

Evidence-Based Protocol

Diagnosis and Treatment of Catheter-Associated Urinary Tract Infection Within Adult Neurocritical Care Patient Population

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KEYWORDS

- Neurologic ICU • Urinary tract infection • Nosocomial infections
- Immunodepression syndrome

KEY POINTS

- Evidence exists that patients requiring neurologic ICU (NCU) admission have concomitant immunosuppression that makes them more prone to acquiring nosocomial infections.
- The risk of infection is highest in the acute phase after stroke, which may be attributed to stroke-induced immunodepression syndrome.
- Significant numbers of patients are being diagnosed inappropriately with catheter-associated (CA) urinary tract infection (UTI), for which they receive treatment that is not recommended.
- Protocol-based care enables providers to translate evidence into practice.

INTRODUCTION

It has been reported that admission to an NCU after stroke reduces mortality through prevention and treatment of complications, especially infection.¹ The overall clinical course of NCU patients is greatly affected, however, by the occurrence of medical complications during the course of the disease, which have a substantial impact on both mortality and long-term clinical outcome. Evidence exists that patients requiring NCU admission have concomitant immunosuppression that make them more prone to acquiring nosocomial infections.² The risk of infection is highest in the acute phase after stroke, which may be attributed to stroke-induced immunodepression syndrome.³

BACKGROUND AND SIGNIFICANCE

Recent evidence suggests that NCUs, amid all ICUs, possess a high incidence of hospital-acquired UTIs.^{4,5} Therefore, strong emphasis has been recently placed on

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health care providers decreasing complications and improving quality across the spectrum of patient care. Beginning in October 2008, the Centers for Medicare and Medicaid Services (CMS) stopped offering additional reimbursements for patients discharged with a diagnosis of CA-UTI.⁶ Among the 10 hospital-acquired conditions selected by the CMS, CA-UTI received a high priority due to its high cost and high volume.⁷

In addition, a majority of cases of nosocomial CA-UTI are really CA asymptomatic bacteriuria (CA-ASB).⁸ According to the 2005 Infectious Diseases Society of America (IDSA) guidelines, CA-ASB is not a clinically significant condition, and treatment is unlikely to confer clinical benefit.⁹ A significant limitation between evidence-based guidelines concerning management of CA-ASB and clinical practice has been documented, however, in recent publications from the United States, the United Kingdom, France, and Canada.^{10–14} Significant numbers of patients are being diagnosed inappropriately with CA-UTI, for which they receive treatment that is not recommended. This inappropriate treatment is potentially harmful in terms of emergence of resistant pathogens, superinfections, and unnecessary costs.

PURPOSE AND SPECIFIC AIMS

Despite published guidelines for the diagnosis and optimal selection of an antimicrobial agent and duration of therapy in treating CA-UTI, NCU providers in Vanderbilt University Medical Center (VUMC) demonstrate a wide variation in its treatment practices. This may be associated with undesirable outcomes, including subsequent antimicrobial resistance, adverse drug effects, and cost. In phase 1, the purpose of this project was a quality-improvement (QI) initiative that (1) examined the prescribing practices for the treatment of CA-UTI within an NCU adult patient population, (2) determined whether these practices followed the recommendations in the IDSA guidelines, and (3) developed an evidence-based protocol for diagnosis and treatment of CA-UTI in an adult neurocritical care patient population that includes recommendations of the IDSA guidelines and the development of an NCU antibiogram. The aim of this protocol was not intended, however, to replace clinical judgment but to provide an organized method for diagnosing and treating CA-UTI within the adult neurocritical care patient population.

PRACTICE SETTING

The NCU at VUMC is a multidisciplinary 22-bed unit; 38% of the NCU patients are between the ages of 19 and 50. A majority of the patients are in the neurosurgery (56%) and neurology (29%) services. The most common 3 admitting diagnoses in the NCU are stroke (30%), seizures (15%), and brain tumors (11%). Generally, 62% of patients in NCU have a Foley catheter at some point during their admission. This NCU functions with close collaboration between multiple services; therefore, a successful protocol development within the NCU requires collaboration and commitment of all disciplines involved in providing NCU patients' care.

BENEFIT TO PRACTICE

Protocol-based care enables providers to translate evidence into practice. Protocols outline the optimal care for a specific group of patients to assist providers in making decisions regarding appropriate health care for a specific clinical situation. High-quality protocols are clear, reliable, and reproducible. Thus, they standardize practice and reduce variation in the treatment of patients, increase provider knowledge, and

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