

Impact of COVID-19 Pandemic on Emergency General Surgical Admission in King Faisal Hospital Makkah, KSA

Elfaki A. Elbagir, FRCS.FACS* Hatem A. Sembawa, FRCS.C, FACS* Eyad T. Ebrahim, MD** Talaat A. Zaid, MD** Asrar A. Banjar*** Rahaf M. Alradadi*** Ghalia T.M. Futayh***

ABSTRACT

Introduction and Background: The COVID-19 pandemic of 2020 has greatly impacted healthcare service and disruption in functioning of hospitals worldwide. The applied restrictive preventive measures affected patients' decision to visit emergency departments (ED) hospitals seeking surgical consultation and other medical care. However, there are numbers of problems that contribute to the noticeable decrease of ED visits in the pandemic period. With the upsurge of confirmed cases of covid-19 patients, people are getting anxious of ED visits in fear of hospital acquired infection. The kingdom of Saudi Arabia, one of the best countries successfully applied the highly restrictive health measures to prevent and spread of with COVID-19 was on March 2nd, 2020.

Aim: This study aims to assess and compare the impact of COVID-19 pandemic on emergency department admissions volume of emergency surgical patients in King Faisal General Hospital, Makkah, Saudi Arabia.

Methods: A retrospective cohort study was conducted including All patients who visited King Faisal Hospital ED, and required general surgery consultation from 2019 and 2021, six months before and similar period during the pandemic covid-19. Data were collected from medical records of patient who visited ED and required surgical consultation, in pre and during pandemic period. Data were analyzed and compared to a corresponding non-pandemic period covering the same time interval in 2019 and 2021. A pre-structured data collection sheet for each period that consists of four primary sections was used to avoid data extraction errors.

Results: A total of 872 patients were included in this study, during 2019, 256 (29.4%) during 2020, and 616 (70.7%) during 2021. Exact of 67% of those who attended at 2019-2021 were regular patients versus to 70.7% of others who attended at 2020. As for level of triage, it was CAT 2 among 48.1% of cases admitted during 2019-2021 versus 46.9% of cases admitted during 2020. Considering length of hospital stay, 33.6% of cases admitted during 2019-2021 were for 1 day versus 27.3% of those admitted during 2020 while admission for 2-4 days was reported among 42.2% and 36.7%, respectively (P=.004).

Conclusion: In conclusion, the current study showed that there was a significant drop at the number of patients attended to ED and reduced the length of hospital stay during the peak of covid-19 pandemic. The indirect impact of Covid-19 on the healthcare system can help improve treatment strategies in future outbreaks.

Keywords: Covid-19 pandemic, emergency visits, admission, Makkah.

INTRODUCTION

By the end of year 2019, the first case of COVID-19 in Wuhan, china was reported to the World Health Organization (WHO)¹. On March 2020, WHO declared that covid-19 was classified as a pandemic^{1,2}. Thereafter, the virus has spread globally including nearly all world. Since then surgical activity and admission to the emergency department (ED) decreased globally³.

In Saudi Arabia, the first patient diagnosed with COVID-19 was on March 2nd, 2020^{4,5}. On March 23, 2020, the Kingdom announced the suspension of all domestic and international travel. Curfew with lockdowns were placed and very restricted measures for the public including social distancing were asked. Thus, patients and relatives decision to visit emergency department hospitals seeking medical care was affected. People are getting anxious of emergency department

(ED) visits in fear of hospital acquired infection, that has caused huge disruption in the functioning of community and hospitals across the country.

However, there are numbers of problems that contribute to the noticeable decrease of ED visits in the pandemic period^{6,7}. With the upsurge of confirmed cases of covid-19 patients.

Many changes in surgical practice have been enacted during the Covid-19 pandemic.

Cancellation of all scheduled elective surgery and advice to manage many of surgical condition conservatively when possible.

In our hospital, like many other hospitals in the region, we witnessed a decreased of mild and even moderately sick patients. Only had to deal with severely sick ones who had no choice but to present to the hospital^{8,9,10}. Our study was conducted at King Hospital, a general

* Umm-Alqurq University
Faculty of Medicine
Department of Surgery
E-mail: eafaki@uqu.edu.sa

** Department of Surgery
King Faisal Hospital, Makkah.

*** Umm-Alqurq University, Faculty of Medicine.

hospital in Makkah, it has assigned by local health authority to receive the surgical emergency cases in Makkah holy city during the pandemic covid-19 period.

AIMS

In this study, we aim to assess the pattern of admission volume in emergency departments in king Faisal Hospital Makkah and compare the rate and volume during non-pandemic period 2019 with the same period during pandemic period 2020.

METHODOLOGY

A retrospective cohort analysis of all patients admitted via emergency surgical team at King Faisal General Hospital in Makkah, Saudi Arabia. Two periods of six months period were reviewed, from the start of the lockdown (March 25th., 2020 to September 25th., 2020), and the same period of six months year earlier (March 25th., to September 24th., 2019). All patients admitted in these two-period reviewed. All patients with a non-general surgical pathology were excluded (urology, orthopedics, neurosurgery and vascular). Data were collected on patient age, gender, nationality and length of stay.

Data were collected from medical record of patient who visited ED and required surgical consultation, between pandemic period March 2020 (the beginning of the “lockdown” stage of the Saudi pandemic plan March 23, 2020) and August, 2020 (end of the study period) were analyzed and compared to a corresponding non-pandemic period covering the same time interval in 2019 and 2021 (March –August, 2019) (March –August, 2021). A pre-structured data collection sheet for each month that consists of four primary sections was used to avoid data extraction errors. Data were collected, revised, coded, and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done.

using two tailed tests. P value less than 0.05 was statistically significant. Descriptive analysis based on frequency and percent distribution was done for all variables. IRB ethical approval was obtained.

RESULTS

A total of 872 patients were included in this study, 616 (70.6 %) patient admitted in the period during the non covid-19 pandemic (March 2019-September) among them 452(73.4%) Saudis and 164 (26.6%) non-Saudis. While 256 (29.4%) patient admitted during the covid-19 period (March 20-September 2021) among them 181 (70,7%) Saudis and 75 (29,3%) non-Saudis. The number of patients was substantially dropped in covid-19 pandemic cohort than the non-covid-19 pandemic.

256 patients admitted as emergency (29.4%) during covid 2020, compared to 616 (70.6%) during non-covid the same period of 2019. The study showing 53.7% reduction in patients presenting to the emergency general unit. As a comparison, the mean age of patients attended during 2019 and was 42.0 ± 18.2 years old compared to 41.1 ± 17.5 for those who were admitted during 2020 with no statistical significance (P=.806). As for gender, 58.6% of patients attended to ER during 2019 and 2020 were males in comparison to 71.9% of those who attended during 2020 with statistically significant difference (P=.001). Exact of 73.4% of patients attended to ER during 2019-2021 were Saudi compared to 70.7% of those who attended during 2020 (P=.420). Table1. As for level of triage, it was CAT-2 among 48.1% of cases admitted during 2019 (non-covid period) versus 46.9% of cases admitted during 2020 (covid period). Also, 16.2% of patients during 2019 (non-covid period) had CAT-3 in comparison to 22.3% of others admitted during 2020 (covid period) (P=.001),Table2.

Considering length of hospital stay, 33.6% of cases admitted during 2019-2021 were for 1 day versus 27.3% of those admitted during 2020 while admission for 2-4 days was reported among 42.2% and 36.7%, respectively (P=.004). Table 3.

Table 1. Characteristics of all general surgical emergency admission in King Faisal Hospital 6 months before and during covid-19 pandemic

	Non-covid19 March -August 2020		During covid19 March -August 2021		P-value
	No:	%	No: %		
Age in years					.789^s
< 20	48	7.8%	22	8.6%	
20-29	142	23.1%	59	23.0%	
30-39	118	19.2 %	47	18.4%	
40-49	113	18.3%	55	21.5%	
50+	195	31.7%	73	28.5%	
Mean +/-SD	42.0 + 18.2		41.1+ 17.5		806 [#]
Gender					.001[*]
Male	361	58.6%	184	71.9%	
Female	255	41.4%	72	28.1%	
Nationality					.420
Saudi	452	73.4%	181	70.7%	
Non-Saudi	164	26.6%	75	29.3%	
Total	616	100%	256	100%	

P: Pearson X² test. # Independent t-test. \$ Exact probability test. P < 0.05 (significant)

Table 2. Comparison of level of triage at CAT areas in the ER of King Faisal Hospital during non-covid-19 time and covid-19 time of similar period

Admission Data	2019		2020		p-value
	No	%	No	%	
Level of Triage					.001*^s
CAT 1	21	3.4%	17	6.6%	
CAT 2	296	48.1%	120	46.9%	
CAT 3	100	16.2%	57	22.3%	
CAT 4	1	.2%	2	.8%	
CAT 5	1	.2%	3	1.2%	
<i>Not reported</i>	197	32.0%	57	22.3%	

*level of Triage = **CAT1**(immediate(resuscitation) **CAT2**(Emergent within 15 minutes) **CAT3**(Urgent within 30 minutes) **CAT4**(less urgent 60 minutes and **CAT5** (Non-Urgent 2 hours).

P: Pearson X² test. # Independent t-test. \$ Exact probability test. P < 0.05 (significant)

Table 3. Comparison of length of stay in days of emergency admissions in King Faisal Hospital during non-covid-19 time and covid-19 time of similar period

Length of stay	Non-covid cases		During covid cases		P-value
	Pt. No.	%	Pt. No.	%	
<i>1 day</i>	207	33.6%	70	27.3%	
<i>2-4 days</i>	260	42.2%	94	36.7%	
<i>5-7 days</i>	80	13 %	44	17.2%	
<i>> 7 days</i>	69	11.2%	48	18.8%	
Mean ± SD	4.2 ± 6.5		5.1 ± 6.9		.025**

P: Pearson X² test. # Independent t-test. \$ Exact probability test. P < 0.05 (significant)

DISCUSSION

Globally, new literature revealed that fear of being infected by Covid-19¹¹ and anxieties about filled of EDs was the main factor behind decrease in emergency care-seeking behaviors¹²⁻¹⁵. Consequently, recent studies have found an upsurge in morbidity rates¹⁶. and, in some countries, a significant increase in mortality rate was observed which cannot be completely attributed to Covid-19 infection alone¹⁷. Since the beginning of the pandemic, substantial efforts have been paid to improve understanding of the Covid-19 disease process, prevention, and treatment. Though, which affected the attention on the collateral damage of this pandemic on patients requiring care for other serious illnesses¹⁸.

The current study aimed to assess the impact of COVID-19 pandemic on emergency department admissions rate of surgical consultation patients. The study divided covid-19 pandemic duration into 2019 and 2021 (start and end periods) versus 2020 (peak of the pandemic) for comparing effect. The study showed that less percent of patients attended to ER during 2019 and 2021 were males in comparison to of those who attended during 2020 with statistically significant difference ($P=0.001$). As for categories of surgical consultation Patients visiting Emergency department the study showed that about two-thirds of those who attended at 2019-2021 were regular patients which was higher among those who attended in 2020. A very few percent of eligible patients attended ER during 2019-2021 versus much higher rate during 2020. On the other hand, a higher rate of emergency cases visited ER during 2019-2021 than those who did during 2020 which reflects emergency cases fear of getting infection during the pandemic peak. Additionally, the study showed that nearly one-third of cases admitted during 2019-2021 were for 1 day versus one-fourth of those admitted during 2020 with admission for longer duration during 2019 and 2021 as during 2020 with the peak of the pandemic there were no places / beds for admitting cases due to overuse by pandemic cases besides fear of getting infection made many patients in hurry to be discharged. Similar findings were reported by Balvardi S et al¹⁹. who found that during the covid-19 pandemic, 258 patients visited ED with a GS diagnosis versus 351 patients before the pandemic period. Also, the rate of hospital admission during the pandemic was significantly lower. Patients recorded a significantly shorter ED stay during the pandemic. Operative management during the pandemic were less compared to the pre-pandemic period. Other studies showed reduced overall ED usage by patients due to the Covid-19 pandemic^{13,15,20,21}. Also, İlhan B et al²² reported for 50% reduction in ED visits and a 30% reduction in emergency consultations. A significant reduction in all triage levels of visits and emergency consultations was noticed. In Saudi Arabia, A study showed that there was a 24% reduction in the number of visits for common neurological symptoms during covid-19 time period compared to pre-pandemic²³. Another study by Abdelhadi A et al²⁴ revealed that there was no statistically significant change in the number of patients attending the emergency department between 2018 and 2019, while an obvious reduction was recorded in the number of patients attending the department between 2019 and 2020.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the current study showed that there was a significant drop at the number of patients attended to ED during the peak of covid-19 pandemic due to many fears and also due to lack of beds due to the overuse during the pandemic. Also, not only the number of patients attended was reduced but also their duration of hospital stays especially eligible cases. The community-related effect of this pandemic on ED visits for most cases cannot be ignored therefore, more effort should be paid endorsing different ways to avoid these consequences are in future during any community related emergencies like covid-19 pandemic .

Authorship Contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

Potential Conflicts of Interest: None

Competing Interest: None

Acceptance Date: : 27-06-2023

ACKNOWLEDGMENT

All member of general surgical department and unit of medical record staff of the King Faisal Hospital, Makkah, where the study was done are highly acknowledged.

REFERENCES

1. Mahase, E. Covid-19: WHO declares pandemic because of “alarming levels” of spread, severity, and inaction. *BMJ* 2020;368:m1036.
2. Ciotti M, Ciccozzi M, Terrinoni A, et al. The COVID-19 pandemic. *Crit Rev Clin Lab Sci* 2020;57(6):365-88.
3. Hunter P. The spread of the COVID-19 coronavirus: Health agencies worldwide prepare for the seemingly inevitability of the COVID-19 coronavirus becoming endemic. *EMBO reports* 2020;21(4): e50334.
4. Güner HR, Hasanoğlu İ, Aktaş F. COVID-19: Prevention and control measures in community. *Turkish J Med Sci* 2020;50(9):571-7.
5. Khan A, Alsofayan Y, Alahmari A, et al. COVID-19 in Saudi Arabia: the national health response. *Eastern Mediterranean Health J* 2021;27(11):1114-24.
6. Adjemian J, Hartnett KP, Kite-Powell A, et al. Update: COVID-19 pandemic—associated changes in emergency department visits—United States, December 2020–January 2021. *Morbidity and Mortality Weekly Report*. 2021;70(15):552.
7. Janke AT, Jain S, Hwang U, et al. Emergency department visits for emergent conditions among older adults during the COVID-19 pandemic. *J Am Geriatr Soc* 2021;69(7):1713-21.
8. Kim HS, Cruz DS, Conrardy MJ, et al. Emergency department visits for serious diagnoses during the COVID-19 pandemic. *Acad Emerg Med* 2020 Sep;27(9):910-913.
9. Westgard BC, Morgan MW, Vazquez-Benitez G, et al. An analysis of changes in emergency department visits after a state declaration during the time of COVID-19. *Annals of Emerg Med* 2020;76(5):595-601.
10. Mahmassani D, Tamim H, Makki M, et al. The impact of COVID-19 lockdown measures on ED visits in Lebanon. *Am J Emerg Med* 2021; 46:634-9.
11. Fung TH, Kuet ML, Patel MK, et al. Addressing COVID-19 fear to improve clinic attendance for patients with wet age-related macular degeneration. *Acta Ophthalmologica* 2021;99(2): e285.
12. Li JY, You Z, Wang Q, et al. The epidemic of 2019-novel-coronavirus (2019-nCoV) pneumonia and insights for emerging infectious diseases in the future. *Microbes Infect* 2020 Mar;22(2):80-5.
13. De Filippo O, D’Ascenzo F, Angelini F, et al. Reduced rate of hospital admissions for ACS during Covid-19 outbreak in Northern Italy. *N Engl J Med* 2020;383(1):88-9.

14. Hartnett K, Kite-Powell A, DeVIEWS J, et al. Impact of the COVID-19 pandemic on emergency department visits—United States, January 1, 2019–May 30, 2020. *Centers for Disease Control and Prevention morbidity and mortality weekly report* 69.
15. Metzler B, Siostrzonek P, Binder RK, et al. Decline of acute coronary syndrome admissions in Austria since the outbreak of COVID-19: the pandemic response causes cardiac collateral damage. *European Heart J* 2020;41(19):1852-3.
16. Guo H, Zhou Y, Liu X, et al. The impact of the COVID-19 epidemic on the utilization of emergency dental services. *J Dent Sci* 2020;15(4):564-7.
17. Statistica INd. L'andamento dei decessi del 2020. Dati anticipatori sulla base del sistema ANPR. Italy: Istituto Nazionale di Statistica 2020.
18. Chudasama YV, Gillies CL, Zaccardi F, et al. Impact of COVID-19 on routine care for chronic diseases: a global survey of views from healthcare professionals. *Diabetes Metab Syndr* 2020;14(5):965-7.
19. Balvardi S, Cipolla J, Touma N, et al. Impact of the Covid-19 pandemic on rates of emergency department utilization and hospital admission due to general surgery conditions. *Surg Endosc* 2022;36(9):6751-9.
20. Podda M, Cillara N, Di Saverio S, et al. Antibiotics-first strategy for uncomplicated acute appendicitis in adults is associated with increased rates of peritonitis at surgery. A systematic review with meta-analysis of randomized controlled trials comparing appendectomy and non-operative management with antibiotics. *Surgeon* 2017;15(5):303-14.
21. Tam CC, Cheung KS, Lam S, et al. Impact of coronavirus disease 2019 (COVID-19) outbreak on ST-segment–elevation myocardial infarction care in Hong Kong, China. *Circ Cardiovasc Qual Outcomes* 2020;13(4):e006631.
22. İlhan B, Berikol GB, Dogan H. Impact of COVID-19 outbreak on emergency visits and emergency consultations: a cross-sectional study. *Cureus* 2021;13(3).
23. Bamaga AK, Alharbi O, Bajuaifer M, et al. The effect of the COVID-19 pandemic on emergency department visits for neurological diseases in Saudi Arabia. *Cureus* 2020;12(12).
24. Abdelhadi A. The effects on the number of patients visiting the emergency units: comparison study before and during COVID-19 pandemic in Saudi Arabia. *J Multidisciplinary Healthcare* 2021;14:1207.