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ORIGINAL ARTICLE

Antimicrobial prophylaxis to prevent perioperative infection in urological surgery: a multicenter study

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Abstract We prospectively investigated the rates of incidence of surgical site infection (SSI), urinary tract infection (UTI), and remote infection (RI) in 4,677 patients who underwent urological surgery from January to December 2010, including 2,507 endourological cases, 1,276 clean cases, 807 clean-contaminated cases, and 87 contaminated cases involving bowel segments. A single dose of antimicrobial prophylaxis (AMP) was administered in the endourological, clean, and clean-contaminated surgery cases, except for patients who underwent transurethral resection of the prostate (TURP) or percutaneous nephrolithotripsy (PNL). AMP was administered within 72 h in TURP and PNL, and AMP was administered within 48 h in contaminated surgery cases. In cases of endourological surgery, UTI was observed in 4 % and RI in 0 %, and SSI, UTI, and RI were seen in 1 %, 1 %, and 1 %, respectively, of clean surgery cases, in 3 %, 3 %, and 2 %, respectively, of clean-contaminated surgery cases, and in 17 %, 30 %, and 10 %, respectively, of contaminated surgery cases. In multivariate analysis of the risk factors for infection, operative time was a significant risk factor for UTI in endourological surgery, and American Society of Anesthesiologists score and operative time were significant risk factors for RI in clean surgery. No significant risk factor was found in analyses of clean-contaminated and contaminated surgery cases. A single-dose AMP regimen was shown to be effective and feasible for prevention of perioperative infection in urological surgery.

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Introduction

Drug-resistant bacteria are increasing, and thus selection of antimicrobial prophylaxis (AMP) and its duration are important issues for avoiding antimicrobial resistance possibly induced by unnecessary use of antibiotics. In 2006, the "Japanese guidelines for prevention of perioperative infections in the urological field" [1] were published by the Japanese Urological Association (JUA). However, when compared with those published in Europe [2] and the United States [3], slightly longer periods of administration are recommended in Japan. For example, in guidelines of the American Urological Association (AUA) and European Urological Association (EAU), administration of AMP is not necessary in low-risk patients undergoing clean surgery, although it is given as a single dose or throughout 24 h in clean-contaminated and contaminated surgery cases. In the JUA guidelines, AMP is required within 24 h in clean surgery, within 48–72 h in clean-contaminated surgery, and within 72–96 h in contaminated surgery involving bowel segments. Therefore, it is important to verify the true incidence of perioperative infections, not only to harmonize the Japanese guidelines with those in Europe and the United States, but also to assess the feasibility of a single-dose AMP regimen in urological surgery cases. We prospectively investigated the rates of incidence of perioperative infections, including surgical site infection (SSI), urinary tract infection (UTI), and remote infection (RI), in patients with low to intermediate risk (ASA score 1–3) in a multicenter study.

Patients and methods

A total of 5,057 cases of urological surgery were performed at the 21 participating hospitals from January to December 2010. Because 380 cases with unknown American Society of Anesthesiologists (ASA) score or surgical procedure were excluded, thus 4,677 patients with low to intermediate risk (ASA score 1–3), including 2,507 endourological, 1,276 clean, 807 clean-contaminated, and 87 contaminated surgery cases, were prospectively analyzed. Cases with UTI or severe infections in other sites that may affect the outcome of SSI, RI, or UTI following surgery were excluded. The protocol of the present study was approved by the ethics committee belonging to each participating hospital or that of the Hyogo College of Medicine.

The categories of surgical procedures were defined as reported previously [4] (Table 1).

Partial nephrectomy and transvaginal surgery were classified as clean surgery because the SSI rate was as low as other clean surgery such as nephrectomy and adrenalectomy, as shown in our previous paper [4]. In each category, antibiotics were selected according to our protocol (Table 2). In clean surgery, no administration of AMP was allowed in accordance with the EAU and AUA guidelines [2, 3].

Single-dose AMP was administered in cases of endourological, clean, and clean-contaminated surgery, except

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