ORIGINAL ARTICLE

How did the general surgeons intend to treat acute calculous cholecystitis during COVID-19 era? Results of online survey

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ABSTRACT

BACKGROUND: Acute calculous cholecystitis is one of the most encountered surgical pathologies. While early cholecystectomy is the first treatment choice during the first index hospitalization, it may change during COVID-19 era when hospital resources are restricted, and health-care personnel try to overcome pandemic difficulties. In this survey, our aim is to investigate surgeons' preferences and possible changing paradigms for acute cholecystitis therapy during COVID-19 pandemic.

METHODS: An online survey was conducted on an internet site through private invitation by social media sent to general surgeons. The survey consisted of 13 questions, including surgeons' hospital properties, and it questioned treatment preferences against acute calculous cholecystitis during the pandemic. After 3 months of data collection, responded answers were analyzed statistically.

RESULTS: About 56% of the surgeons stated that their treatment strategy changed during the COVID-19 pandemic partially or totally. About 48.8% of surgeons preferred early cholecystectomy for cases with acute cholecystitis before COVID-19 era; when only 23.2% of the surgeons preferred early surgery during COVID-19 era. However, patients who had received antibiotics as primary medical therapy had medical therapy failure with a range of 40.2%. Percutaneous cholecystostomy rate was raised to 20.7% from 4.9% before the COVID era.

CONCLUSION: Although 96.3% of the surgeons did not have seen any unusual complication related to the COVID-19 disease, more than half of the surgeons who preferred early cholecystectomy changed their treatment strategy during the COVID-19 pandemic. According to the survey results, although the medical therapy failure rate is high, 48.8% of the surgeons may persist in this non-operative approach after the pandemic.

Keywords: Acute calculous cholecystitis; antibiotherapy; COVID-19; laparoscopic cholecystectomy.

INTRODUCTION

Since the World Health Organization declared COVID-19 as a worldwide pandemic in early 2020, the disease burden to the health-care services resulted in several changes in medical and therapeutic approaches. The elective surgeries have been canceled in that era; even some oncological and emergency surgeries have been arranged according to the necessity of the procedure according to the guidelines and recommendations of the surgical societies.[1]

Acute cholecystitis is one of the most encountered surgical diseases in emergency settings as laparoscopic cholecystectomy is the gold standard surgical approach.[2] As surgery has been widely performed in emergency laparoscopic settings, laparoscopic cholecystectomy has been questioned during that time. The early concerns about the effect of surgical smoke may lead to the spread of the viral disease and give potential harm to the surgical team when there is not any documented evidence for viral spread through this route.[3]

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Due to the COVID-19 lockdown period, acute calculous cholecystitis incidence has been increased statistically when acute care surgeries, including acute cholecystitis, have been decreased.[4]

When surgical societies still recommended early laparoscopic cholecystectomy, many hospitals used most of the facilities as pandemic institutions.[5]

Our primary aim in this study was to reveal the effect of the COVID-19 pandemic on surgeons' therapeutic preferences for acute calculous cholecystitis cases.

MATERIALS AND METHODS

An online survey was conducted for general surgeons by invitation through a closed social media platform after approval of the local ethical committee. Eighty-two surgeons participated in the study during 3 months data collection period between May 2021 and July 2021. Informed consent was taken before participating in the study. The language of the survey was Turkish. The survey consisted of 13 questions.

Surgeons consultancy year, surgeons hospital academic properties, their hospitals pandemic status, and treatment strategy of the acute calculous cholecystitis before and during the pandemic were questioned. The rationale behind the preferred treatment by the surgeons was also questioned. Surgeons' diagnostic modalities for excluding the COVID-19 disease of acute cholecystitis patients and the effect of COVID-19 status of the patient's therapy selected by the surgeons were questioned. Patients who received antibiotherapy as primary treatment and whose therapy failed and needed to have surgery early 1 month were reported. Surgeons' treatment strategies for those non-operative treatment failure groups were questioned. Surgeons were asked about complications of acute calculous cholecystitis related to COVID-19 disease. As the last question, it is asked to surgeons as if they may change their treatment strategy after COVID-19 pandemic when they have changed it during COVID-19 era.

The study findings were statistically analyzed using the IBM SPSS (Statistical Package for the Social Sciences) Statistics 20 program. Notably, frequency tables, descriptive statistics, and pie and bar charts were used.

RESULTS

Table 1 shows the participant consultant surgeons' experience at general surgery, academic properties, and COVID-19 pandemic status in the hospital.

About 56% of the surgeons stated that their treatment strategy had been changed during COVID-19 pandemic to some degree (28% partially and 28% totally) (Fig. 1). When the general surgery specialists who changed their treatment approach were asked about the reason, the majority of them answered insufficient bed/equipment due to the intensity of the pandemic in the hospital (20.7%). The other most-cited reason is the possibility of the COVID-19 virus to the patient or themself (9.8%). Recommendations of surgical societies and literature were the rationale at 8.5% of the surgeons, and personal belief is stated as 8.5% for surgeons. The other causes are considered 7.3% (43 surgeons have answered this question).

About 50% of the surgeons had ordered tests to exclude COVID-19 in patients with acute calculous cholecystitis and requested PCR, thorax CT, and additional blood tests. On the other hand, 28% had examinations only if there were suspi-

Table 1. Descriptive data of participant surgeons and hospital properties

Variable	Categories	n	%
Participant surgeons experience at general surgery (years)	0–5	22	26.8
	6–10	14	17.1
	11–15	16	19.5
	16–20	10	12.2
	20 and more year	20	24.4
Hospital properties of the participant surgeons	State hospital	30	36.6
	State-affiliated research and education hospital	15	18.3
	Private clinic	4	4.9
	Private hospital	16	19.5
	Private university hospital	2	2.4
	State affliated university hospital	15	18.3
Hospital's pandemic status	Yes	58	70.7
	No	24	29.3

Table 2. Surgeons treatment preferences of acute calculous cholecystitis before and during the COVID 19 pandemic

	Frequency (n)	%
Before pandemic		
Early cholecystectomy or interval cholecystectomy after 7 days	40	48.8
Cholecystectomy whatever the time	8	9.8
Medical therapy and as if it fails surgery	23	28
Medical therapy and as if it fails percutaneous drainage	4	4.9
Surgery or percutaneous drainage according to the case	3	3.7
Oral/iv antibiotherapy without hospitalization	4	4.9
During pandemic		
Early cholecystectomy or interval cholecystectomy after 7 days	19	23.2
Cholecystectomy whatever the time	4	4.9
Medical therapy and as if it fails surgery	29	35.4
Medical therapy and as if it fails percutaneous drainage	17	20.7
Surgery or percutaneous drainage according to the case	9	11
Oral/iv antibiotherapy without hospitalization	4	4.9

Table 3. Surgeons treatment preferences after medical therapy failure

Treatment modality	Frequency (n)	%
Laparoscopic/open surgery	30	78.9
Change of the antibiotics and consultation to the interventional radiologist	4	10.5
Change of the antibiotics only	2	5.3
Other	2	5.3

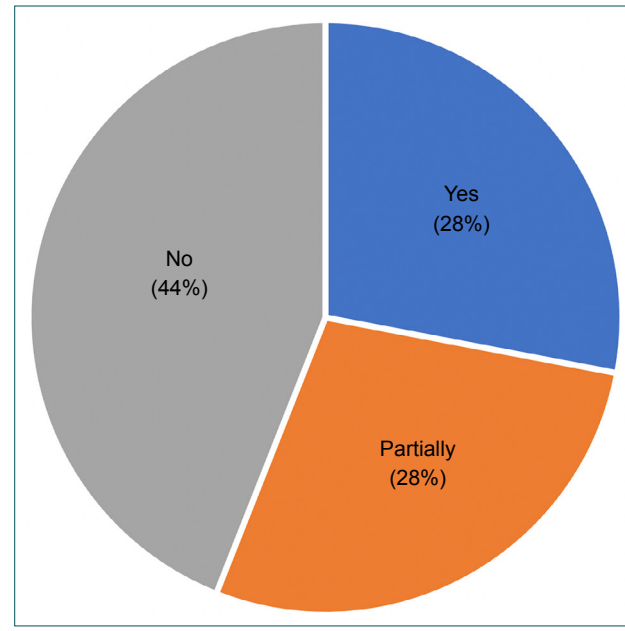

Figure 1. Surgeons' changing treatment strategy for acute calculous cholecystitis during the pandemic.

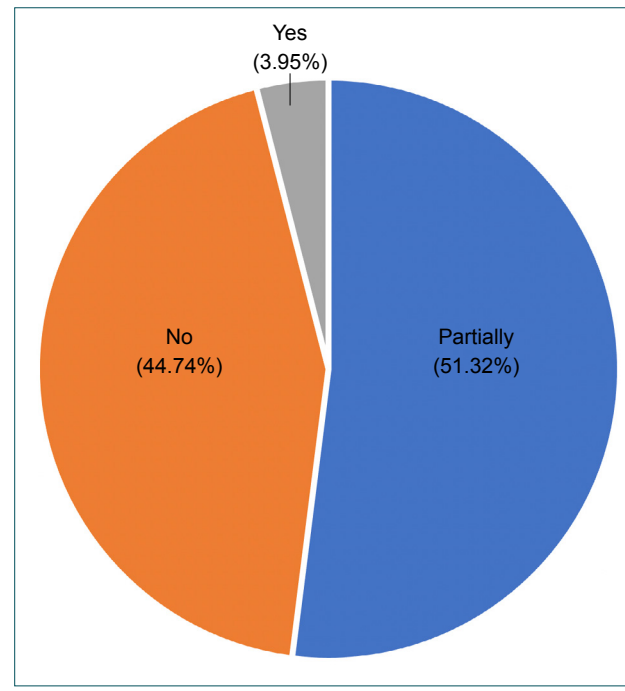

Figure 2. Surgeons' possible changing treatment modality for acute calculous cholecystitis after COVID-19 pandemic.

cious findings for COVID-19 when 12.2% of the surgeons had been ordered thorax CT to exclude COVID-19. Only 3.7% of the surgeons did not order any test to exclude COVID-19. While 48% of the 82 general surgeons participating in the study may change their treatment approach in the case of COVID-19 positivity in acute calculous cholecystitis patients; however, 41.5% of them stated that it might vary according to the severity COVID-19 disease or acute calculous cholecystitis. The remaining surgeons said that they would not change their treatment strategy according to the COVID-19 status of the patient (9.7%).

About 48.8% of surgeons preferred early cholecystectomy for cases with acute calculous cholecystitis before COVID-19; when only 23.2% of the surgeons preferred early surgery during COVID-19. Furthermore, according to our survey results, the percutaneous cholecystostomy (PC) rate was raised to 20.7% from 4.9% before the COVID era (Table 2).

Surgeons stated that patients who had received antibiotics as primary medical therapy had medical therapy failure with a range of 40.7% (n=33) during the COVID era (n=33). After treatment failure, 78.9% of the patients underwent surgery when the remaining surgeon's approach was modalities, including other antibiotics and interventional radiology consultation (Table 3).

About 96.3% of the patients with acute calculous cholecystitis did not have any unusual complication related to COVID-19 disease, according to the surgeon's answers.

Surgeons answers revealed that 48.6% of the surgeons might change their approach to acute cholecystitis after COVID-19 pandemic partially or totally (44.7% and 3.9%) (Fig. 2).

DISCUSSION

COVID-19 pandemic has resulted in an additional burden on surgical services; most elective surgeries, including cholecystectomies, have been canceled. Complications related to symptomatic cholelithiasis are 1–3% annually so the delay in elective cholecystectomies may cause more advanced cases with acute cholecystitis.[6]

Acute cholecystitis is first an inflammatory disease, but secondary bacterial infection may progress after biliary obstruction of the cystic duct. Antibiotics are an integral part of supportive medical therapy and may be an option during the first period of acute cholecystitis, but relapse is common after antibiotherapy alone.[7] Hence, early international guidelines during pandemic have recommended a non-operative strategy for cholecystitis. However, early laparoscopic cholecystectomy has several documented benefits over interval cholecystectomy like the decreased length of stay, readmissions for disease-related morbidity, earlier return to work, improved quality of life, and increased cost-effectiveness.[8]

Surgeons' answers revealed that 70.7% of the surgeons (n=58) have been working in a pandemic hospital where the daily surgical practice has been changed to a degree related to the use of local resources for pandemic status.

Surgeons' treatment preference for acute cholecystitis has changed partially or totally during pandemic (28% and 28%, respectively). The rationale behind this approach has been mainly related to the COVID-19-negative impact on local resources and possible transmission risk to the health-care personnel and the patient compatible with the results. As stated in the literature, emergency surgery in COVID-19 patients has higher morbidity and mortality. Hence, postponing the non-urgent procedures should be prioritized, and non-operative treatment for several diseases may be considered unique for this era.[9]

While most surgeons stated that they had ordered any test to exclude COVID-19 in patients with acute calculous cholecystitis, only 3.7% did not contain any difficulty. Since acute cholecystitis may be regarded as a semi-urgent condition and preoperative COVID-19 diagnostic testing is related to several factors, including local recommendations of health authorities availability of the resources for each institution, the indications for excluding COVID-19 before surgery would include patients with active symptoms or patients at the high-risk group.[8]

One of the prominent findings of the survey is that 48% of the general surgeons may change their treatment approach in case of COVID-19 positivity in acute calculous cholecystitis patients; however, 41.5% of them stated that it may vary according to the severity of COVID-19 disease or acute cholecystitis. It seems that surgeons primarily have used the "do not harm approach" before any decisive movement during COVID-19 pandemic.[7]

About 48.8% of surgeons preferred early cholecystectomy for cases with acute cholecystitis before COVID-19 era; when only 23.2% of the surgeons preferred early surgery during COVID-19 era. While early cholecystectomy is highly preferable with a high level of evidence, a chaotic pandemic era might highly affect the surgeon's approach. This result is quite similar to the survey study conducted in Singapore, while early cholecystectomy at index admission was declined to 66.7% from 92.32% due to pandemic.[8] Non-traumatic surgical emergencies have made the surgical decision-making process more important during pandemics. Surgical societies have established advantages and disadvantages for operative and non-operative approaches to non-traumatic cases to relieve health-care facilities. For acute cholecystitis, even during the pandemic, early cholecystectomy seems to have more benefits than the non-operative approach.[10] Differences and difficulties between countries have led to different results of studies conducted during pandemics. Patients with cholelithiasis did not change elective cholecystectomy timing in Spain. At the same time, surgeons in Singapore stated that they mainly had changed the treatment strategy of non-complicated calculous cholecystitis during the pandemic.[6,8] Although treatment preferences for acute cholecystitis have changed drastically during the pandemic, the non-operative approach did not show promise enough. Our survey results revealed that the patients who had received antibiotics as primary medical therapy had medical therapy failure with a range of 40.2% during the COVID era. After treatment failure, 53.7% of the patients underwent surgery. This result is compatible with literature in which primary antibiotics for acute cholecystitis have high treatment failure.[7] In addition, the conservative management led to a high rate of readmission. At the same time, delayed cholecystectomy was associated with increased operative difficulties related to adhesions, higher blood loss, and/or complicated gallbladder pathologies, and more importantly with a longer hospital stay, which is the most undesirable during a pandemic so early cholecystectomy might be recommended even with attributable risks related to COVID-19 in the majority of the cases.[11]

Before the pandemic era, PC was preferred by only 4.9% of the surgeons while during the pandemic as 20.7% of the participant surgeons according to our survey results.

The main alternative as non-operative therapies for acute cholecystitis is antibiotherapy, PC, or a combination of these therapies. Before the COVID-19 pandemic, PC may be reserved for the elderly patient with comorbidities of patients with prohibitive surgical risk and performed after failure of the antibiotherapy and sometimes as a bridge therapy before surgery.[5] During the COVID-19 pandemic, several studies have supported this approach. As pulmonary complications related to COVID-19 are a possible concern for general anesthesia during cholecystectomy, PC can be performed under local anesthesia and act as a primary alternative therapy for surgery, according to the studies conducted in Turkey.[12] In addition, the length of the stay between groups that separately had undergone PC, antibiotherapy, or surgery did not show statistical significance.[13] Although relatively few surgeons in our survey have preferred the PC during pandemic, some of them have been working in rural hospitals without interventional radiology units, and the PC use is higher than pre-COVID-19 period.

Surgeons' answers also have shown that 96.3% of the patients who underwent surgery for acute cholecystitis did not have any unusual complication related to COVID-19 disease. While the gastrointestinal system is the second highest viral load resource for COVID-19, the transmission risk through the peritoneal cavity during minimally invasive surgery did not have any evidence yet. The theoretical risk of viral transmission of COVID-19 led to laparoscopic gastrointestinal surgeries, a challenging procedure. Several surgical societies have recommended using a closed smoke evacuation/filtration system with ULPA filtration to diminish a possible viral transmission.[14] However, a few surgical centers in our country have such a device for smoke filtration, which may be another concern about early laparoscopic cholecystectomy. Similarly, in Singapore, 13.7% of the surgeons would prefer open cholecystectomy for such a concern.[8]

The survey's last question revealed that 48.8% of the surgeons might change their treatment approach to the acute cholecystitis after the COVID-19 pandemic partially or totally (47.6% and 7.9%). Although the COVID-19 pandemic still has been shown to have a negative impact worldwide to some degree, the changing paradigm during the pandemic might cause additional morbidity related to late cholecystectomy. Nevertheless, this possible harm has to be cleared up after the pandemic.

Strengths and Limitations

This is the first study in Turkey that analyzed the general surgeons' approach to acute cholecystitis during the COVID-19 era. It is also one of the first few studies worldwide. This study has several limitations. Limited participant surgeons from only one country did not show the accurate changing treatment modality against acute cholecystitis when 70% of the participant surgeons worked in pandemic hospitals. According to the survey results, the changing paradigm that prioritized the non-operative approach may be temporary and highly affected by the local health environmental factors.

Conclusion

Participating surgeons may be adapted to a more non-operative approach for acute cholecystitis during the COVID-19 pandemic when most of them have been working in a pandemic hospital. Contrary to the evidence in the literature, which still favored the surgical approach for acute cholecystitis in COVID-19 era, survey results revealed that the non-operative approach even had been carried forward after the pandemic.

Ethics Committee Approval: This study was approved by the Kutahya Health Sciences University Non-interventional Clinical Research Ethics Committee (Date: 31.03.2021, Decision No: 2021/06-14).

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ORİJİNAL ÇALIŞMA - *ÖZ*

Genel cerrahlar akut taşlı kolesistiti COVID-19 döneminde nasıl tedavi ettiler? Online anket sonuçları

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AMAÇ: Akut taşlı kolesistit en sık karşılaşılan cerrahi patolojilerden biridir. Akut taşlı kolesistit tanısıyla ilk yatış sırasında erken kolesistektomi ilk tedavi seçeneği iken, hastane kaynaklarının kısıtlı olduğu ve sağlık personelinin pandemi zorluklarının üstesinden gelmeye çalıştığı COVID-19 döneminde yaklaşım değişebilir. Bu ankette amacımız, COVID-19 pandemisi sırasında akut taşlı kolesistit tedavisi için genel cerrahların tercihlerini ve olası değişen paradigmayı araştırmaktır.
GEREÇ VE YÖNTEM: Cerrahlara özel kapalı bir sosyal medya grubunda paylaşılan anket linki üzerinden online anket yapılmıştır. Genel cerrahların mesleki deneyimi, çalıştıkları kurum özellikleri ile birlikte COVID-19 dönemindeki akut taşlı kolesistit hastalığına yönelik tedavi tutumları 13 soruluk anket aracılığıyla çoktan seçmeli sorularla sorgulandı. Üç aylık veri toplama dönemi sonrası elde edilen cevaplar istatistiksel olarak analiz edildi.
BULGULAR: Çalışmaya katılan 82 genel cerrahın %56'sı COVID-19 pandemisi sırasında tedavi stratejilerinin kısmen veya tamamen değiştiğini ifade etmiştir. Cerrahların %48.8'i COVID-19 döneminden önce akut taşlı kolesistitli olgularda erken kolesistektomiyi tercih ederken; COVID-19 döneminde cerrahların sadece %23.2'si erken cerrahi yaklaşımı tercih ettiklerini ifade ettiler. Ancak birincil tıbbi tedavi olarak antibiyotik başlanan hastalarda tıbbi tedavi başarısızlığı %40.2 olarak tespit edildi. Anket sonuçlarımıza göre perkütan kolesistostomi uygulaması COVID öncesi dönemde %4.9 iken, pandemi döneminde %20.7'ye yükseltilmiştir.
TARTIŞMA: Cerrahların %96.3'ü COVID-19 hastalığına bağlı bir komplikasyon görmemesine rağmen; COVID-19 pandemisi öncesi erken kolesistektomiyi tercih eden cerrahların yarısından fazlası COVID-19 pandemisi sırasında tedavi stratejilerini değiştirmiştir. Anket sonuçlarına göre tıbbi tedavi başarısızlık oranı yüksek olmasına rağmen, cerrahların %48.8'i pandemi sonrasında da bu non-operatif yaklaşıma devam edebileceklerini ifade etmiştir.
Anahtar sözcükler: COVID-19; akut taşlı kolesistit; antibiyoterapi; laparoskopik kolesistektomi.

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