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# Actual role of older oral antibiotics in the treatment of resistant Urinary Tract Infections (UTIs)

Ercole Concia<sup>1</sup>, Giuseppe Cornaglia<sup>2</sup>, Andrea Novelli<sup>3</sup>

<sup>1</sup>Infectious Diseases and Tropical Medicine Section, Diagnostic and Public Health Department, University of Verona, Verona, Italy, <sup>2</sup>Department of Diagnostics and Public Health, University of Verona, Verona, Italy, <sup>3</sup> Department of Health Sciences, Clinical Pharmacology and Oncology Section, University of Florence, Florence, Italy

## Introduction

Uncomplicated urinary tract infections (UTIs) are the most frequent type of infection. They are primarily seen in outpatients, mostly in women, and considered easy-to-manage from a clinical and therapeutic point of view. However, urine cultures are not usually performed and, when performed, reports arrive too late. Therefore, an empiric approach to therapy is required.

Over recent years, the use (or abuse) of empirical treatment for UTIs by general practitioners and specialists has contributed to a significant increase in bacterial resistance worldwide. This is especially relevant for the most important uropathogens, *Escherichia coli* and *Klebsiella pneumoniae*. Antibacterial resistance severely undermines the usefulness of some drugs as empiric therapy for UTIs, including agents that have previously been widely used in this indication, such as co-trimoxazole, quinolones and most beta-lactams.

The treatment of UTIs caused by multi-drug-resistant (MDR) bacteria would require the use of more effective and expensive injective antibiotics, such as carbapenems, which are still reserved mainly for hospital use. As a result, and due to the lack of new effective antibiotics, some 'old' compounds, such as fosfomicin trometamole, nitrofurantoin and pivmecillinam, are now being reconsidered for the management of uncomplicated UTIs because these agents retain their microbiological and clinical activity against most MDR uropathogens.

In this supplement, the following topics will be discussed:

- European and world-wide epidemiology of MDR Gram-negative strains causing UTIs, with a special focus on *E. coli* and *K. pneumoniae* producing extended spectrum beta-lactamases (ESBLs);
- Pharmacokinetic and pharmacodynamic properties of the most common oral drugs used in the treatment of UTIs, as well as the pharmacological and therapeutic strategies for limiting or preventing bacterial resistance;
- The therapeutic approaches suggested for uncomplicated UTIs, especially uncomplicated and recurrent cystitis, as well as complicated UTIs, such as catheter-related UTIs and UTIs in males, post-menopausal women and diabetic patients, according to the main international guidelines.

Taken together, these data confirm that, based on pharmacokinetic/pharmacodynamic characteristics, microbiological and clinical activity, safety and compliance, some 'old' antibiotics, and in particular, fosfomicin trometamole, remain valid options for the management of uncomplicated UTIs in outpatients.

## Contents

- (1) Multi-drug-resistant Gram-negative bacteria causing urinary tract infections: a review.
- (2) Pharmacological properties of oral antibiotics for the treatment of uncomplicated urinary tract infections.
- (3) Clinical evaluation of guidelines and therapeutic approaches in multi-drug-resistant urinary tract infections.

Correspondence to: Andrea Novelli, Department of Health Sciences, Clinical Pharmacology and Oncology Section, University of Florence, Viale G. Peraccini 6 50139 Florence, Italy. Emails: andrea.novelli@unifi.it; andrea.novelli51@gmail.com