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Efficacy of Nitrofurantoin in Treating Urinary Tract Infections

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Abstract: *Urinary tract infections are often caused by bacteria resistant to antibiotics which have evolved to be a major health issue in recent years. Often, urinary tract infections are very hard to treat and if not appropriately treated in time, may result in serious consequences, particularly, when it spreads to kidneys ultimately resulting in an increase in morbidity and mortality. Nitrofurantoin, a first line agent and has bactericidal action, frequently used to treat uncomplicated urinary tract infection. The literature was searched with published sources from Medline, PubMed and Embase search engines. Published articles were searched, of which 81 articles were eligible to be included for this systematic review. Nitrofurantoin is reduced by the action of bacterial flavoproteins to reactive intermediate compounds that non-specifically inactivate ribosomal proteins resulting in inhibition of protein synthesis. Various mechanisms seem to be responsible for the reduced capability of microorganism to acquire resistance in a faster manner. Nitrofurantoin exhibits high quality success against most bacteria anticipated in urinary tract infection. Nitrofurantoin has been recommended for prophylaxis in the treatment of reinfection in case of recurrent uncomplicated urinary tract infections in many western countries. Nitrofurantoin is one of the treatment options for urinary tract infection due to extended spectrum beta lactamase producing Escherichia coli. In pregnant women with urinary tract infection, nitrofurantoin can be appropriate treatment. Also, nitrofurantoin associated reactions have been reported in many studies. This review updates the clinical use of nitrofurantoin, including new facts about the role of nitrofurantoin in the therapy of community acquired urinary tract infection, adverse outcomes, complications, interactions and antibiotic resistance mechanism against different uropathogens.*

Nitrofurantoin is an old antibiotic and an important first-line oral antibiotic for the treatment of uncomplicated urinary tract infections. However despite its long term use for over 60 years, little information is available with respect to its dose justification and this may be the reason of highly variable recommended doses and dosing schedules. Furthermore, nitrofurantoin is not a uniform product -crystal sizes of nitrofurantoin, and therefore pharmacokinetic properties, differ significantly by product. Moreover, pharmacokinetic profiling of some products is even lacking, or difficult to interpret because of its unstable chemical properties. Pharmacokinetic and pharmacodynamic data is now slowly becoming available. This review provides an overview of nitrofurantoins antibacterial, pharmacokinetic and pharmacodynamic properties. This shows that a clear rationale of current dosing regimens is scanty.

Keywords: pharmacokinetics; pharmacodynamics; urinary tract infections; antibiotic, Pain relief

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