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JOURNAL-BASED CME ARTICLE

Short Versus Long Course of Antibiotics for Catheter-Associated Urinary Tract Infections in Patients With Spinal Cord Injury: A Randomized Controlled Noninferiority Trial

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Statement of Need:
Urinary tract infection (UTI) is the most common hospital acquired infection in patients with spinal cord injury (SCI). In general, catheter-associated urinary tract infection (CA-UTI) can lead to serious medical complications, prolong hospitalization, and incur tremendous cost. More than 90% of cases of bacteriuria in patients with SCI who use an indwelling bladder catheter are asymptomatic. The management of CA-UTI has not been standardized in patients with SCI with respect to (1) the need to immediately replace the indwelling catheter, (2) the necessity to provide antibiotic coverage against all organisms grown from urine cultures, and (3) the duration of antibiotic treatment. This activity provides information on the role of catheter discontinuation and the higher rates of clinical improvement and lower rates of symptomatic relapse.

This journal-based activity has been planned and developed in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the sponsorship of Professional Education Services Group (PESG).

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Educational Objectives:
To support the attainment of knowledge, competence, and performance, the learner should be able to achieve the following objectives:

1. To assess the applicability of a short-course regimen of antibiotics for managing catheter-associated urinary tract infection (CA-UTI) in patients with spinal cord injury (SCI).
2. Identify causative agents for infections and appropriate treatment options.
3. Evaluate options for catheter exchange in patients with spinal cord injury (SCI).

Planning Committee
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This continuing education activity is active starting February 1, 2014 and will expire January 31, 2015.

Estimated time to complete this activity − 1.0 hours

Abstract

Objective: To assess the applicability of a short-course regimen of antibiotics for managing catheter-associated urinary tract infection (CA-UTI) in patients with spinal cord injury (SCI).

Design: Randomized, controlled, noninferiority trial.

Setting: Medical center.

Participants: Patients with SCI who had CA-UTI (N=61).

Interventions: Patients were randomized to receive either a 5-day regimen of antibiotics after catheter exchange (experimental group) or a 10-day regimen of antibiotics with catheter retention (control group). Noninferiority was prespecified with a margin of 10%.

Main Outcome Measure: Clinical cure at the end of therapy.

Results: Of the 61 patients enrolled in this study, 6 patients were excluded because of bacteremia or absence of urinary symptoms. All patients (100%) achieved clinical cure at the end of therapy. The rates of microbiologic response were 82.1% in the experimental group and 88.9% in the control group (upper boundary 95% confidence interval (CI) for difference, 26%). The rates of resolution of pyuria were 89.3% in the experimental group and 88.9% in the control group (upper boundary 95% CI for difference, 16%). Patients in the experimental group had higher rates of CA-UTI recurrence than the control group. The rates of new CA-UTI, diarrhea, and *Clostridium difficile* colitis were similar in the 2 treatment arms.

Conclusions: The primary endpoint of the study was met, indicating that the 5-day regimen with catheter exchange was noninferior to the 10-day regimen with catheter retention on the basis of clinical cure. Criteria for noninferiority on the basis of microbiologic response and resolution of pyuria were not met.

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Urinary tract infection (UTI) is the most common hospital-acquired infection in patients with spinal cord injury (SCI).[1] In general, catheter-associated urinary tract infection (CA-UTI) can lead to serious medical complications, prolong hospitalization, and incur tremendous cost.[2-4] More than 90% of cases of bacteriuria in patients with SCI who use an indwelling bladder catheter are asymptomatic.[5] The rates of CA-UTI differ according to study's definition of UTI and the type of urinary catheters.[6,7] In 1 observational study, the incidence rate of CA-UTI and catheter-associated asymptomatic bacteriuria was 2.7 and 5 cases per 100 person-days, respectively.[8]

The management of CA-UTI has not been standardized in patients with SCI with respect to (1) the need to immediately replace the indwelling catheter, (2) the necessity to provide antibiotic coverage against all organisms grown from urine cultures, and (3) the duration of antibiotic treatment. The Infectious Disease Society of America has published guidelines for the diagnosis and management of CA-UTI.[6] These guidelines recommend early urinary catheter discontinuation and 7- to 14-day antibiotic regimen to treat UTIs in patients with chronic indwelling bladder catheters.

The role of catheter discontinuation was evaluated in 1 randomized controlled trial.[9] Twenty-seven catheterized nursing home patients were randomized to either catheter replacement or no replacement. Patients who underwent catheter replacement had higher rates of clinical improvement and lower rates of symptomatic relapse. However, the need to remove the urinary catheter was not specifically examined in patients with SCI.

Other studies have evaluated the duration of antibiotic therapy for CA-UTI. These studies have shown conflicting results as to whether a shorter antibiotic regimen was as effective as a longer one. In 1 study,[10] 32 catheterized patients with lower urinary tract symptoms were randomized to receive a single dose of trimethoprim-sulfamethoxazole versus a 10-day therapy. One single dose was as effective as a 10-day regimen in the resolution of symptoms, especially in women <65 years. Another study compared a 3-day course with a 10-day course of antimicrobials for treatment of CA-UTI in 46 intermittently catheterized patients with a neurogenic bladder.[4] Both groups had similar rates of cure, microbiologic persistence, and relapse. A third randomized controlled trial compared a 3-day course with a 14-day course of ciprofloxacin in SCI patients with CA-UTI and demonstrated similar clinical response between the 2 groups.[11] Although patients who received a 14-day regimen had higher rates of microbiologic response and lower rates of clinical and microbiologic recurrence than those who received a 3-day regimen, the results of the study raised the possibility that a 2-week antibiotic regimen may not be necessary, and a shorter antibiotic regimen that exceeds 3 days could be sufficient. In a fourth trial, intermittently catheterized patients with a neurogenic bladder and UTI were randomized to a 5-day course of levofloxacin or a 10-day course of ciprofloxacin.[12] Microbiologic response among catheterized patients was higher in the levofloxacin group (5d) than the

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