



Surgical Infection Society guidelines on antibiotic use in gallstone surgery: high time we crack down on prophylactic antibiotics

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There is a great need for a more stringent and uniform use of antibiotic prophylaxis in general surgery. The decision to prescribe antibiotics is often made based on local routines or poorly defined reasons for prophylaxis, with no evidence base or concern about increasing microbial drug resistance. Drug resistance is now a major health concern and requires coordinated action at the global level to prevent further aggravation. Blind routine prophylaxis causes spread of resistant microbial strains that leads to situations where we no longer have effective antibiotics in cases of life-threatening infection. Nationwide standard routines for antibiotic use in day-to-day clinical practice such as gallstone surgery are essential, as local overuse leads to resistance hotspots that promote the spread of resistant microbes to areas where strict routines are followed (1).

Strict compliance to nationwide guidelines on antibiotic prescription is not only a matter of preventing global drug resistance but is also best for the patient. Naturally there are those who benefit greatly from antibiotic prophylaxis to prevent serious infectious complications, but there is always the risk of an adverse or allergic reaction to the antibiotic. Inappropriate use of antibiotics can cause gastrointestinal side-effects such as *Clostridium enteritis*, and although the risk is limited after a short course of antibiotic prophylaxis, this could cause great discomfort for the patient.

The United States Surgical Infection Society (SIS) has recently presented evidence-based guidelines for

appropriate antibiotic use in patients undergoing cholecystectomy (2). These guidelines are based on randomised controlled trials and, to some extent, large cohort studies. Even so, the SIS concludes that there is a need for better evidence, and in the absence of well-designed studies, some of the recommendations are based on consensus agreement.

The most common gallstone procedure in the Western is laparoscopic cholecystectomy for uncomplicated gallstone disease. Laparoscopic cholecystectomy for gallstone disease without secondary complication is a clean-contaminated procedure with little risk for surgical site infection. Numerous randomised controlled trials have also confirmed the lack of benefit from antibiotic prophylaxis in non-complicated gallstone disease. There is no doubt that routine use of antibiotic prophylaxis in such situations is bad clinical practice (2). Even so, the unnecessary use of antibiotics remains a worldwide problem (3,4).

Acute cholecystitis is often regarded as an infectious disease, though bacterial contamination of the bile is detected in only a minority of cases (5). In the absence of sufficiently powered randomised controlled trials assessing the benefit of antibiotic prophylaxis, most guidelines recommend treatment with antibiotics on admission for acute cholecystitis (2). However, since that literature review was conducted, two randomised controlled trials have been published. A study from South Korean could not

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demonstrate any benefit from antibiotic prophylaxis (6), whereas a slightly larger Dutch study showed a lower risk for surgical site infection if piperacillin was given as single dose (7). The recommendations remain the same, but the level of evidence has increased.

The SIS guidelines recommend not administering postoperative antibiotics to patients undergoing laparoscopic cholecystectomy for uncomplicated gallstone disease or mild to moderate cholecystitis according to the Tokyo guidelines criteria (8). Although there is a lack of large randomised controlled trials on postoperative antibiotic prophylaxis in uncomplicated gallstone surgery, and the trials conducted on acute cholecystitis have had limited power, this recommendation is logical as source control is achieved once cholecystectomy is completed and bile leakage has been ruled out. However, patients with severe acute cholecystitis (Tokyo Grade 3), i.e., those with secondary organ failure, are recommended postoperative antibiotics up to 4 days after surgery (2). This recommendation is based on a large multicentre trial on patients with complicated intra-abdominal infection where the primary source of infection was under control (9). By definition, Grade 3 cholecystitis encompasses more than local disease, and it is logical that postoperative antibiotic treatment is warranted in this group.

There are also specific situations where well-designed studies are lacking. The risk for infectious complications is increased when laparoscopic cholecystectomy is converted to an open procedure, or when endoscopic retrograde cholangiopancreatography (ERCP) is performed at the same time as cholecystectomy, or when cholecystectomy is carried out with a cholecystostomy tube in place. However, even these situations do not necessarily ensure benefit from antibiotic prophylaxis and the pros and cons must be weighed in each case, but more than one dose of antibiotic is rarely necessary (2).

Great efforts are needed to ensure that these guidelines are implemented in routine clinical practice, and continual updates must also be followed up. These guidelines are based on the best evidence available today, but more research is needed to assess the benefits of antibiotic prophylaxis in cases of gallstone disease with secondary complications such as acute cholecystitis, biliary pancreatitis, obstructive jaundice, and gallbladder perforation. Until the results of new trials become available, the present SIS guidelines are the best available to date. As such, they may serve as a basis for antimicrobial stewardship and source of education for medical staff on

the appropriate use of antibiotics.

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