Management of lower urinary tract infection in women by Slovene GPs

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**Background.** Uncomplicated lower urinary tract infection (LUTI) is one of the most common infections treated in general practice. Although nationwide treatment guidelines for LUTI are increasingly available, most European countries, including Slovenia, have not yet set such guidelines.

**Objectives.** Our aim was to describe Slovene GPs’ management of uncomplicated LUTIs and to analyse doctor and surgery characteristics that influence this management.

**Method.** A written case vignette accompanied by open-ended questions regarding doctors’ decisions (i.e. investigations and laboratory tests ordered, treatment options, advising sick leave, advice for treatment and follow-up procedures) and questions about doctor and surgery characteristics was sent to a representative sample of Slovene GPs.

**Results.** The response rate was 129/171 (75.4%). There were large variations in management of LUTI: 17.8% of GPs ordered various additional laboratory tests; 57% of GPs prescribed trimethoprim/sulfamethoxazole and 37% norfloxacin; 30% of GPs prescribed a drug for 10–14 days; and 53.5% of GPs put the patient on sick leave of 1–10 days duration. Doctors with heavier workloads and those who have to wait for laboratory results for >24 h ordered more additional investigations.

**Conclusions.** Effective strategies for quality improvement are needed, together with practice guidelines. The influence of a heavier workload on management of LUTI and the impact of the accessibility of laboratory tests should be explored in future research.

**Keywords.** Decision making, family practice, process assessment (health care), task performance and analysis, urinary tract infections.

**Introduction**

Uncomplicated lower urinary tract infection (LUTI) is one of the most common infections treated in general practice. Over 50% of women have at least one episode of uncomplicated LUTI during their lifetime, and 20–30% will have recurrent episodes. The infection is caused most commonly by *Escherichia coli* and *Staphylococcus saprophyticus*. The symptoms include dysuria, burning pain, urgency, frequency, low volume of urine, pain in the lower abdomen, low back pain and a change in the smell of urine. The diagnosis is based on characteristic findings and confirmed by urine sample; positive nitrates and bacteria in urine sediment are used for confirmation. Further diagnostic procedures (urine culture, blood tests) are not needed for the confirmation of uncomplicated LUTI. Symptomatic outcome is the same after antibacterial treatment whether the patient is classified as having acute cystitis or the acute urethral syndrome. Consequently, the GP may rely on symptoms alone when starting antibacterial treatment in adult women with suspected cystitis. The infection is regarded as uncomplicated in otherwise healthy women who are younger than 65 years; in the absence of functional or anatomic complications, pregnancy, diabetes mellitus, immunodeficiency, recent urological manipulations or operations; in cases where the patient has not been treated with antibiotics very recently; and where the infection was not acquired in a hospital.

The treatment includes a course of antibiotics and advice to take sufficient quantities of liquids (2–3 l per day). The therapy of choice is trimethoprim 160 mg or trimethoprim/sulfamethoxazole 160 mg/800 mg twice daily for 3 days. A single-dose antibiotic treatment for LUTI in women is less effective than the conventional...
management of uncomplicated infections is that there is no need for a follow-up visit, unless the symptoms persist. LUTI is a straightforward infection, for which guidelines can be easily developed and, due to the high incidence of LUTI, there is a clear need for clinical guidelines. However, Slovenia, like most European countries, still does not have national guidelines for the management of LUTI in general practice.

One of the first steps in the development of guidelines is an assessment of existing clinical practice in order to identify areas for improvement and address GPs’ specific educational needs in order to be able to assess the overall impact of guidelines. Since no data on treatment practices are available, we conducted a study to explore the management of uncomplicated LUTI in women in general practice and to explore the relationship between the characteristics of doctors’ and their practices and decisions made regarding the management of LUTI.

Method

A cross-sectional study in a representative sample of Slovene GPs was undertaken. From a national register of GPs, a random sample of 198 practitioners was drawn, which represents 25.5% of all GPs in the country. Of these, 16 GPs were not available because they had changed their careers, six were retired and three were on maternity leave. The remaining 173 participants were approached either by telephone by one of the researchers (JC) (100 participants) or personally by tutors affiliated to the Department of Family Medicine, University of Ljubljana (73 participants). The aims of the study and the process of data collection were explained, and only two refused to participate. Questionnaires with an SAE were sent to 171 GPs who had agreed to take part in the survey. Participating GPs were representative of the whole population of Slovene GPs in terms of available data [age, gender, type of practice (public service versus private practice) and the regional distribution of the practices]. Those who had not responded after a month were contacted once by telephone but, if this failed, no further contact was made. The National Ethical Committee approved the study.

In nationwide studies, case vignettes are a method of choice which yield focused insights in disease management and facilitate the adoption of national guidelines. Case vignettes offer standardized ‘patients’ for whom the diagnosis and the treatment strategies are already known. The method has proven to be of value equivalent to that of simulated patients. Vignettes are used in research even for complex cases such as depression.

Nevertheless, the interpretation of the data must be undertaken with care, since the situation in actual cases is different because, for example, the time pressure factor is excluded. On the other hand, the differences between the doctors themselves are measured with higher validity than observing real practice.

We used a questionnaire with open questions. A description of the questionnaire is presented in Box 1 and the vignette (translated from Slovene) in Box 2. The practitioners were sent a case vignette describing a female patient with a UTI, which had been used and validated in another study. The questionnaire, together with a Slovene translation of the vignette, was pre-tested in a pilot study and improved accordingly.

The responses to the vignette were compared with the best practice criteria. As mentioned earlier, the best practice means that no further additional laboratory tests to those given in the description of the patient (positive nitrite test and positive microscopic urine sediment analysis for cells and particles) were ordered and the prescribed drug was trimethoprim/sulfamethoxazole (trimethoprim alone is not available in Slovenia). Scheduling a follow-up was regarded as justified but not required. The treatment options were dichotomized into acceptable and unacceptable treatment. Prescribing trimethoprim for a 3 day course, and advice to take sufficient quantities of liquids with no other additional measures were regarded as acceptable treatment. We performed statistical analysis using SPSS software version 8.0 (SPSS Inc.). Descriptive statistics were calculated. The Student t-test and chi-square test were used according to the type of variables (where needed, Fisher’s exact test was used).

Results

We received 129 responses, a 75.4% response rate. The analysis of non-respondents showed that the differences in sex, age, training and regional distribution between respondents and non-respondents were not statistically significant. The mean age of the respondents was 45 years (range 27–69) and 47% were male. The range of working experience in general practice was from 1 to 40 years (a mean of 16 years). Fifty-five (42.6%) participants had completed vocational training for general practice (a mean of 11 years). The participants spent on average 8 days a year on continuing medical education (CME). A majority of them (63.8%) were in a group practice. The average working time was 39 h per week, and on average 45 patients per day were seen. The doctors reported on average five home visits per week. The average list size was 1866 patients. Ninety-three (72.1%) respondents participated in out-of-hours service for an average of 15 h a week (on-call service included, divided by 2 to adjust for lower workload). Sixty (46.5%) reported having an appointment system.

As many as 23 (17.8%) GPs ordered additional tests besides the positive nitrite test and positive sediment given in the description of the patient. Blood tests (ESR, leukocytes, haemogram, creatinine and urea) were
ordered by 14 GPs. Microscopic urine sediment analysis was ordered again by eight GPs and urine culture by seven. In 99.2% of cases, a drug was prescribed. Sixteen different brand names were used; the list of prescribed drugs according to the generics is given in Table 1. In addition to a prescribed drug, 15.5% of Slovene GPs prescribed uroantiseptic tea (Uvea ursi folium), a practice not followed in most other parts of western Europe and the USA. In addition, 3.9% of GPs prescribed a painkiller. A pack of trimethoprim/sulfamethoxazole contains tablets for 5 days of treatment, and a pack of norfloxacin contains tablets for 7 days of treatment. Seventy percent of GPs prescribed one pack, 28% prescribed two packs and 2% even prescribed three packs. Therefore, 30% of GPs prescribed a drug for 10–14 days treatment. A total of 53.5% of GPs put the patient on sick leave with 1–10 days duration, with a mean of 4.3 days and median of 2 days in those GPs who decided to do so. All GPs gave the patient advice regarding non-pharmacological treatment, which resulted in a long list of different advisory options (Table 2). As many as 64.3% of GPs made an appointment for a follow-up visit after 2–15 days (a mean of 6.4 days) and the rest asked the patient to come back ‘if needed’. Ten percent of GPs wrote that they would perform a urine test at follow-up.

We performed a reliability test, which showed that there was no correlation between answers on individual questions (Cronbach α 0.12).

In the second part, we analysed the associations between the factors which characterize doctors and their practices, and decisions made regarding the management of LUTI. The analysis showed the following correlations: GPs who work more than full time in general practice (we defined this as the sum of regular job hours and out-of-hours work being >42 h per week) ordered additional laboratory tests more often (P = 0.01) and prescribed longer sick leave (P = 0.03). GPs who worked more out-of-hours work were more likely to order additional laboratory tests (P = 0.05) and prescribe longer sick leave (P = 0.05). Older GPs ordered more additional laboratory tests than younger ones (P = 0.05). GPs who had to wait for laboratory results for >48 h were more likely to order additional laboratory tests (P = 0.05). GPs who carried out more home visits ordered more laboratory tests (P = 0.02). There was no correlation between

<table>
<thead>
<tr>
<th>Drug group</th>
<th>Name</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphonamides and combinations</td>
<td>Trimethoprim/sulfamethoxazole</td>
<td>57.0 (73)</td>
</tr>
<tr>
<td>Quinolones</td>
<td>Norfloxacin, ciprofloxacin</td>
<td>37.5 (46 + 2)</td>
</tr>
<tr>
<td>Semisynthetic penicillins</td>
<td>Amoxicillin+clavulanic acid</td>
<td>2.3 (3)</td>
</tr>
<tr>
<td>Uroantiseptics</td>
<td>Pipemidinic acid</td>
<td>1.6 (2)</td>
</tr>
<tr>
<td>Cephalosporins</td>
<td>Cephalexin, Cephaclor</td>
<td>1.6 (1 + 1)</td>
</tr>
</tbody>
</table>
management decisions and other factors that characterize GPs and their practices.

Discussion

The assessment of quality of care has to rely on methods that are inexpensive, reliable and able to control for case mix variation. In nationwide studies, case vignettes are a method of choice which yield focused insight into the disease management processes.

We achieved a high response rate in a representative sample of Slovene GPs, which allows us to generalize the results of the study to the whole population of GPs in the country. To our knowledge, this is also the first study using case vignettes for assessment of doctors’ performance in Slovenia.

It could be assumed that management of uncomplicated LUTI is relatively uniform, because there is a remarkably narrow spectrum of causative agents and their susceptibility to antibiotics is known. However, the findings of our study show large variations among Slovene GPs in the way they treat LUTI, and this variability is higher than in other similar studies.\textsuperscript{15,16}

Almost one-fifth of the doctors prescribed further laboratory tests in addition to nitrite and sediment, which had been given in the description of the patient. These results contrast with research data showing that infection can be managed successfully without any use of additional laboratory tests.\textsuperscript{17,18}

Fifty-seven percent of GPs prescribed the first choice drug (trimethoprim/sulfamethoxazole), and 37\% the second choice drug (norfloxacin).\textsuperscript{3} Interestingly the second choice drug has been available in Slovenia for <10 years. We can only speculate about the effect of the outreach visits of pharmaceutical representatives on treatment choices.\textsuperscript{19} One-third of the doctors prescribed 10–14 days of treatment, although 3 days of treatment has been shown to be as effective as longer courses.\textsuperscript{1} Despite reports to the contrary in the literature,\textsuperscript{1} it seems that GPs perceive LUTI as a long-lasting problem: one-third of GPs prescribed sick leave for >3 days (up to 10 days), and two-thirds of GPs scheduled the patient for a follow-up visit after a week.

Another interesting point was the variety of the advice provided to the patient. Most of the GPs recommend drinking an uroantiseptic tea from \textit{Uvea ursi folium}. We could not find any reports in the literature regarding the efficacy of this tea. Much of the advice could be described as ‘common sense advice’ (rest, warm clothes), but there is no evidence in the literature to support that these are effective. It is important to determine which recommendations provided by GPs should simply follow ‘common sense’ and which may be supported by high-quality evidence from randomized trials, should such trials be deemed necessary. The answer to this question is important if evidence-based medicine is to become standard medical practice.\textsuperscript{20}

We have used a very robust method for distinguishing acceptable from unacceptable treatment. Some treatment decisions were not included in our assessment: decisions about follow-up and advice (although sometimes very problematic) were excluded because there were no clear guidelines regarding them. The only treatment decisions we were able to use as criteria were those regarding appropriate drug therapy, length of sick leave and additional examinations. However, despite repeated attempts, it was not possible to construct a multivariate model to describe the relationship between decisions made by GPs and their characteristics (as described in Box 1). The variables that are shown to be significant in the bivariate analyses did not lead to the construction of a multivariate model; the results are somewhat confusing even from the content point of view. Some findings, for example the fact that GPs who have a heavy workload order laboratory tests more often, lead themselves to logical explanations. The finding that older doctors order them more could be attributed to the fact that they are less likely to be vocationally trained. However, the finding that GPs who perform more home visits and those who have to wait for the laboratory results for longer were associated with a higher probability of ordering additional tests appear to be counter-intuitive and cannot be explained without additional research. This differs from the findings of Flach et al., who found that reduced availability of a laboratory decreases the likelihood of testing in LUTI.\textsuperscript{21}

This first study on management of LUTI in general practice in Slovenia confirmed our hypothesis about high variability. The diversity in the management approaches appears to reflect the failure of CME in this area and/or the failure of GPs to adopt newer diagnostic and treatment strategies. Effective strategies for quality improvement accompanied by practice guidelines will now be implemented based on the findings of this study.

\begin{table}
\centering
\caption{Advice given to the patient with lower urinary tract infection}
\begin{tabular}{ll}
\hline
Advice & n \\
\hline
Drinking a lot of liquids & 87 \\
Drinking a uroantiseptic tea (\textit{Uvea ursi folium}) & 63 \\
Dietary advice & 14 \\
Dressing in warm clothes & 11 \\
Rest & 9 \\
Other (e.g. to urinate frequently, urinate before taking a tablet, ensure warm bladder; not to micturate in the sea, participate in sport, have sexual intercourse, take aspirin, walk barefoot) & 18 \\
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Acknowledgements

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References