Nitroxolin does not result in microbiological eradication in geriatric patients with lower urinary tract infection: a prospective cohort study

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Background: Nitroxoline, 5-nitro-8-hydroxyquinoline, is an oral urine antiseptic approved for treatment of acute and chronic urinary tract infection (UTI) in 1967. Nearly 50 years later, it still has broad in vitro activity against Gram-positive and Gram-negative uropathogens. The aim of the present study was to evaluate the microbiological efficacy of a seven-day course of oral nitroxoline in geriatric patients with lower UTI.

Material/methods: In a prospective single-centre cohort study 30 hospitalized geriatric patients with lower UTI were recruited to receive nitroxoline 250 mg three times daily for seven days. Primary outcome was the proportion of patients with microbiological success defined by a reduction of bacterial count in urine culture to <10000 cfu/mL on day 12. Secondary outcomes were the microbiological and clinical efficacy and safety of nitroxoline under treatment (day 3), at end of treatment (day 7) and after treatment (on day 12).

Results: Twenty-nine of 30 patients had a microbiologically confirmed UTI with a bacterial count ≥100000 cfu/mL in urine culture at baseline. On day 12, 20 (66.7%) patients of the intention-to-treat population and 12 (85.7%) patients of the per-protocol population were free of any clinical symptoms
of UTI, but microbiological success was only detected in a single patient (3.3% of the intention-to-treat population and 7.1% of the per-protocol population). In 3 patients development of resistance was observed under treatment by a 4 to 8-fold increase in minimum inhibitory concentration to nitroxoline in Enterobacteriaceae. Nitroxoline was mostly well tolerated but treatment was discontinued prematurely in 2 patients because of nausea. Mean urinary concentrations of nitroxoline and nitroxoline sulphate were 1.8 mg/L (range 0.1–9.2 mg/L) and 56.4 mg/L (range 0.6–284.8 mg/L) on day 3. No significant correlation between bacterial count in urine cultures and urinary concentration of nitroxoline, metabolite, calcium, magnesium, iron, zinc or pH-value could be detected (p>0.05).

Conclusions: Nitroxoline treatment was associated with improvement of symptoms but failed to achieve microbiological efficacy in >90% of hospitalized geriatric patients with lower UTI.