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Original Study

The Development of a Decision Tool for the Empiric Treatment of Suspected Urinary Tract Infection in Frail Older Adults: A Delphi Consensus Procedure

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A B S T R A C T

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Objectives: Nonspecific signs and symptoms combined with positive urinalysis results frequently trigger antibiotic therapy in frail older adults. However, there is limited evidence about which signs and symptoms indicate urinary tract infection (UTI) in this population. We aimed to find consensus among an international expert panel on which signs and symptoms, commonly attributed to UTI, should and should not lead to antibiotic prescribing in frail older adults, and to integrate these findings into a decision tool for the empiric treatment of suspected UTI in this population.

Design: A Delphi consensus procedure.

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Setting and Participants: An international panel of practitioners recognized as experts in the field of UTI in frail older patients.

Measures: In 4 questionnaire rounds, the panel (1) evaluated the likelihood that individual signs and symptoms are caused by UTI, (2) indicated whether they would prescribe antibiotics empirically for combinations of signs and symptoms, and (3) provided feedback on a draft decision tool.

Results: Experts agreed that the majority of nonspecific signs and symptoms should be evaluated for other causes instead of being attributed to UTI and that urinalysis should not influence treatment decisions unless both nitrite and leukocyte esterase are negative. These and other findings were incorporated into a decision tool for the empiric treatment for suspected UTI in frail older adults with and without an indwelling urinary catheter.

Conclusions: A decision tool for suspected UTI in frail older adults was developed based on consensus among an international expert panel. Studies are needed to evaluate whether this decision tool is effective in reaching its aim: the improvement of diagnostic evaluation and treatment for suspected UTI in frail older adults.

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Mrs X, a frail, 85-year-old woman, is a “little agitated” and “just not herself today.” After assessing Mrs X, her nurse decides to perform a dipstick test on a urine sample, which is found to be positive for nitrite and leukocyte esterase. Mrs X’s physician is contacted and told of the positive dipstick results. The physician orders a urine culture and begins empiric antibiotic therapy.

This clinical scenario occurs routinely in older adults residing in long-term care facilities (LTCF)^{1–4} and is similarly prevalent in noninstitutionalized frail older adults.⁵ Symptoms like “agitation,” “not being him/herself,” and a broad range of other nonspecific signs and symptoms (S&S) are frequently attributed to urinary tract infections (UTIs).^{1–6} If a dipstick test or urinalysis is positive, this is interpreted as confirming the diagnosis, and antibiotic prescribing often follows.^{4,5}

There are, however, serious concerns regarding this practice. First, many conditions in the frail older patient present atypically, so a broad range of possible causes should be considered when any nonspecific S&S are present.⁴ Furthermore, at any time, up to 50% of urine samples from nursing home residents who are not unwell test positive for nitrite (100% of catheterized patients), and up to 90% for leukocyte esterase.^{1,5,7–9} Thus, there is a high a priori likelihood of positive results when performing urine tests (ie, dipstick, urinalysis, or urine culture) in this population. Hence, there is no gold standard to distinguish between asymptomatic bacteriuria and true UTI.⁸ Consequently, the practice of attributing nonspecific S&S to possible UTI and performing urine tests to confirm this diagnosis promotes inappropriate antibiotic prescribing.

Inappropriate antibiotic prescribing is undesirable both on the patient level, because of potential side effects and drug interactions, and on the societal level because of its contribution to antimicrobial resistance. In a recent guideline-based evaluation of treatment decisions for UTI in Dutch nursing home residents, 32% of antibiotic prescriptions were judged as inappropriate.¹⁰ Other reports describe even higher percentages of inappropriate antibiotic prescribing for presumed UTI, ranging from 35% to 93%.^{11–16}

Minimum criteria for the initiation of antibiotics for UTI in frail older adults have been previously developed.^{4,17} These criteria have in common that they focus on the presence of urinary tract related S&S and do not incorporate nonspecific S&S, whereas these nonspecific S&S commonly trigger a UTI suspicion in practice, as illustrated by the above scenario.^{1–6} However, the role of nonspecific S&S in the diagnosis of UTI in frail older adults remains poorly understood.^{4,17,18}

This article reports results from an international Delphi process with the following aims: (1) reach expert consensus on which S&S, commonly attributed to UTI in frail older adults, should and should not result in empiric antibiotic prescribing; and (2) produce a practical decision tool for diagnostic evaluation and empiric antibiotic

treatment of suspected UTI in frail older adults with and without an indwelling urinary catheter.

Methods

Study Design

A Delphi procedure was performed to reach consensus on antibiotic prescribing for S&S that are attributed to UTI in frail older adults. In this procedure, a group facilitation technique is used to transform expert opinion into group consensus through a series of structured questionnaire rounds. Each questionnaire contains the anonymized results from the previous round(s), and participants are asked to consider these results in their replies in the subsequent questionnaire rounds.¹⁹ Consensus was defined as an agreement level of at least 75%.²⁰

Expert Panel

The Delphi moderators (L.B., H.V., C.H.) selected international experts based on their multiple research activities and clinical expertise in UTI in frail older patients. They were invited to participate by e-mail in April 2016. They were also asked whether they had suggestions for other experts whom they believed should be part of the panel. Experts were not informed about the other persons invited for the study or about those participating until completion of the study.

Delphi Rounds

Four Delphi rounds were conducted between May 2016 and March 2017. Questionnaires were prepared by the research team (L.B., H.V., C.H.) and tested for content, clarity, and lay-out by 2 or more members of a pilot panel. This panel consisted of four elderly-care physicians (ie, a medical specialty in The Netherlands focused on care of the frail older patient).

Round 1 and 2: Individual S&S

The research team prepared a list with 38 S&S (Table 1) recognized as being attributed to UTI (defined as cystitis and pyelonephritis) in practice.^{4,5,18,21–25} These S&S were presented to the expert panel in random order in the first round, and grouped into 4 categories in the second round: S&S related to the urinary tract, nonspecific S&S, S&S related to the character of urine, and systemic S&S. Experts were asked to evaluate each sign or symptom individually (ie, regardless of context and the presence of other S&S), for the likelihood that it is caused by UTI (not likely/more unlikely than likely/more likely than unlikely/likely). Specific and general comments relevant to S&S were

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