

**THE ROLE AND PRINCIPLES OF ANTIBIOTIC THERAPY IN ACUTE  
CHOLECYSTITIS**

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**Abstract:** Acute cholecystitis is a common surgical condition characterized by inflammation of the gallbladder, most often caused by gallstone obstruction of the cystic duct. Bacterial infection plays a significant role, particularly in moderate to severe cases, making antibiotic therapy a cornerstone of management. This article reviews the importance, indications, selection principles, and duration of antibiotic therapy in acute cholecystitis based on current clinical guidelines and evidence-based practice.

**Keywords:** Acute cholecystitis, antibiotic therapy, biliary infection, gallstones, surgical infection.

**Introduction.** Acute cholecystitis is an acute inflammatory disease of the gallbladder that frequently requires hospitalization and surgical intervention. Although gallstone obstruction is the primary initiating factor, secondary bacterial infection contributes significantly to disease progression and complications. Timely and appropriate antibiotic therapy reduces infectious complications, systemic inflammation, and mortality, especially in severe forms of the disease.

#### Pathophysiology and Microbiology

Obstruction of the cystic duct leads to bile stasis, gallbladder distension, ischemia, and inflammation. Bacterial translocation from the intestine or biliary tract results in infection. The most commonly isolated pathogens include Gram-negative enteric bacteria such as *Escherichia coli*, *Klebsiella* species, and *Enterobacter* species, as well as Gram-positive organisms like *Enterococcus* species. Anaerobic bacteria may be involved in severe or gangrenous cases.

#### Importance of Antibiotic Therapy

Antibiotic therapy in acute cholecystitis serves to control local infection, prevent bacteremia and sepsis, and reduce postoperative infectious complications. While mild cases may resolve with early cholecystectomy alone, moderate and severe cases require prompt antimicrobial treatment as part of comprehensive management.

#### Indications for Antibiotic Therapy

Antibiotics are indicated in all patients with suspected or confirmed acute cholecystitis who exhibit systemic signs of infection, including fever, leukocytosis, or elevated inflammatory markers. According to severity grading systems, moderate (Grade II) and severe (Grade III) acute cholecystitis require immediate intravenous antibiotic therapy.

#### Principles of Antibiotic Selection

Antibiotic selection should be empirical initially, targeting the most likely biliary pathogens. The choice depends on disease severity, local antimicrobial resistance patterns, patient comorbidities, and prior antibiotic exposure. Commonly recommended regimens include third-generation cephalosporins, beta-lactam/beta-lactamase inhibitor combinations, or carbapenems in severe cases. Coverage for anaerobes is considered in complicated or advanced disease.

#### Route and Duration of Therapy

Intravenous antibiotics are preferred in the acute phase, particularly in moderate to severe cases. Therapy may be de-escalated or switched to oral agents once clinical improvement is achieved. The recommended duration is generally 4–7 days, with shorter courses possible after early source control such as cholecystectomy or gallbladder drainage.

#### Antibiotic Therapy and Surgical Management

Antibiotics complement but do not replace definitive source control. Early laparoscopic cholecystectomy is the treatment of choice in most patients. In high-risk or critically ill patients, percutaneous cholecystostomy combined with antibiotic therapy may be used as a bridging or definitive treatment.

#### Conclusion

Antibiotic therapy plays a vital role in the management of acute cholecystitis, particularly in moderate and severe cases. Appropriate selection, timely initiation, and optimal duration of antimicrobial treatment, combined with effective source control, significantly improve patient outcomes. Adherence to clinical guidelines and antimicrobial stewardship principles is essential to reduce complications and antibiotic resistance.

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