

# Does social isolation cause secondary injury in general surgery patients?

## Sosyal izolasyon, genel cerrahi hastalarında ikincil hasara neden olur mu?

Emre Karakaya<sup>1</sup>, Aydınca Akdur<sup>1</sup>, Tefik Avcı<sup>1</sup>, Halil İbrahim Taşçı<sup>1</sup>, Nazlı Gülsoy Kırnıp<sup>2</sup>

<sup>1</sup> Baskent University Faculty of Medicine,  
Department of General Surgery, Ankara, Turkey  
<sup>2</sup> Baskent University Faculty of Medicine,  
Department of Endocrinology and Metabolic  
Diseases, Ankara, Turkey

### ORCID ID of the author(s)

EK: 0000-0002-4879-7974  
AA: 0000-0002-8726-3369  
TA: 0000-0001-5225-959X  
HAT: 0000-0003-2269-4798  
NGK: 0000-0001-7103-9963

### Abstract

**Aim:** Social isolation during the pandemic has been reported to cause secondary injury to some patient groups. The fear of secondary injury causes patients and health workers to ignore rules of social isolation. Here we aimed to evaluate secondary injury among general surgery patients during the pandemic.

**Methods:** In this retrospective cross-sectional study, 279 patients, consulted from emergency departments to general surgery departments at Başkent University Ankara and Konya Research Centers, were analyzed. The patients were divided into two groups according to admission periods (Group 1: March 01 - May 01, 2019; n=163, Group 2: March 01 - May 01, 2020; n=116).

**Results:** The mean age of Group 2 (50.4 (19.3)) was less than Group 1 (55.4 (20.4)). Gender ( $P=0.28$ ), malignancy ( $P=0.53$ ), comorbidity ( $P=0.27$ ) distributions were similar. There was no significant difference in terms of admission complaints ( $P=0.88$ ) and complaint durations ( $P=0.068$ ). Acute cholecystitis rate was significantly higher in Group 2 ( $P=0.005$ ), and the rate of non-specific patients was significantly higher in Group 1 ( $P=0.003$ ). Hospitalization ( $P=0.46$ ), type of treatment ( $P=0.3$ ), surgical procedure ( $P=0.27$ ), length of stay ( $P=0.66$ ) and mortality rate ( $P=0.5$ ) were similar.

**Conclusion:** Our results showed no secondary injury to general surgery patients due to the pandemic. During this period, social isolation did not decrease the hospital admission of critically ill patients.

**Keywords:** Pandemics, Mortality, COVID-19

### Öz

**Amaç:** Pandemi dönemlerinde uygulanan sosyal izolasyonun bazı hasta gruplarında ikincil hasara neden olduğunu gösteren yayımlar mevcuttur. İkincil hasar gelişebileceği korkusu ile hastalar ve hekimler tarafından sosyal izolasyon kurallarına aykırı tavırlar gösterilebilmektedir. Çalışmadaki amacımız; COVID-19 pandemisi sırasında Türkiye’de uygulanan sosyal izolasyonun, genel cerrahi hastalarında meydana getirdiği ikincil hasarları değerlendirmektir.

**Yöntemler:** Başkent Üniversitesi Ankara ve Konya Uygulama ve Araştırma Merkezleri erişkin acil servisinden genel cerrahi bölümüne konsülte edilen 279 hasta retrospektif olarak incelendi. Hastalar başvuru dönemine göre iki gruba ayrıldı (Grup 1: 01 Mart - 01 Mayıs 2019; n=163, Grup 2: 01 Mart - 01 Mayıs 2020; n=116). Hastaların demografik karakteristikleri, klinik bilgileri ve tedavi özellikleri hastane otomasyon sistemi aracılığı ile kayıt edilerek her iki grup karşılaştırıldı.

**Bulgular:** Grup 2’nin yaş ortalaması (50,4 (19,3)), grup 1 (55,4 (20,4))’e göre daha düşüktü ve bu düşüş istatistiksel olarak anlamlıydı ( $P=0,038$ ). Grupların cinsiyet ( $P=0,28$ ), malignite ( $P=0,53$ ), komorbidite ( $P=0,27$ ) dağılımları benzerdi. Gruplar arasında başvuru şikayetleri ( $P=0,88$ ) ve şikayet süreleri ( $P=0,068$ ) açısından anlamlı fark saptanmadı. Grupların tanıları karşılaştırıldığında Grup 2’de akut kolesistit oranı anlamlı olarak daha yüksek tespit edildi ( $P=0,005$ ). Ayrıca non-spesifik hasta oranı grup 1’de anlamlı olarak daha fazla idi ( $P=0,003$ ). Gruplar arasında hospitalizasyon ( $P=0,46$ ), tedavi şekli ( $P=0,3$ ), yapılan cerrahi prosedür ( $P=0,27$ ), yatış süresi ( $P=0,66$ ) ve mortalite oranı ( $P=0,5$ ) açısından istatistiksel olarak anlamlı bir fark saptanmadı.

**Sonuç:** Yaptığımız araştırma sonuçlarına göre merkezimize başvuran hastalarda sosyal izolasyona bağlı gelişen ikincil hasarlanma ile karşılaşmadık. Bu dönemde hastaların sosyal izolasyonda olmaları ciddi klinik problemleri var için hastaneye başvurularını azaltmamız sadece gereksiz acil başvurusu sayısını azaltmıştır.

**Anahtar kelimeler:** Pandemi, Mortalite, COVID-19

Corresponding author/Sorumlu yazar:

Emre Karakaya

Address/Adres: Başkent Üniversitesi Tıp Fakültesi  
Ankara Uygulama ve Araştırma Hastanesi, Yukarı  
Bahçelievler, Mareşal Fevzi Çakmak Cd. No:45,  
06490 Çankaya, Ankara, Türkiye  
E-mail: dremrekarakaya@gmail.com

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## Introduction

COVID-19 has spread all around the world within a brief time after its emergence and was declared a pandemic by the World Health Organization (WHO) on 12 March 2020 [1,2]. A number of measures concerning public health, economic, and sociocultural fields have been taken in countries affected by the disease. Social isolation forms the basis of those measures [3]. It is the most effective method that slows the spread of the disease. Several studies have shown that social isolation process leads to secondary injury in some patient groups [4,5]. No study has yet investigated the impact of social isolation from the viewpoint of general surgery. The present study aimed to examine social isolation's effects concerning general surgery by comparing patients consulted with the general surgery department by the emergency department at our center during the pandemic with patients consulted within the preceding period.

## Materials and methods

Our study was approved by Başkent University Medicine and Health Sciences Research Committee (Date 02/06/2020, No KA20/212). It enrolled a total of 279 patients who were consulted by the Adult Emergency Department with the General Surgery Department at Başkent University Ankara and Konya Practice and Research Centers. Since the symptoms and diagnoses of patients presenting to the Emergency Department may show seasonal variations, the data from the spring of 2019 were chosen to be compared with the data from the pandemic. The patients were divided into two groups according to their date of presentation (Group 1: 01 March - 01 May 2019; Group 2: 01 March - 01 May 2020). A cross-sectional study was conducted by retrospectively reviewing the patients' data regarding their demographic features, comorbidities, admission complaints, duration of symptoms, diagnoses, consultation results, treatment modalities, applied treatments, length of hospital stay, and mortality rates from the hospital automation system. To perform a more accurate statistical analysis, the patients' admission complaints were grouped under 5 main titles (Table 1). Their diagnoses were encoded by ICD-10 diagnostic codes and grouped accordingly (Table 2) [6]. Patients who remained undiagnosed after the assessment were recorded as having a "non-specific diagnosis". Surgical procedures were grouped according to the interventional procedures list issued by R.T. Ministry of Health [7]. Again, to perform an accurate statistical analysis, the surgical procedures were grouped under certain titles (Table 3). The patients who were consulted with another department after a physical examination and diagnostic tests were separately grouped.

### Statistical analysis

The statistical analysis of the study data was conducted using SPSS version 25.0 statistical software. The normality of data distribution was tested using the Kolmogorov-Smirnov test and the Shapiro-Wilk test. Data without normal distribution were expressed as mean and compared using the Mann Whitney-U test. Categorical data were compared using Chi-square or Fisher's exact test. A *P*-value of less than 0.05 was considered statistically significant for all statistical analyses.

Table 1: Distribution of the patient complaints

Complaint	Group 1 n (%)	Group 2 n (%)
Abdominal pain (with or without nausea and vomiting)	148 (90.8)	109 (94)
Inguinal pain	5 (3.1)	2 (1.7)
Anal pain	3 (1.8)	1 (0.9)
Bloody emesis, bloody stool	3 (1.8)	2 (1.7)
Traffic accident, fight related injuries	4 (2.5)	2 (1.7)

Table 2: Patient diagnoses and ICD-10 diagnostic codes

ICD-10 CODE	Diagnosis	Group 1 n (%)	Group 2 n (%)	<i>P</i> -value
	Non-specific	41 (25.2)	12 (10.3)	0.003
K35	Acute appendicitis	29 (17.8)	27 (23.3)	NS*
K81	Cholecystitis	22 (13.5)	32 (27.6)	0.005
K56	Paralytic ileus and intestinal obstruction without hernia	20 (12.3)	11 (9.5)	NS*
K52	Other non-infective gastroenteritis and colitis	13 (8)	11 (9.5)	NS*
K57.3	Diverticular disease of large intestine without perforation or abscess	7 (4.3)	5 (4.3)	NS*
K40-K46	Hernia	8 (4.9)	3 (3.6)	NS*
N83	Non-inflammatory disorders of ovary, fallopian tube and broad ligament	5 (3.1)	1 (0.9)	NS*
K85	Acute pancreatitis	4 (2.5)	2 (1.7)	NS*
K60	Fissure and fistula of anal and rectal regions	1 (0.6)	0 (0)	NS*
K61	Abscess of anal and rectal regions	2 (1.2)	1 (0.9)	NS*
K64	Hemorrhoids and perianal venous thrombosis	2 (1.2)	1 (0.9)	NS*
C51-C58	Malignant neoplasms of female genital organs	2 (1.2)	1 (0.9)	NS*
C15-C26	Malignant neoplasms of digestive organs	2 (1.2)	3 (2.6)	NS*
K92.2	Gastrointestinal hemorrhage, unspecified	1 (0.6)	3 (2.6)	NS*
K55.0	Acute vascular disorders of intestine	1 (0.6)	0 (0)	NS*
S36	Injury of intra-abdominal organs	1 (0.6)	1 (0.9)	NS*
K27.1	Peptic ulcer, site unspecified, acute with perforation	0 (0)	1 (0.9)	NS*
K63.1	Perforation of intestine (non-traumatic)	0 (0)	1 (0.9)	NS*

NS\* not significant

Table 3: Distribution of the surgical procedures performed in the patients

Surgical procedure	Group 1 n (%)	Group 2 n (%)
No surgery (medical treatment), n (%)	122 (74.8)	77 (66.4)
Appendectomy (open and laparoscopic), n (%)	24 (14.7)	27 (23.3)
Resection of small intestine, Colectomy, n (%)	7 (4.3)	2 (1.7)
Cholecystectomy (open and laparoscopic), n (%)	4 (2.5)	5 (4.3)
Abscess drainage, n (%)	3 (1.8)	1 (0.9)
Hernia repair (inguinal, umbilical, incisional), n (%)	3 (1.8)	2 (1.7)
Exploratory laparotomy, n (%)	0 (0)	1 (0.9)
Repair for perforated peptic ulcer disease, n (%)	0 (0)	1 (0.9)

## Results

In our study, 163 patients in Group 1 and 116 patients in Group 2 were consulted with the department of general surgery. Table 4 summarizes various characteristics of the patients in both study groups. Accordingly, the mean age of the patients in Group 2 was significantly lower than that of patients in Group 1 (50.4(19.3) vs 55.4(20.4), *P*=0.038). Both groups of patients had statistically comparable distributions of gender (*P*=0.28), symptom duration (*P*=0.068), malignancy (*P*=0.53), and comorbidities (*P*=0.27).

The most common admission complaint in both groups was abdominal pain, which showed no statistically significant difference between the two groups (*P*=0.88). An analysis of the diagnoses showed that there was a significant difference between both groups concerning the "non-specific" and "cholecystitis" diagnoses. The rate of non-specific diagnoses was 25.2% (n=41) in Group 1 while it dropped to 10.3% (n=12) in Group 2 (*P*=0.003). The rate of acute cholecystitis was 13.5% (n=22) in Group 1 while it rose to 27.6% (n=32) in Group 2 (*P*=0.005). The results of the consultations showed no significant differences between both groups in terms of hospital admission, discharge, consultation with another department, and treatment refusal (*P*=0.46). Both groups had statistically similar proportions of patients treated medically or surgically (*P*=0.3). The distribution of surgical procedures was similar in both groups (*P*=0.27). No significant difference was found between the two groups with regards to the duration of hospital stay (*P*=0.66). The mortality

rate of Group 1 was 2.5% (n=4) while it dropped to 1.7% (n=2) in Group 2, but the difference was insignificant ( $P=0.5$ ) (Table 4).

Table 4: The patients' demographic and clinical characteristics

	Group 1 (n:163)	Group 2 (n=116)	P-value
Age, year, mean (SD)	55.4 (20.4)	50.4 (19.3)	0.038
Gender			0.28
Male, n (%)	78 (47.9)	63 (54.3)	
Female, n (%)	85 (52.1)	53 (45.7)	
Duration of symptom, day, mean (min-max)	1 (0-60)	2 (1-20)	0.068
Malignancy, n (%)	32 (19.6)	19 (16.4)	
Comorbidity, n (%)	84 (51.5)	52 (44.8)	
Results			0.46
Hospitalize	87 (54.3)	73 (62.9)	
Discharge	54 (33.1)	31 (26.7)	
Consultation to the other departments	3 (1.8)	2 (1.7)	
Refusal of Treatment	19 (11.7)	10 (8.6)	
Type of treatment			0.3
Surgical treatment	103 (63.2)	65 (56)	
Medical treatment	41 (25.2)	39 (33.6)	
Length of stay, day, mean (min-max)	3 (1-46)	3 (1-19)	NS*
Death	4 (2.5)	2 (1.7)	NS*

NS\* not significant

## Discussion

During the COVID-19 pandemic, taking certain measures has become obligatory in the field of public health as in many other fields. In the current literature, it is recommended for patients to avoid hospital presentation and for surgeons to postpone elective surgical procedures [8,9]. Taking the recommended measures has brought about the possibility of delayed diagnosis and treatment, potentially increasing mortality, and morbidity rates [4,5].

It is well-known that COVID-19's mortality rises in advanced age. Therefore, studies have stressed that aged individuals should take extra care to socially isolate themselves [10]. In our study, the mean age of the patients significantly dropped in Group 2 (50.4(19.3)) compared to Group 1 (55.4(20.4)). We believe that the aged population taking greater care for social isolation caused this difference.

A study that was reported by Kılınc et al. [11] in 2009 examined gender and age distribution of patients presenting to the emergency department. It revealed that, among individuals aged 65 years or older, women more commonly presented to the emergency department. Although our study did not find any significant differences concerning gender between the study groups, Group 2 contained more men than Group 1. This may stem from a lower mean age in Group 2 than Group 1.

As is known, COVID-19 has a more severe course in patients with immunosuppression or comorbidities such as hypertension, and the mortality rate rises as high as 8% in such groups [12]. Despite the differences being statistically non-significant, Group 2 had a 3.2% lower malignancy rate and a 6.7% lower comorbidity rate than Group 1. This finding may be a sign that patients with malignancy or comorbidities have adapted to social isolation.

In our country, patients can easily access emergency departments of tertiary health centers. Therefore, patients generally prefer to present to emergency departments rather than visiting their family physicians or outpatient clinics. According to several studies, about 10-12% of patients presenting to emergency departments with abdominal pain do not receive any diagnosis [13,14]. In our study, the corresponding rate was 25.2% in Group 1 and 10.3% in Group 2, with both numbers being above the other countries' average numbers. A comparison

of Group 1 and Group 2, on the other hand, reveals a drop as much as 14.9% in Group 2, which was statistically significant. In our opinion, this drop originates from a reduced number of unnecessary presentations to the emergency department due to social isolation during the pandemic.

Acute cholecystitis constitutes a considerable percentage of general surgical emergencies, and its definitive treatment is cholecystectomy. However, some uncomplicated acute cholecystitis cases may be treated with antibiotics as a bridge to cholecystectomy [15]. In our study, the number of patients who were diagnosed with acute cholecystitis significantly increased in Group 2 compared with those in Group 1. However, no significant difference was found between the cholecystectomy rates of both groups. Many studies to date have recommended postponing elective surgeries during the pandemic [8,9]. We also opted to postpone surgery and administered first-line medical treatment in patients with uncomplicated acute cholecystitis.

Overcrowding in emergency departments may cause a sense of dissatisfaction in some patients, making them refuse treatment at their own will [16]. From a standpoint of general surgery, fear of undergoing a surgical procedure may be another reason for patients to leave the emergency department. According to our findings, there was a 1.4% non-significant drop in the number of patients refusing treatment in Group 2. We believe that this drop resulted from the relief of the emergency department's overcrowding and the preference of medical therapy during the pandemic.

## Limitations

Small study size and collection of study data from two centers from the same region may be considered as the limitations of our study. The study may be extended by collecting data from a larger number of patients from different geographical regions. Additionally, a study enrolling outpatients may achieve more statistically significant results.

## Conclusion

In our study, our results showed no secondary injury to general surgery patients due to the pandemic. During this period, social isolation did not decrease the hospital admission of critically ill patients. However, the pandemic decreased the unnecessary admissions to emergency clinic. We also showed that with precautions, urgent surgical cases can be successfully managed during the pandemic.

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