EDITORIAL

Prescribing Behavior in Urinary Tract Infection

Inadequate Implementation of Guidelines in Clinical Practice

Florian M. E. Wagenlehner, Kurt G. Naber

Editorial to accompany the article: "A Survey of Outpatient Antibiotic Prescribing for Cystitis," by Velasco et al., in this issue of *Deutsches Ärzteblatt International*

Urinary tract infections (UTI) are among the commonest bacterial infections in ambulatory medicine and thus account for a large fraction of outpatient prescriptions for antibiotics. The overall use of antibiotics by the population is a major factor in the development of antibiotic resistance. Thus, changes in prescribing practices may significantly affect antibiotic resistance rates in the community.

Velasco et al. (1) present an analysis of the responses of 1810 physicians in private practice to a nationwide cross-sectional survey taken in 2008: For 715 of them (39.5%), uncomplicated UTI was the most common reason for an antibiotic prescription. 65% of the respondents were general practitioners and 21% were gynecologists. Further goals of the survey were to assess

- the physicians' antibiotic-prescribing behavior
- and their individual knowledge about antibiotics, antibiotic resistance, and important issues in antibiotic treatment.

Large numbers of prescriptions

A high percentage of respondents said they prescribed antibiotics every day (61%) or at least once a week (91%). This underscores the importance of ambulatory medicine as a contributor to overall antibiotic use. In 2008, a majority (61%) of the physicians surveyed prescribed cotrimoxazole empirically to treat uncomplicated UTI, followed by 21% who prescribed fluoroquinolones. Far fewer physicians prescribed penicillins (ca. 5%), cephalosporins (3%), tetracyclines (2%), or macrolides (1%). Moreover, the authors found that the following groups of physicians more commonly prescribed fluoroquinolones:

- physicians in the former East Germany,
- physicians who tended to switch empiric treatment to targeted treatment based on test results,
- and physicians who said they wanted to spare their patients inconvenience.

Interestingly, a microbiological examination of the urine before the initiation of antibiotic treatment does have a small effect on prescribing behavior even for uncomplicated cystitis. It was assumed till now that sensitivity testing in this disease entity generally does not change antibiotic prescribing at all. The reason for the assumption was that the antibiotic treatment of

uncomplicated cystitis, at least with fluoroquinolones or with cotrimoxazole, is generally short-term, lasting only about three days; thus, the treatment is usually over before the resistance pattern of the responsible pathogen has been determined.

Epidemiological side effects

The survey whose findings are analyzed here by Velasco et al. was carried out about two years before the publication of the current versions of the treatment guidelines for uncomplicated UTI in Germany and abroad. Important publications on the altered pattern of antibiotic resistance in uncomplicated UTI had already appeared (2–4), but these data were still too new to have been incorporated into the guidelines. Rather, in 2008, a North American guideline dating back to 1999 was still in effect (5) that recommended fluoroquinolone treatment for uncomplicated UTI as an alternative to trimethoprim/cotrimoxazole because of increasing resistance of *E. coli* to the latter drug. More recently, however, increasing rates of resistance to both trimethoprim/cotrimoxazole and fluoroquinolones among pathogens causing uncomplicated UTI have necessitated reconsideration of the treatment recommendations for this disease. Today, more weight is given to the fact that broad-spectrum antibiotics such as fluoroquinolones or cephalosporins are more likely to have epidemiologic side effects, i.e., to breed resistant pathogens by natural selection, than other antibiotics with a narrower efficacy profile. These issues have been taken into account in the interdisciplinary S3 guideline on the treatment of uncomplicated UTI, as reflected in the treatment recommendations (6):

- trimethoprim/cotrimoxazole and fluoroquinolones are now no longer recommended as drugs of first choice for the empirical treatment of acute, uncomplicated cystitis,
- and the current drugs of first choice are: fosfomycin/trometamol, nitrofurantoin, and pivmecillinam (not listed in Germany).

In areas where the local resistance rate of *E. coli* to trimethoprim/cotrimoxazole is under 20%, trimethoprim/cotrimoxazole can still be used for first-line treatment. These recommendations of the German guideline are also found in international and overseas guidelines, such as those of the Infectious Diseases Society of

Department of Urology, Pediatric Urology and Andrology, Medical Faculty of the Justus Liebig University Giessen: Prof. Dr. med. Wagenlehner
Straubing: Prof. Dr. med. Dr. h.c. Naber

America (IDSA)/European Society for Microbiology and Infectious Diseases (ESCMID) (7) and of the European Association of Urology (EAU)/European Section of Infection in Urology (ESIU) (8).

Measuring guideline implementation

The study by Velasco et al. (1) makes an important contribution to our knowledge of private practitioners' antibiotic-prescribing behavior for the diagnosis most commonly treated with antibiotics in the outpatient setting, i.e., uncomplicated UTI. The S3 guideline recommendations (11) were featured in multiple German and international publications in 2010 and 2011 (6–11) in an effort to promote their implementation, but the actual degree of implementation that resulted can only be measured by studies such as this one (1). Such studies are important because they can not only demonstrate the successful implementation of guidelines, but also reveal potential weak spots or obstacles to their implementation. Another study of this type should be performed again soon to assess the changes in prescribing behavior that have followed the introduction of the new guideline recommendations, with the potential benefit of promoting their implementation.

Conflict of interest statement

Prof. Wagenlehner has served as a paid consultant for Astellas, AstraZeneca, Cernelle, OM-Pharma, Lilly, Pierre Fabre and Rosen-Pharma. He has received lecture honoraria from AstraZeneca, OM-Pharma, Pierre Fabre and Rosen Pharma. He has been paid for performing clinical trials on behalf of Astellas, AstraZeneca, Calixa, Cereza, Cernelle, Cubist, GSK, Merlion, OM-Pharma, Janssen-Cilag, Johnson & Johnson, Lilly Pharma, Pharmacia, Pierre-Fabre, Rosen Pharma, Sanofi-Aventis, Strathmann, Zambon, and Serag-Wiessner.

Prof. Naber has received consultant's fees and payment for authorship of a publication touching on the theme of this article from Bionorica, OM-Pharma, Vifor, Pierre Fabre, Zambon, Angelini, Rosen Pharma, and Daiichi Sankyo. He has received payment for expert evaluations for Bionorica, OM-Pharma, Vifor, Pierre Fabre and Rosen Pharma. He has received reimbursement of attendance fees at continuing medical education meetings and of travel and accommodation costs, as well as payment for the preparation of continuing medical education sessions, from Bionorica, OM-Pharma, Vifor, Pierre Fabre, Zambon, Rosen Pharma, and Daiichi Sankyo. He has received money from Bionorica, OM-Pharma, Vifor, Pierre Fabre, Zambon, and Rosen Pharma for clinical trials performed on their behalf as well as for a research project that he initiated.

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Corresponding author

Prof. Dr. med. Florian M. E. Wagenlehner
Klinik und Poliklinik für Urologie, Kinderurologie und Andrologie
Universitätsklinikum Giessen und Marburg GmbH, Standort Giessen
Justus-Liebig-Universität Giessen
Rudolf-Buchheim-Str. 7
35385 Giessen, Germany
Wagenlehner@aol.com

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