

DEFINITION OF RECURRENT URINARY TRACT INFECTIONS IN WOMEN: WHICH ONE TO ADOPT?

Hypothesis / aims of study

Recurrent urinary tract infections (RUTI) in women is a growing health care concern, complicated by management issues related to antibiotic resistance profiles and allergies. For those involved in clinical research, the other challenge is to adopt a definition that is acceptable to all reviewers. We reviewed the various definitions of RUTI recommended by experts and specialty societies to try to reach some consensus.

Study design, materials and methods

A PUBMED search was conducted between 1965 and 2016 on all authors, Clinical Societies, or Guideline Panels on the topic of "RUTI in women." The data was collated based on textual information (Table 1) and then extracted by key topics (Table 2) including urinary symptoms, pyuria on urinalysis, positive nitrates in dipstick, midstream urine collection, urine culture threshold findings in CFU/ml, urine positivity, definition of persistence vs reinfection, interval time between UTI, and negative intervening urine cultures. All data were reviewed by two separate investigators.

Results

The definition of RUTI is highly variable in the literature, ranging from very few criteria such as urinary symptoms and pyuria, to more complex definitions including a negative intervening culture and interval time between recurrences. The separation between persistence and reinfection was often mentioned. The tallying of key elements in this existing list of definitions suggests that a minimum RUTI definition should include urinary symptoms, urine culture CFU/ml threshold, differentiation of bacterial persistence vs reinfection by bacterial species, number of UTIs per year, and negative intervening urine cultures. Other important components of this definition should include bacterial strain differentiation and time interval between infections.

Interpretation of results

The existence of variable definitions of RUTI hampers research in this field as well as the quality of the published data. Authors can reference from very simple to more complex RUTI definitions. This review of major RUTI definition recommendations by expert individuals and specialty societies underlines the lack of uniformity and the need for a more robust and generally agreeable RUTI definition for future studies.

Concluding message

Although RUTI is a recognized clinical entity of growing concern in the field of women health care, its definition was found highly variable in the literature, highlighting the need for a consensus in order to help the quality and comparability of future clinical reports.

Table 1. Summary of key contextual elements of various RUTI definitions						
Source	Year	Definition				
McGeachie ¹	1966	"Where the recurrence is associated with a different species... then little doubt can exist that this is a reinfection. However, where the species isolated is the same in both episodes then the differentiation requires further classification other than biochemical. "				
Mabeck ²	1972	"Failure is defined as persistence of bacteriuria during treatment, and recurrence as reappearance of bacteriuria after a period with less than 10 ⁴ organisms/ml mid-stream urine. Recrudescence is recurrence with bacteria of the same species and serotype as found before the treatment, while reinfection is defined as change in the urinary flora or recurrence with a different organism."				
Schaeffer ³	1980	"Individuals with 3 episodes in 1 year or 2 episodes in 6 months that were either bacteriologically documented or judged compatible with urinary tract infections were included in the study."				
Hooton ⁴	2001	"A recurrence is often defined clinically as a relapse if it is caused by the same species... and if it occurs within 2 weeks after treatment . It is considered a re-infection if it occurs more than 2 weeks after treatment of the original UTI. An exception would be the situation, where a post-treatment urine culture has been investigated and produced no growth of the uropathogen- in which case any subsequent recurrence is a re-infection."				
ACOG Practice Bulletin ⁵	2008	"Recurrent UTI with the same organism after adequate therapy is termed a relapse. Reinfection is a recurrent UTI caused by bacteria previously isolated after treatment and a negative intervening urine culture result or a recurrent UTI caused by a second isolate. "				
IUGA/ICS ⁶	2009	"Recurrent urinary tract infections (UTIs): at least three symptomatic and medically diagnosed UTI in the previous 12 months. The previous UTI(s) should have resolved prior to a further UTI being diagnosed. "				
SOGC Clinical Practice Guideline ⁷	2010	"When there is recurrent infection with the same organism despite adequate therapy, it is considered a relapse. Reinfection is defined as recurrent UTI caused by a different bacterial isolate, or by the previously isolated bacteria after a negative intervening culture or an adequate time period (≥ 2 weeks) between infections. "				
EAU- International Consultation on Urological Diseases ⁸	2010	"Bacterial persistence... is cause by reemergence of bacterial from a site within the urinary tract and may be due to a nidus for persistent infection that cannot be eradicated. As a result, the same pathogen is identified in recurrent infections, but episodes of sterile urine may occur during and shortly following antimicrobial treatment.... In reinfection, each episode can be caused by a variety of new infecting organisms. Confusion in this form of pathogenesis sometimes occurs because Echerichia coli... occur in many different serotypes; thus, recurrent Echerichia coli UTI does not equate to infection with the same organism. With serotyping, re-infection can be established, but this is rarely done in the routine clinical setting."				
CUA Guideline ⁹	2011	"In bacterial persistence, the same bacteria may be cultured in the urine 2 weeks after initiating sensitivity-adjusted therapy. A reinfection is a recurrent with a different organism, the same organism in more than 2 weeks after treatment, or a sterile intervening culture. "				
EAU Guidelines on urological infections ¹⁰	2015	" At least three episodes of uncomplicated infection documented by culture in past 12 months. ... Bacterial persistence may be due to a nidus for persistent infection in the urinary tract. Surgical correction or medical treatment for urinary dysfunction may be needed. Reinfection: each episode is a new infection acquired from periurethral, perineal, or rectal flora."				
Campbell-Walsh Urology ¹¹	2015	"Reinfection describes a new event associated with reintroduction of bacteria into the urinary tract from outside. Bacterial persistence refers to a recurrent UTI caused by the same bacteria reemerging from a focus within the urinary tract. ... bacterial persistence must be cause by... Table 2. Summary of key elements in various RUTI definitions at varying and sometimes long intervals. Bacteria are cultured by different methods and definitions are characteristic. Reinfections usually occur at varying intervals. Number of different species Interval time between infections Negative intervening culture				
		Symptoms	UTI/year	species	Interval time between infections	Negative intervening culture
McGeachie ¹	1966		x	x		x
Mabeck ²	1972	x		x		
Schaeffer ³	1980	x	x			
Hooton ⁴	2001	x		x	x	x
ACOG Practice Bulletin ⁵	2008	x		x		x
IUGA/ICS ⁶	2009	x			x	x
SOGC Clinical Practice Guideline ⁷	2010	x		x	x	x
EAU- International Consultation on Urological Diseases ⁸	2010	x		x		
CUA Guideline ⁹	2011	x		x	x	x
EAU Guidelines on urological infections ¹⁰	2015	x		x	x	
Campbell-Walsh Urology ¹¹	2015	x		x	x	
Total		10	6	8	5	4

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Disclosures

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