

Infection

Editorial: Antibacterial Therapy and Prophylaxis in Transurethral Surgery

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Prophylaxis may be defined as the deployment of antibacterial agents in advance of transurethral surgery for defense against anticipated infection. For patients with preoperative urinary tract infection (UTI), antibacterial agents are primarily used for therapy not prophylaxis, although they are administered in this situation for both purposes; i.e., as therapy for the existing UTI and for the prevention of bacteremia.

While there is consensus in the medical community that the patient with evidence of preoperative UTI should be treated before surgery, the use of antibacterial agents for pure prophylaxis – i.e., when there is no preoperative evidence of infection in the urinary tract – has long been controversial [5]. For many years, only the therapeutic use of antibacterial agents was accepted, and prophylaxis was considered useless or even harmful to the patient. This concept has changed dramatically. During recent years increasing emphasis has been placed on the preoperative use of antibacterial agents to prevent infectious complications following surgery.

The risks and cost of antibacterial prophylaxis must be weighed against complications that can be prevented. In transurethral surgery, the infectious complications of UTI infrequently cause bacteremia and sepsis. When bacteremia and sepsis do arise, they do not always result in morbidity or death. The need for antibacterial prophylaxis in transurethral surgery is therefore difficult to assess.

The classic experiments of Miles et al. [8] and Burke [3] provided the scientific rationale for preoperative use of antibacterial agents. Guinea pig dermal infections were studied in these experiments; maximum suppression of infection occurred when antibiotics were present in the tissue before bacteria gained access. While the results of these studies have been confirmed only in a study of the use of antibacterial agents in clinical gastrointestinal surgery [11], the situation is similar in urological surgery. In fact, the basic observation that antibiotics are effective in a short, decisive period has been extended to surgery in all areas of the body. Our studies with antibiotics in urinary tract surgery for kid-

ney, bladder, prostatic and epidymal infections in rats [10] have confirmed that antibiotics should ideally be administered preoperatively, but they have also showed that antibiotics effectively prevent UTI when administered as long as 6 h after surgery.

Bacteria that cause UTI in connection with transurethral section arise from several sources. In the study by Walker et al. that appears in this issue of *Urological Research* bacteria were found in the anterior urethra of more than half of the patients with negative preoperative urine culture. These bacteria gave rise to postoperative UTI. Such bacteria are likely to be the most important source of infection, although bacteria in the prostate and in bladder tumors have also been reported in many cases in which there was no evidence of preoperative UTI [1, 9]. Another source of infection is postoperative migration of bacteria along the indwelling catheter [2]. Bacteria originate from the perineum and migrate around the catheter to the bladder. This situation develops in patients within 96 h if an open-drainage system is used; the rate of infection can be reduced to about 20% during this time if closed drainage is used [7]. These observations support the routine administration of antibacterial agents in cases where the preoperative urine culture is sterile.

There is general agreement that antimicrobial agents should be used prophylactically in patients with cardiac valvular disease, in patients with any prosthetic device, and in patients who are immunosuppressed. Although it is unlikely that the efficacy of prophylaxis in these patients will be proven in clinical studies, infectious complications under these circumstances are so disastrous that prophylactic antibacterial agents should always be administered.

There is general agreement that a broad-spectrum antibacterial agent should be used in prophylaxis and therapy in connection with transurethral surgery. The most popular drugs are the cephalosporin antibiotics, especially the later generations. A single preoperative dose or short perioperative administration of a long-acting cephalosporin has been shown to be as effective in prophylaxis as two or more days

of administration [4, 6]. Longer antibacterial prophylaxis is not indicated since resistant strains of bacteria may develop. In the case of patients with cardiac valvular disease, patients with prostheses, or patients who are immunosuppressed, the drug of choice is a penicillin, possibly in combination with an aminoglycoside, since complications from infections with enterococci must be avoided.

In conclusion, antibacterial therapy is definitely indicated before transurethral surgery in patients with UTI and also in patients with cardiac valvular disease, with prostheses, or who are immunosuppressed. Where there is no evidence of preoperative infection, antibacterial prophylaxis is probably indicated. One preoperative dose of a long-acting antibiotic or a short perioperative regimen represents the state-of-the-art.

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