

The Role of the Nurse Practitioner and Asymptomatic Urinary Treatments

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ABSTRACT

Asymptomatic urinary tract infections (aUTIs) are common among older adults in long-term care facilities (LTCFs) and studies have shown that they are inappropriately treated with antibiotics. We retrospectively characterized treatment strategies among 89 cases of aUTIs before and after a long-term facility hired a full-time nurse practitioner (NP). We found that residents with aUTIs were prescribed significantly more supportive treatment strategies after hiring an NP. However, there was no significant drop in the rate of inappropriate antibiotic treatments for aUTIs after hiring an NP.

Keywords: asymptomatic urinary tract infections, evidence-based care, long-term care facility

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INTRODUCTION

Urinary tract infections (UTIs) are a common acute infection among older adults in long-term care facilities (LTCFs),¹ and studies have shown that a large proportion of these UTIs are being inappropriately treated with antibiotics.²⁻⁶ There are 2 types of UTIs: symptomatic UTIs (sUTIs) and asymptomatic UTIs (aUTIs). A symptomatic UTI is diagnosed when bacteria in the urine (bacturia) is $\geq 10^5$ colony-forming units (CFU) per milliliter of (clean catch) of urine or $> 10^2$ CFU/mL of urine and 3 of the following symptoms: fever ($\geq 100^\circ\text{F}$), chills, dysuria, altered urine characteristics (eg, specificity gravity, color, hematuria), altered voiding patterns (eg, urgency), altered mental status (delirium), or suprapubic/flank pain.^{5,7}

An aUTI diagnosis is given when there is bacturia ($< 10^5$ CFU/mL) in 2 consecutive urine samples and no clinical symptoms.⁷⁻⁹

Evidence-based UTI treatment guidelines for older adults indicate that antibiotics are only indicated for the treatment of sUTIs.^{5,7,10} Antibiotics are not indicated when the resident presents with bacturia and no symptoms (aUTIs), as colony-forming bacteria are found in 90% of elderly LTCF residents.^{7,11} Evidence-based supportive (nonpharmacologic) treatment strategies for aUTIs are similar to preventive strategies and include the

consumption of cranberry juice or supplements, increasing fluid intake, and increasing voiding frequency.^{10,12,13}

Projections suggest that the number of older adults will soon exceed the number of health care professionals with the necessary knowledge and skills needed to provide geriatric-specific (complex and specialized) collaborative care.¹⁴ Along with these demographic projections, the risk associated with inappropriate antibiotic use (eg, multidrug-resistant strains of bacteria)² mandates that prescribing practitioners (nurse practitioners, physicians, and physician assistants) differentiate between sUTIs and aUTIs, both of which are associated with bacturia in geriatric patients.⁷

The purpose of this study is to determine whether hiring a nurse practitioner (NP) within the LTCF improves rates of evidence-based treatments for aUTIs among older adults in an LTCF. After identifying elderly LTCF residents with aUTIs, we describe their antibiotic and supportive treatments before and after hiring an NP.

METHODS

After receiving approval from the institutional review board of Robert Morris University and the LTCF board, data were retrospectively collected from infection control logs, residents' medical records, and

Table 1. Demographic Characteristics of the Study Sample (N = 89)

Characteristics	Total Sample	Pre-NP (n = 40)	Post-NP (n = 49)	Statistic	P-value
Age in years [mean (SD)]	79.6 (8.07)	79.6 (8.07)	78.1 (7.76)	Mann-Whitney U-test	.35
Gender [% (n)]				$\chi^2 = 0.642$	
Female	57.3% (51)	60.0% (24)	55.1% (27)		.6722
Male	42.7% (38)	40.0% (16)	44.9% (22)		
Race [% (n)]				$\chi^2 = 0.114$.123
Caucasian	58.4% (52)	62.5% (25)	55.1% (27)		
African-American	36% (32)	37.5% (15)	34.6% (17)		
Other	5.6% (5)	0% (0)	10.2% (5)		

NP = nurse practitioner.

clinical progress notes of a 178-bed LTCF. We identified residents with a diagnosis aUTI and characterized their pharmacologic (antibiotic) and supportive treatment strategies (increasing fluid intake, increasing voiding frequency, and/or drinking cranberry juice). Data were collected from June 2012 to December 2013. This time frame allowed for data collection 9 months before and 9 months after an NP was hired by the LTCF. Residents were excluded from the study if they were new to the facility (< 6 months); < 65 years old; had an indwelling urinary catheter; or were receiving hemodialysis, long-term antibiotic therapy, and/or immunosuppressive treatments or medications.

Data Analysis

Microsoft Excel software was used for the statistical analysis. To test for statistically significant differences in sample characteristics and aUTI treatment strategies after hiring an NP, Mann-Whitney U-tests were used for continuous data (ie, age) and Pearson's χ^2 analyses were used for categorical data (ie, gender, race, and treatment strategies).

Study Sample

The sample consisted of 40 cases of aUTIs in the 9 months before and 49 cases of aUTIs in the 9 months after hiring an NP at the LTCF. Although the residents with cases of aUTIs ranged in age from 66 to 90 years, the typical resident with aUTI was an 80-year-old Caucasian female. There were no significant age, gender, or racial differences among

residents with aUTIs before and after employing the NP at the facility (see Table 1).

Study Results

The proportion of residents being appropriately treated with evidence-based supportive treatments for aUTIs improved significantly after hiring the NP. Yet, the proportion of residents with aUTIs being inappropriately treated with antibiotics did change after hiring the NP. Although the proportion of residents with aUTIs treated with antibiotics decreased from 86.2% to 78.1% after employing the NP, this drop in inappropriate antibiotic prescribing rates was not statistically significant. On the other hand, a significant proportion of residents with aUTIs were treated with increased fluid intake (46.8%), frequent toileting schedules (45.5%), and cranberry juice or supplements (24.3%) after hiring the NP (see Table 2).

DISCUSSION

In the LTCF we studied, evidence-based guidelines for the treatment of aUTIs in older adults^{5,7} were not systematically applied. The proportion of residents aUTIs treated with supportive strategies improved significantly after the NP was hired. Yet, the proportion of residents inappropriately treated with antibiotics was not significantly reduced after employment of the NP. These findings are contrary to the literature that suggests NPs work closely with physicians and other disciplines to deliver comprehensive and appropriate care in LTCFs.^{4,15}

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