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**Review Article**

# Acute cholangitis: a literature review

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## ABSTRACT

Acute cholangitis is a disease that occurs when a stricture or obstruction of the bile duct causes cholestasis and/or infection. Biliary stricture or obstruction elevates the pressure in the biliary system and causes reflux of microorganisms or endotoxins from the infected bile into the systemic circulation, which induces a systemic inflammatory response. The Charcot triad provides high specificity, however, due to its low sensitivity (50-70%), it is very limited to make a diagnosis of cholangitis alone. Therefore, the most current guidelines suggest specific criteria for diagnosis. Antibiotic treatment is a fundamental pillar in the management of patients with cholangitis. The treatment must be carried out depending on the severity (grade I-III).

**Keywords:** Cholangitis, Charcot, Biliary tract

## INTRODUCTION

Acute cholangitis is a disease that occurs when a stricture or obstruction of the bile duct causes cholestasis and/or infection. Biliary stricture or obstruction elevates the pressure in the biliary system and causes reflux of microorganisms or endotoxins from the infected bile into the systemic circulation, which induces a systemic inflammatory response.[1] Acute cholangitis in particular can cause rapid deterioration leading to sepsis, so early and appropriate treatment is required. It currently has a mortality rate of 2.7-10%. Three factors are necessary for its development: obstruction of bile flow, colonization of bile with bacteria, and elevated intraductal bile pressure.[1-3]

## CAUSES

### *Lithiasis*

It includes choledocholithiasis, cholecystitis, hepato-lithiasis, and mirizzi syndrome.

### *Malignant*

It includes bile duct, pancreatic, ampullary or duodenal tumours.

### *Stenosis*

It includes congenital, post-surgical, inflammatory or iatrogenic.

### *Various others*

Others include pancreatitis, parasitosis, duodenal diverticulosis or sinkhole syndrome.[2]

The classic clinical picture may be represented by the Charcot triad consisting of right hypochondrium pain, fever and jaundice. Although only 15% of patients present the complete triad and in older patients, the clinical manifestations can be varied, such as unspecific abdominal pain, fever, urinary inconitancy, and altered

alertness, among others. A correct examination is essential to rule out other etiologies.[3]

## DIAGNOSIS

The Charcot triad provides high specificity, however, due to its low sensitivity (50-70%), it is very limited to make a diagnosis of cholangitis alone. Therefore, the most current guidelines suggest the following criteria for diagnosis in Table 1.[4,5]

In Table 1, A-2: abnormal white blood cell count, increased CRP level, other changes indicating inflammation; and B-2: increase in FA, GGT, AST, and ALT.

Other useful factors in the diagnosis of acute cholangitis are abdominal pain (right hypochondrium or epigastrium) and history of biliary disease such as gallbladder stones, and previous biliary procedures such as stent placement.

**Table 1: TG18/TG13 diagnostic criteria for acute cholangitis.[5]**

| A. | Parameters |
|---|---|
| **A** | Systemic inflammation |
| A-1 | Fever or chills |
| A-2 | Laboratory: Evidence of high systemic response |
| **B** | Systemic inflammation |
| A-1 | Fever or chills |
| A-2 | Laboratory: evidence of high systemic response |
| **C** | Cholestasis |
| B-1 | Jaundice |
| B-2 | Laboratory: elevation of liver function |
| **D** | Image |
| C-1 | Biliary dilatation |
| C-2 | Evidence of aetiology by imaging (stenosis, lithosclerosis, stent) |

Diagnostic suspicion: one criterion from A + one criterion from B or C; definitive diagnosis: one criterion of A + one criterion of B + one criterion of C

**Table 2: Thresholds.**

| No. | Thresholds |
|---|---|
| **A-1** | Fever |
| | Temperature >30ºC |
| **A-2** | Evidence of systemic inflammatory response |
| | White blood cell count <4,000 or >10,000/dl |
| | CRP >1 mg/dl |
| **B-1** | Jaundice |
| | Total bilirubin >2 mg/dl |
| **B-2** | Abnormal liver function |
| | FA >1.5 STD[a] |
| | GGT >1 .5 STD[a] |
| | AST >1.5 STD[a] |
| | ALT >1.5 STD[a] |

a: STD: above the limit of the normal value

According to TG18/TG13, the diagnosis can be made if the following 3 pathologies are present: evidence of systemic infection, cholestasis and image-proven bile duct lesions.[5] Cholestasis is a key diagnostic feature. Jaundice is seen in only 60-70% of patients, but the diagnosis can be made in the absence of jaundice based on elevated liver function tests by laboratory. It is still impossible to make the diagnosis with imaging findings alone (ultrasonography (USG), computed tomography (CT), magnetic resonance cholangiopancreatography (MRCP)). Acute cholangitis should be differentiated from acute cholecystitis, liver abscess, gastric and duodenal ulcer, acute pancreatitis, acute hepatitis, and septicemia of other causes.[5,6]

### *Endoscopic retrograde cholangiopancreatography*

It is used for treatment (drainage), but is not used as a first choice for diagnostic purposes.[7]

### *CT scan*

Can identify bile duct dilatation and may contribute to better diagnosis of the cause of biliary stenosis (e.g., biliary carcinoma, pancreatic cancer, sclerosing cholangitis).[7]

### *MRCP*

This is a non-invasive method that can delineate the bile duct and is a good option to identify malignant pathology or bile duct stones causing biliary obstruction.[7]

**Table 2: Diagnostic and severity criteria.**

| Grade | Diagnostic and severity criteria |
|---|---|
| **Grade I (mild)** | No grade I or III criteria; associated with two or more of the following |
| **Grade II (moderate)** | White blood cells >12,000 or <4,000 |
| | High fever ≥39ºC |
| | Age ≥75 years |
| | Total bilirubin >5 mg/dl |
| | Hypoalbuminemia (<STDº×0.7) |
| **Grade III (severe)** | Associated with the onset of dysfunction of at least one of the following organs/systems |
| Cardiovascular dysfunction | Hypotension requiring dopamine ≥5 ug/kg/min or any dose of norepinephrine |
| Neurological dysfunction | Loss or alteration of consciousness |
| Respiratory dysfunction | Pao2/FiO2 <300 |
| Renal dysfunction | Oliguria/serum creatinine >2 mg/dl |
| Liver dysfunction | TP-INR >1.5 |
| Hematologic dysfunction | Platelets <100,000/mm$^3$ |

**Table 3: Most frequently isolated organisms.[5]**

| Organism | Percentage |
|---|---|
| **Gram-negative** | |
| *E. coli* | 31-44 |
| *Klebsiella* | 9-20 |
| *Pseudomonas* | 0.5-19 |
| **Gramm-positives** | |
| *Enterococcus* | 3-34 |
| *Streptococcus* | 2-10 |
| *Anaerobes* | 4-20 |

Antibiotic management will depend on the classification of the patient and the sensitivity of the pathogen isolated once a result is available.[9,10]

Once the bile duct is drained, treatment should be continued for 4-7 days if it is community-acquired cholangitis. In the case of healthcare-associated cholangitis, treatment should be extended for at least 2 weeks if gram-positive bacteria are isolated.[11,12]

## SURGICAL TREATMENT

In severe cases or as prevention of greater severity, decompression of the bile duct by drainage is necessary. Even so, the mortality rate can be 10% despite responses to antibiotic treatment and biliary drainage.[11]

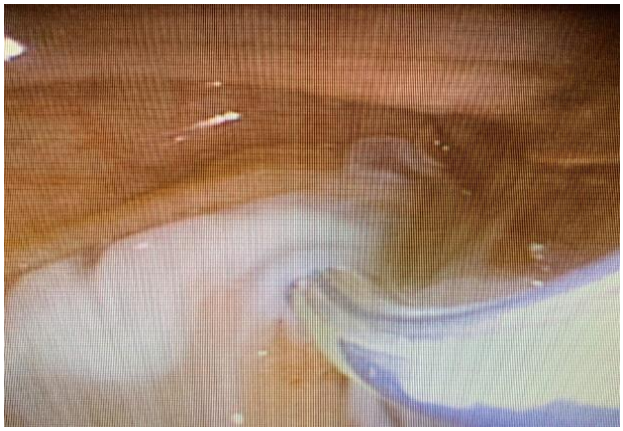

**Figure 1: Pus in the biliary tract.**

## DISCUSSION

The treatment must be carried out depending on the severity, the authors of different international organizations agree that it must be established as follows.

***Grade I (mild)***

Management will be with antibiotic therapy. Bile duct drainage may be necessary for those who do not respond to initial medical management. Endoscopic, percutaneous or surgical intervention depending on the etiology may be performed after initial management.[2,4,5,7,11]

***Grade II (moderate)***

In addition to the initial medical management, endoscopic, percutaneous or surgical drainage should be performed by placing a T-tube. Once the patient's condition improves, a definitive procedure will be performed depending on the cause.[2,4,5,7,11]

***Grade III (severe)***

These patients will require life support such as invasive or non-invasive ventilation, use of vasopressors and urgent biliary drainage should be anticipated. Once medical management, life support, endoscopic or urgent percutaneous transhepatic endoscopic or percutaneous biliary drainage has been performed, bile duct decompression by T-tube placement can be performed urgently. Once the acute disease has resolved, the cause of the acute cholangitis should be corrected.[2,4,5,7,11]

## CONCLUSION

Cholangitis is a true emergency, its timely diagnosis is essential to establish an optimal treatment, as well as to reduce the associated morbidity and mortality.

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