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Prevalence of complicated cholecystitis during COVID-19 pandemic time in a second level hospital

Prevalencia de colecistitis complicada durante el tiempo de la pandemia por COVID-19 en un hospital de segundo nivel

Mauricio Muñoz-Muñoz,* Michelle G Macías-Rodríguez,* Sergio I Castañeda-Rocha,* Mariana A Torres-Ramírez*

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Palabras clave:
colecistitis, colelitiasis, piocolecisto, hidrocolecistolitiasis.

ABSTRACT

Introduction: acute cholecystitis is an inflammation of the gallbladder, secondary to obstruction in most cases. **Objective:** to determine the prevalence of complicated cholecystitis. **Material and methods:** a descriptive, cross-sectional and observational study was performed; records of 73 patients operated on for acute cholecystitis during January 2020 to February 2021 were collected to determine the prevalence of this pathology during this period. Inclusion criteria: patients who met criteria for acute lithiasic cholecystitis; exclusion criteria: patients with data of choledocholithiasis and biliary pancreatitis. **Results:** 73 postoperative cholecystectomy patients with acute lithiasic cholecystitis were included, of which 79% (n = 58) were women and 21% (n = 15) men; the age group most affected was between 40-49 years old in 31% (n = 23). Seventy-five percent (n = 55) met Tokio grade II criteria, with duration of more than 72 hours being the criterion most present in 77% (n = 42), and 92% (n = 67) of the surgeries were performed laparoscopically. **Conclusions:** there was a slight increase in the prevalence of complicated cholecystitis with 8% of pyocholecystolithiasis, 7% hydrocholecystolithiasis and 3% gangrenous cholecystitis, which represents double the prevalence in other studies, and shows that it could have been affected by the closure of the consultation and elective surgery as a consequence of the pandemic.

RESUMEN

Introducción: *la colecistitis aguda es una inflamación de la vesícula, secundaria a obstrucción en la mayor parte de las ocasiones.* ***Objetivo:*** *determinar la prevalencia del aumento de colecistitis complicada.* ***Material y métodos:*** *se realizó un estudio descriptivo, transversal y observacional, se recabaron expedientes de 73 pacientes operados por colecistitis aguda durante enero de 2020 a febrero de 2021 para determinar la prevalencia de esta patología durante este periodo. Criterios de inclusión: pacientes que cumplieran criterios de cuadro agudo de colecistitis litiásica; criterios de exclusión: pacientes con datos de coledocolitiasis y pancreatitis biliar.* ***Resultados:*** *se incluyeron 73 pacientes postoperados de colecistectomía por colecistitis litiásica agudizada, de los cuales 79% (n = 58) fueron mujeres y 21% (n = 15) hombres, el grupo de edad mayormente afectado estuvo entre 40-49 años en 31% (n = 23). El 75% (n = 55) cumplieron con criterios de Tokio grado II, siendo la duración mayor de 72 horas el criterio más presente en 77% (n = 42) y 92% (n = 67) de las cirugías se realizaron vía laparoscópica.* ***Conclusiones:*** *se demostró un ligero aumento de la prevalencia de colecistitis complicada con 8% de piocolecistolitiasis, 7% hidrocolecistolitiasis y 3% colecistitis gangrenosa, lo que representa el doble de prevalencia en otros estudios, esto demuestra que pudo verse afectado por el cierre de la consulta y la cirugía electiva a consecuencia de la pandemia.*

* General Surgery Resident. General Hospital "Dr. Norberto Treviño Zapata".

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INTRODUCTION

Acute cholecystitis is an inflammation of the gallbladder, where biliary colic is the main symptom of cholelithiasis without inflammation of the gallbladder; the inflammation is secondary to obstruction of the gallbladder usually secondary to a litho at the level of the neck or cystic duct, obstructing the drainage of the gallbladder and causing an increase in

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intraluminal pressure, producing edema of the wall that can progress to ischemia, necrosis, and perforation.[1]

Diagnosis is based on clinical findings on physical examination, laboratory results and imaging criteria;[2] in 2008 the Tokyo guidelines were published and subsequently updated in 2013 and 2018, and their criteria include local signs of inflammation, systemic signs of inflammation, and imaging study findings, which help in the diagnosis and staging of the clinical picture according to the severity of the inflammatory process.

In the clinical picture is common the presence of pain in the right hypochondrium that can sometimes radiate to the ipsilateral scapula and positive Murphy's sign; and signs of systemic inflammation may include fever, tachycardia, elevated blood cell count, C-reactive protein (CRP), and other laboratory markers.

Ultrasound imaging is the initial study of choice when acute cholecystitis is suspected, due to its low cost, easy access, and short time required to perform it; computed tomography (CT) or magnetic resonance imaging (MRI) can be used to evaluate or exclude other pathologies that present with pain in the right hypochondrium.[3] Ultrasound is more sensitive for detecting gallbladder stones, CT is less sensitive because the composition of the stones may vary; thickening of the gallbladder wall is the most common finding during imaging studies, and distension of the gallbladder, pericholecystic fluid and sometimes a stone embedded in the neck or cystic duct can also be visualized.

Based on the Tokyo guidelines, a grade I cholecystitis can be considered as an uncomplicated condition, while a complicated cholecystitis would be a grade II or III,[4] giving a treatment algorithm according to the degree of severity, in which it is recommended that in patients with grade I, a laparoscopic cholecystectomy be performed, in grade II it is suggested that laparoscopic cholecystectomy be performed in highly experienced centers, and in grade III a cholecystostomy should be performed.

Laparoscopic cholecystectomy has been accepted as the treatment of choice for acute cholecystitis.[5] Traditionally acute cholecystitis was treated conservatively in its acute phase with a new hospital admission several weeks later for scheduled cholecystectomy.[6] It was thought that avoiding the acute inflammatory process could have a lower incidence of complications. Multiple studies have been carried out to determine the optimal time for cholecystectomy, and it is recommended that cholecystectomy be performed as soon as possible after diagnosis, unlike the Tokyo guidelines, which recommend that it should be performed only in grade I cases and in some selected grade II cases. Early cholecystectomy has been shown to decrease in-hospital sta. There is no increased risk of complications or procedure conversion, and it has been shown that there is a higher risk of bile duct injury in patients with delayed cholecystectomy.[7]

We speak of a difficult cholecystectomy when there is a conversion from laparoscopic to open surgery or when an iatrogenic injury occurs during surgery.[8] The incidence of procedure conversion is reported as 1.9-11.9%.[9] Several risk factors for a difficult cholecystectomy have been identified throughout clinical history, among which are: male sex, advanced age, chronic acute cholecystitis, obesity, liver cirrhosis, biliodigestive fistula, adhesions due to previous surgeries in the right upper quadrant, and others. Within the imaging studies, the factor with statistical association for conversion was the thickness of the gallbladder wall, being than 6 mm,[10] and during surgery the main reason for conversion is the poor visualization of the biliary anatomy and the difficulty to dissect the structures of Calot's triangle.

Complicated cholecystitis includes empyema and gangrenous cholecystitis, the latter occurring in 2 to 36% of patients with acute cholecystitis,[11] which increases the incidence of morbidity and mortality. Several scales have been used to try to predict complicated cholecystitis and difficult laparoscopic cholecystectomy. We previously mentioned the Tokyo scale, later the American Association of Trauma Surgeons (AATS) scale was developed, which includes among its criteria radiological findings, intraoperative findings, and the histopathological report[12] and it has been mentioned in studies that

the latter is more sensitive than the Tokyo scale which does not mention the extent of gallbladder inflammation, as it does not include intraoperative findings in its criteria,[13] so studies have shown that the way to classify the severity of inflammation for cholecystitis is better defined and classified during surgery than any imaging study.[14]

Medical treatment is considered in certain areas, prevents the risk of surgery, includes fasting, intravenous hydration, analgesics, and intravenous antibiotics, followed by delayed cholecystectomy.[15] Medical management can be effective in patients with grade I cholecystitis, but recurrence of the clinical picture has been demonstrated within two years after the initial clinical picture, and medical management may be considered in elderly patients or those with multiple comorbidities.

Open surgery was once considered the gold standard for acute cholecystitis, until a few years ago when it was demonstrated, that emergency gallbladder surgery had benefits such as: low incidence of surgical site infection and fewer days of hospital stay, but did not show great differences between the time of intervention, blood loss during surgery or incidence of biliary injury.[16] Studies have also been carried out to determine the optimal time for cholecystectomy and it has been determined that the ideal time is to operate within 72 hours after admission to the emergency room,[17] it has been shown that chronic inflammation causes fibrosis, adhesions, and distortion of the anatomy, making dissection difficult when performing laparoscopic cholecystectomy.[18] It has been seen that there is a lower rate of morbidity, complications, and conversion from laparoscopic to open surgery when an early cholecystectomy is performed compared to a late one.

Among them, subtotal cholecystectomy has been reported, which is performed when the structures of Calot's triangle are not clearly visualized due to a dense fibrosis.[19] When performed laparoscopically, it prevents injury to the biliary tract and significantly reduces the conversion of the procedure, and cases of recurrence of lithiasic disease are rare. Another option that has been described is cholecystostomy, which has been accepted as a less invasive procedure than cholecystectomy and temporary improvement, especially in critical patients; it has been used to decompress the gallbladder and improving the subsequent inflammation.[20] However, there are not established defined criteria to perform this procedure, but the main indication is in patients with grade III cholecystitis, according to the Tokyo scale.[21]

There are intraoperative scales that evaluate the degree of inflammation and anatomy, such as the Parkland and the World Society of Emergence Surgery (WSES) scales. They have a good correlation with technical difficulties during the procedure or conversion of the surgery.[22] The main complications following cholecystectomy are bile duct injury, biliary leakage, bile duct stenosis, biliomas, and presence of retained bile in the common bile duct.[23]

Gestational cholecystitis occurs in 1 to 6 per 10,000 pregnancies and represents the second most frequent cause of non-obstetric abdominal pain during pregnancy.[24] It has been recommended to perform laparoscopic cholecystectomy during the second trimester, since it has been shown that delaying the procedure may increase the risk of maternal-fetal complications.

During the COVID-19 pandemic, surgical services were forced to suspend all scheduled surgeries for the management of benign and low-risk pathologies,[25] so it is believed that most of acute cholecystitis cases that arrived to the emergency departments were at higher risk of complication or more severe enough to proceed to surgery.

MATERIAL AND METHODS

A descriptive, cross-sectional, and observational study was conducted, where records of 73 patients operated on for acute cholecystitis during the period from January 2020 to February 2021 were collected to determine the prevalence of this pathology.

Inclusion criteria were all patients who met the criteria for acute lithiasic cholecystitis. Exclusion criteria included patients with data of choledocholithiasis and biliary pancreatitis.

Descriptive statistics were performed, and values were expressed as mean and standard deviation. Qualitative variables were expressed as percentages.

RESULTS

The records of 73 patients undergoing cholecystectomy for acute calculous cholecystitis during the study period were included, where 79% (n = 58) were female and 21% (n = 15) were male. The patients were grouped by decade of life *(Figure 1)*.

To determine the severity of acute lithiasic cholecystitis, we classified them based on the Tokyo criteria; of the 73 patients who underwent surgery, 25% (n = 18) met grade I criteria (mild) and 75% (n = 55) presented at least one criterion for grade II (moderate) and there were no cases with grade III criteria (severe). Within the 75% (n = 55) of patients who had a moderate criteria picture, the presence of symptoms greater than 72 hours was the main parameter in 77% (n = 42), followed by local findings in 14% (n = 7) and leukocytosis in 9% (n = 5); none had a mass on palpation of the right upper quadrant.

During the surgical findings of the 73 patients, 81% (n = 59) had an uncomplicated acute condition and 19% (n = 14) had a complicated acute condition, 8% (n = 6) had pyocholecystolithiasis, 4% (n = 3) had gangrenous cholecystitis, and 7% (n = 5) had hydrocholecystolithiasis. Cholecystectomy was performed laparoscopically in 92% (n = 67), and in 8% (n = 6) it was used an open approach. In all of them, the procedure was successfully performed with complete removal of the gallbladder. Of the 14 patients who had complicated cholecystitis, 71% (n = 10) were female and 29% (n = 4) were male.

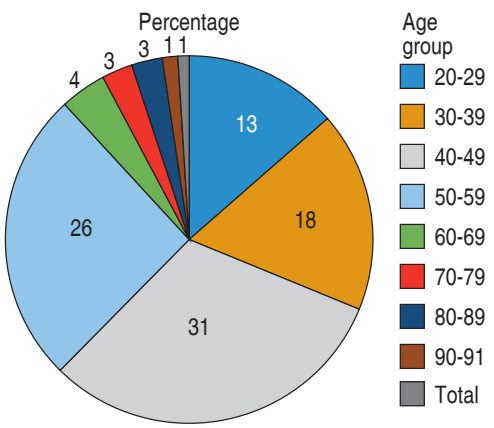

Figure 1: *Age group percentage presentation.*

DISCUSSION

As previously mentioned, in Mexico there is a lack of reliable information on the pathology of biliary lithiasis, its incidence and the different treatments.

Acute cholecystitis is the main complication of cholelithiasis and represents 20% of admissions to emergency centers. In our case, 100% of the patients had acute symptoms, of which 81% (n = 59) met the Tokyo criteria for mild symptoms, 19% (n = 14) for moderate symptoms and none for severe symptoms.

Based on a study performed at the Central Hospital of Chihuahua on emergency cholecystectomies performed in a period of one year, there were 22 hydrocholecystolithiasis cases representing 3.73%, 36 cases with pyocystocystolithiasis (7.18%) and one gangrenous cholecystitis. In our study, there were 3% of gangrenous cholecystitis, 7% hydrocholecystolithiasis, and 8% piocholecystolithiasis, which in general shows that there was an increase of almost the double of the percentage for hydrocholecystolithiasis and 1% in piocholecystolithiasis.

Overall, for patients undergoing elective cholecystectomy surgery, there is an incidence of conversion of 5%, increasing 5% in emergency surgery; in our study, no conversion procedures were done.

Of the 73 cholecystectomies, 8% (n = 6) were initially performed openly; this decision may have been influenced by a lack of material or by the attending physician decision based on the Tokyo criteria and the high risk of conversion.

It is shown that there was a slight increase in the prevalence of complicated cholecystitis influenced not only by the suspension of elective surgery, but also by the fear of going to hospital centers for evaluation due to the high incidence of COVID-19 cases, so it was

evidenced that the patients were on distress for more than 72 hours, which favored that they could present a complicated picture.

CONCLUSIONS

1. Acute cholecystitis represents the most frequent complication in patients with cholelithiasis and constitutes 20% of admissions to emergency departments. In our study, all patients who underwent surgery presented acute symptoms, some with more severe criteria than others.
2. There was a minimal increase in cases of complicated cholecystitis during the COVID-19 pandemic period with the subsequent suspension of elective surgeries.
3. There was an increase in the number of days of hospital stay in patients with complicated cholecystitis.
4. All laparoscopic cholecystectomies were successfully performed, so there was no incidence of conversion procedures from laparoscopic to open surgery.

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Correspondence:
Mauricio Muñoz-Muñoz
E-mail: mao_mumu@hotmail.com