
Result in ED								
Discharged	288	98.0%	118	98.3%	227	95.4%	0.142	X^2
Hospitalised	4	1.4%	2	1.7%	10	4.2%	0.090	X^2
Referred	2	0.7%	0	0.0%	1	0.4%	p>0.05	X^2
Inpatient Service								
Internal service	2	0.7%	1	0.8%	5	2.1%	p>0.05	X^2
Surgery service	1	0.3%	1	0.8%	2	0.8%	p>0.05	X^2
ICU	1	0.3%	0	0.0%	3	1.3%	p>0.05	X^2
Number of days hospitalised	0.04 ± 0.35		0.07 ± 0.53		0.08 ± 0.42		0.098	K

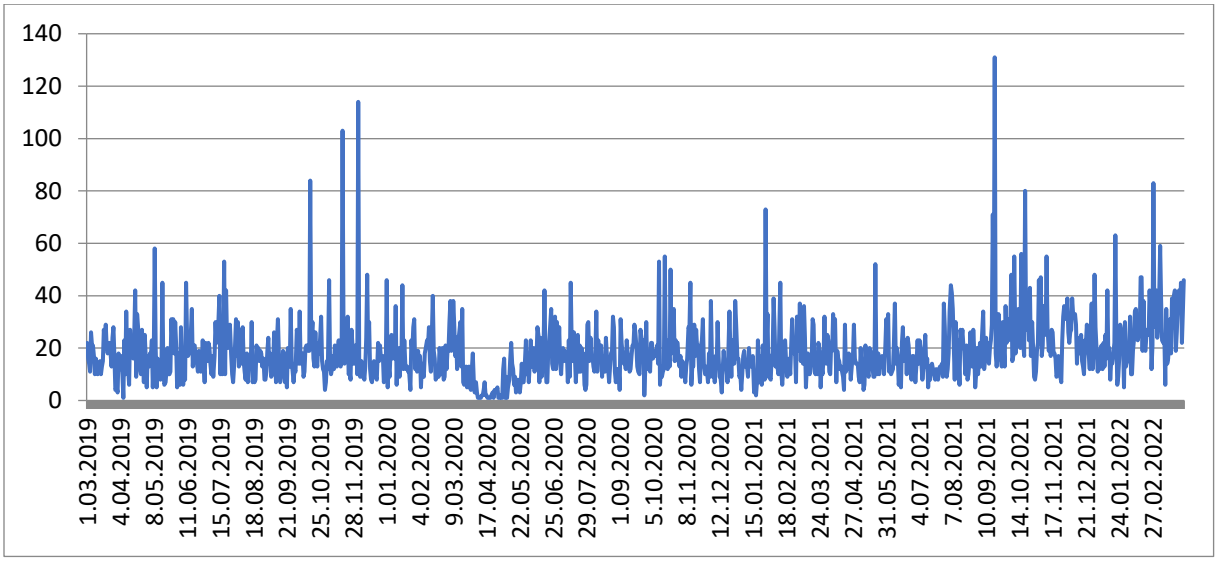
SD: Standard Deviation, [K] Kruskal-Wallis (Mann-Whitney U test) /[X^2] Chi-Square test (Fischer test)

Other: Myocardial infarction (at work), arrest of unknown cause, abuse, asphyxia, electric shock

ICU: Intensive Care Unit

It was determined that forensic admissions were at the lowest level after the declaration of a pandemic, and in the post-pandemic period, they exceeded the pre-pandemic level **(Figure 1).**

Figure 1: Distribution of forensic cases by months



DISCUSSION

In this study, the pre-pandemic, pandemic and post-pandemic periods are compared. The number of cases is thought to have decreased sharply at the beginning of the pandemic. Still, it is seen that the number of forensic cases generally increased during the pandemic period and continued to increase in the post-pandemic period. It has been determined that the number of patients in the suicide group decreased relatively during the pandemic period compared to the pre-pandemic period, and the number of assault and traffic accident patients increased more than twice in the post-pandemic period compared to other periods.

A study in the emergency service admissions of forensic cases found that male patients' rate was higher than female patients before and during the pandemic (6). In this study, similarly, it was found that male patients were admitted at a high rate in all periods. It can be said that men are more likely to be involved in forensic events than women. Studies have shown that the rate of involving pediatric patients in the ED with a forensic incident decreased during the pandemic (7). This study shows that the average age remained the same in the pre-pandemic and pandemic periods but decreased in the post-pandemic period. Therefore, this results align with the literature, namely that forensic incidents involving pediatric patients were less during the pandemic and increased in the post-pandemic period.

The literature has determined that the number of trauma patients and the hospitalisation rate decreased significantly during the pandemic (8). The most important factor causing this situation may be staying home and away from crowded. Due to social distance rules, the number of cases such as fights, injuries and attacks has decreased. In this study, during the pandemic, it was determined that the rate of patients who were assaulted decreased. If all trauma patients are taken together, it is seen that the rate increases significantly in the post-pandemic period. This situation can be expected during the normalisation period. Still, the increase in the number of patients more than before can be called the 'new normal'. This study reveals a high discharge rate from the ED across all periods. The discharge rate was

even higher during the pandemic, while the number of hospitalised patients was lower than in other periods. Moreover, the rate of trauma patients was also lower during the pandemic. Following the pandemic, there has been an increase in the number of trauma patients, which, in turn, has led to a parallel increase in the hospitalisation rate. It was determined that the hospitalisation rate increased proportionately to the rate of trauma patients when strict quarantine rules were implemented. The suicide attempt patient rate increased during this period. Because this period was short, it is worth noting that this observation cannot be generalised. In addition, the decrease in the rate of inpatient forensic cases during the pandemic may be due to the clinicians' focus on the treatment of COVID-19 patients and the transformation of our hospital into the only pandemic hospital in the province. The fact that the referral rate during the pandemic period is higher than the post-pandemic period explains this situation.

CONCLUSION

EDs are the first place of admission for all victims of violence. Emergency physicians must confidently protect the patient's rights, meticulously preserve the evidence without any risk of corruption, and promptly report the incident (9). It is seen that the flow of forensic cases to EDs does not decrease even during the pandemic. Since most forensic cases have a traumatic process, it may be a good idea to evaluate ED admissions. Since the data of
our study was obtained from the archive of the largest and sole hospital in the city centre it can represent the general population.

Limitations of the Study

The main limitation is a retrospective study. When the patient files were examined one by one, it was observed that the diagnoses of some patients were entered as a general title instead of the event-specific ICD code, or the diagnosis made at discharge was entered into the system. In addition, since the reports of the forensic cases from the district hospitals could not be found in the system, the diagnoses entered the system were taken as a basis to maintain the study method.

Ethical Declerations:
Kırklareli University Medical School Ethics Committee (P202200030-04/14.09.22) has approved this study.
Informed Consent:
Because the study was designed retrospectively, no written in formed consent form was obtained from patients.
Conflict of Interest Statement:
The authors have no conflicts of interest to declare.
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Author Contributions:
All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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