

## **Antibacterial therapy of acute biliary tract infections**

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**Annotation:** *this article is devoted to antibacterial therapy of acute biliary tract infections.*

**Key words:** biliary outflow, reinfection, intravesical pressure, vicious circle, ciprofloxacin.

Antibacterial therapy is aimed at preventing reinfection at the site of infection that continues after surgery and, thus, at preventing recurrent intra-abdominal infection.

The leading cause of the inflammatory process in the gallbladder is the presence of stones in it (which is called cholelithiasis). In 10% of cases, the development of cholecystitis is not associated with stones, and the causes may be helminths that have penetrated the gallbladder, enzymatic disorders due to dietary errors, and vascular disorders.

Due to a violation of the biliary outflow against the background of blockage of the ducts with stones, an increase in intravesical pressure is observed, which triggers the development of acute inflammation and can lead to necrosis of the organ wall. Against the background of insufficient blood supply, the mucous membrane of the organ loses its full protective function, so conditions are created for infection.

Both aerobic and anaerobic bacteria (*Escherichia coli*, *Klebsiella*, entero- and streptococci, *Pseudomonas aeruginosa*) can act as pathogens. The associated infectious inflammation further increases the intravesical pressure (due to fluid sweating through the dilated vessels). This starts a “vicious circle” that cannot break on its own without medical help. If treatment is delayed, the risks of complications increase, which may include: empyema of the bladder, when purulent contents accumulate inside it;

- perforation of the gallbladder wall with the development of peritonitis;
- formation of subhepatic and subphrenic abscess;
- development of multiple organ failure and sepsis.

As a rule, the causative agents of cholangitis are microorganisms of the intestinal microflora (Fig. 1), in most cases found in associations, as determined by the results of culture of bile taken from patients. These include:

- representatives of the Enterobacteriaceae family, among which *E. coli* plays a dominant role (50-60%), *Klebsiella* spp. are found with less frequency. (8-20%), *Serratia* spp., *Proteus* spp., *Enterobacter* spp., *Acinetobacter* spp. (2-5%),
- gram-positive microorganisms (*Streptococcus*, *Enterococcus*, detected, according to various authors, in 2-30%), • non-spore-forming anaerobes (*Bacteroides* spp.), *Clostridium* spp., fusobacteria, peptococcus (up to 20% of cases),
- *Pseudomonas* spp. (2-4%). Bacterial cholangitis tends to ascend, spreading to the intrahepatic ducts. With prolonged and severe purulent cholangitis, the development of complications is observed - empyema of the gallbladder, pylephlebitis, liver abscesses, septicemia. In abscess forms, anaerobic microorganisms predominate among the pathogens.

The unification of diagnostic criteria has made it possible to get an idea of the prevalence of sepsis in certain regions of the world. Sepsis is the main cause of death in non-coronary intensive care units and ranks 11th among all causes of mortality in the population. Data on the prevalence of sepsis in different countries vary significantly: in the USA - 300 cases/100,000 population, in France - 95 cases/100,000 population, in Australia and New Zealand - 77/100,000 population.

- Without manifestations of sepsis (7–10 days):
  - ampicillin + sulbactam – 1.5 g × 4 times a day IV, IM;
  - amoxicillin + clavulanic acid – 1.2 g × 3-4 times per day i.v.;
  - cefuroxime - 1.5 g × 3 times a day IV, IM;
  - ceftazidime - 1–2 g × 2 times a day IV, IM;
  - cefoperazone - 1–2 g × 2 times a day IV, IM;
  - ciprofloxacin – 400 mg × 2 times a day i.v.
- Infections complicated by sepsis: – monotherapy (7–10 days): ◊ ticarcillin + clavulanic acid — 3.1 g × 4–6 times a day intravenously; ◊ imipenem - 0.5 g × 4 times a day intravenously; ◊ cefepime - 2 g × 2 times a day IV, IM; – for prophylactic purposes in case of recurrent cholangitis (up to 2–4 months): ◊ co-trimoxazole - 960 mg × 2 times a day, orally, ◊ ciprofloxacin - 500 mg × 2 times a day, orally; – combination of drugs: ◊ ceftazidime - 2 g × 2 times a day IV, IM + metronidazole - 500 mg × 2 times a day IV; ◊ ciprofloxacin - 400 mg × 2 times a day IV + metronidazole - 500 mg × 2 times a day IV; ◊ amoxicillin + clavulanic acid - 1.2 g × 4 times a day IV + ciprofloxacin - 400 mg × 2 times a day IV.

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