Vpliv enostavne intervencije na večje upoštevanje smernic pri zdravljenju bolnic z nezapleteno okužbo spodnjih sečil v dežurnih ambulantah na primarni ravni

Increased adherence to treatment guidelines for lower urinary tract infections in out-of-hours primary care settings following a simple intervention strategy

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Izvleček

Namen: Cilj te raziskave je bil ugotoviti, ali lahko preprosta intervencija izboljša upoštevanje smernic za zdravljenje nezapletene okužbe sečil žensk v dežurni službi primarnega zdravstva.

Metode: Izvedli smo randomizirano prospektivno raziskavo pri bolnicah v 20 ambulantah dežurne službe primarnega zdravstva v Sloveniji (10 ambulant je bilo v interevencijski skupini, 10 pa v kontrolni). Vsaka ambulanta dežurne službe naj bi vključila 10 zaporednih bolnic, ki so prišle na pregled, bile obravnavane po telefonu oz. je bil pri njih izveden hišni obisk. Dežurne ambulante v intervencijski skupini so prejele plakat s shematično predstavitvijo smernic za zdravljenje nezapletene okužbe spodnjih sečil, ki so ga namestili na steno ambulante.

Abstract

Aim: The aim of this study was to determine whether a simple intervention could foster adherence to treatment guidelines in women with uncomplicated lower urinary tract infections (LUTIs) in after–hours primary care settings.

Methods: This was a cluster, randomised, prospective intervention study in female patients conducted in 20 out–of–hours primary care (OOHC) settings in Slovenia (10 in the intervention group and 10 in the control group). In each OOHC centre, we included 10 consecutive patients with LUTIs who sought evaluation by a physician, called in for advice, or called in for a home visit. The OOHC centres in the intervention group received a poster with a schematic presentation of LUTI

Rezultati: Od 20 povabljenih dežurnih ambulant jih je v raziskavi sodelovalo 14, od tega 7 v intervencijski in 7 v kontrolni skupini. Končni vzorec je obsegal 118 bolnic (59,0 %), od tega jih je bilo 64 v intervencijski in 54 v kontrolni skupini. Povprečna starost bolnic je bila 43,2 ± 17,3 let; 40,2 ± 16,4 let v intervencijski skupini in 46,7 ± 17,8 let v kontrolni skupini. Smernicam zdravljenja so zdravniki popolnoma sledili pri obravnavi 42 bolnic; pri 32 v intervencijski skupini in pri 10 v kontrolni skupini (p = 0,004).

Zaključek: *Enostavna intervencija lahko pomembno vpliva na upoštevanje smernic za zdravljenje bolnic z nezapleteno okužbo spodnjih sečil v dežurnih ambulantah osnovnega zdravstva.*

treatment guidelines, which was displayed on the wall in the OHC practice.

Results: *Of 20 OOHC centres, 14 were willing to participate in the study (seven in the intervention group and seven in the control group). The final sample consisted of 118 (59.0%) female patients (64 in the intervention group and 54 in the control group). The mean age of the sample was 43.2 ± 17.3 years (40.2 ± 16.4 years in the intervention group and 46.7 ± 17.8 years in the control group). Adherence to guidelines was confirmed in 42 patients (32 in the intervention group and 10 in the control group; p = 0.004).*

Conclusions: *A simple intervention can significantly enhance the adherence to treatment guidelines in patients with LUTIs managed in an OOHC centre.*

INTRODUCTION

The guidelines for the treatment of different medical conditions foster quality of patient management. Previous studies have shown that the adherence to guidelines is low in primary care settings due to various external and attitudinal barriers (1, 2, 3). Low adherence to treatment guidelines can result in an inappropriate use of antimicrobial agents, which negatively affects the efforts for lowering microbial resistance to antibiotics (4).

Inappropriate use of antibiotics in the case of uncomplicated lower urinary tract infections (LUTIs) in family medicine settings is a common problem in different countries; however, patients with urinary tract problems are not only seen in family practice settings, but also in after-hours primary care (OOHC) centres where they comprise 3%–5% of all cases in Europe (3, 5–8). LUTIs account for 1%–2% of all cases seen in OOHC centres and the adherence to treatment guidelines has also been shown to be low (9, 10). Additionally, in OOHC settings, the physicians often have to work with limited patient information with respect to medical history and medication use, which might further affect the quality of patient management (11).

It has been shown that several types of interventions might have beneficial effects on adherence to clinical guidelines in the management of various infectious diseases, including LUTIs; however, there are only a few studies that have addressed the management of LUTIs in OOHC centres (9, 12–16). A recent study in Belgium showed that a simple, multifaceted intervention improved the quality of antimicrobial prescribing. In general, however, changing the prescribing patterns is difficult and the best method of intervention is yet to be determined (9, 14).

The guidelines for the treatment of uncomplicated LUTIs in Slovenia were published in 2003 (17). Trimethoprim-sulfamethoxazole is recommended as the drug of choice at a dose of 160/800 mg every 12 hours for 3 days. In 2011, the Urology Department recommended new guidelines with the recommendation of nitrofurantoin as the drug of choice at a dose of 100 mg every 12 hours for 5 days (18). In parts of Slovenia, where the prevalence of resistance to trimethoprim–sulfamethoxazole is below 20%, trimethoprim–sulfamethoxazole can also serve as the drug of choice.

A recent study involving Slovenian OOHC centres reported that the adherence to LUTI treatment guidelines was low (10). Thus, the aim of this study was to determine whether or not a simple intervention could foster adherence to treatment guidelines in women with uncomplicated LUTIs in OOHC centres.

MATERIAL AND METHODS

Type of study and settings
This was a cluster, randomised, prospective intervention study involving female patients conducted in Slovenian OOHC walk-in centres. In Slovenia, OOHC centres are integrated with ambulance services and out-of-hospital emergency services, where physicians, in addition to telephone and walk-in office consultations, provide home visits and emergency services, the latter as a part of the emergency ambulance team. Some OOHC centres in Slovenia are located within the hospital premises, but the financing and organisation of services are separated from the financing of these hospitals (19). We randomised the OOHC centres to the intervention and control groups from a list of OOHC centres willing to participate by stratification according to region and size of the OOHC centre, so that both groups were comparable according to these features.

The study was approved by the National Ethics Committee (No. 80/01/11).

OOHC centres
There are 60 OOHC centres in Slovenia. We included 20 OOHC centres (10 in the intervention group and 10 in the control group), matched for region (rural and urban) and the number of inhabitants covered by each OOHC centre.

Patients
In each OOHC walk-in centre, we include 10 consecutive patients with LUTIs who sought evaluation by a physician, called in for advice, or called in for a home visit. The final sample target number was 200 patients (100 in the intervention group and 100 in the control group).

The inclusion criteria were as follows: female patients, 20-64 years of age, symptom duration <7 days, diagnosis of a LUTI, and informed consent. The exclusion criteria were as follows: male patients, <20 years of age, >64 years of age, pregnancy, previous episodes of LUTIs (<14 days prior to the present visit), and complicated LUTIs.

Data collection
Data collection took place between October and December 2011. The invitation for participation in the study with a detailed description of the study aim and methods was sent to the head of each OOHC centre chosen for the participation via email. Those willing to participate were sent 10 questionnaires with the instructions by surface mail. We enclosed a pre-stamped envelope with a return address. A reminder was emailed after 2 months.

The questionnaires were completed by the physician in the OOHC centre and consisted of the following questions: type of contact (surgery, telephone consultation, or home visit); patient age; duration of the symptoms prior to the visit (days); reason for the visit; the presence of symptoms (fever, abdominal pain, lumbar pain, dysuria, polyuria, urine incontinence, urine retention, haematuria, malaise, and other); whether or not the clinical examination was performed; whether or not diagnostic tests were performed and which tests; the names, dosages, and duration of the prescribed medication.

Intervention
The OOHC centres in the intervention group received a poster with a schematic presentation of LUTI treatment guidelines, which was hung on the wall in the practice. The spot for the poster on the wall was carefully chosen according to its maximum visibility. The guidelines content and the poster were also presented to the physicians working in the OOHC centres at the regular staff meeting by the Chief of the OOHC centre.

Statistical analysis

The statistical analysis was performed using SPSS 19.0 (SPSS, Inc., Chicago, IL, USA). In the bivariate analysis, we used a Mann–Whitney test and a chi-square test. The limit of statistical difference was set at $p < 0.05$.

As the main outcome variable, we used the variable "adherence to guidelines." This variable had a positive value in the case of a correct first choice of antibiotic and in case of correct treatment duration (trimethoprim/sulphametoxazole [160/800 mg every 12 hours for 3 days] and nitrofurantoin [100 mg every 12 hours for 5 days] (17, 18).

RESULTS

Of 20 OOHC centres, 14 were willing to participate in the study. Of seven OOHC walk–in centres in the intervention group, four sent complete data. Of seven OOHC walk–in centres in the control group, three sent complete data.

Demographic characteristics of patients

The final sample consisted of 118 (59.0%) female patients. Of 118 patients, three were consulted over the telephone. One hundred fifteen patients were consulted in the OOHC walk–in centre. The mean age of the sample was 43.2 ± 17.3 years.

The intervention group consisted of 64 patients, with a mean age 40.2 ± 16.4 years, and the control group consisted of 54 patients, with mean age 46.7 ± 17.8 years ($p = 0.04$).

Clinical characteristics of patients

On average, the symptom duration was 2.4 ± 1.9 days (2.4 ± 1.9 days in the intervention group and 2.3 ± 1.9 days in the control group). The most common reason for consultation was dysuria (Table 1).

Management of patients

A clinical examination was performed on 116 (98.3%) patients (Table 2). Diagnostic methods were used in 99 patients (Table 2). No antibiotic treatment was prescribed in 16 patients. The most frequently prescribed antibiotic was trimethoprim–sulphamethoxazole (Table 2).

Adherence to treatment guidelines

The first choice antibiotic was prescribed to 79 patients and did not differ significantly among the intervention and control groups. The correct time period of treatment was followed in 47 patients (33 in the intervention group and 14 in the control group; $p = 0.03$).

The adherence to guidelines was confirmed in 42 patients (32 in the intervention group and 10 in the control group; $p = 0.004$).

DISCUSSION

Discussion on methods

The current study was one of the first intervention studies performed in a sample of women with uncomplicated LUTIs in OOHC centres. The main strength of this study was the intervention and prospective design, which enabled us to directly assess the value of the intervention. The main limitation of the study was the short–term evaluation of the intervention effect; thus, we were not able to determine the long–term evaluation. Based on previous experiences, repeated interventions add to the sustainability of the intervention effect. Also, the Slovenian guidelines changed shortly before the start of this study, which might have had an effect on antibiotic prescribing and the validity of the results. Even though the sample was not large, significant differences were demonstrated between the intervention and control groups, and therefore we can be fairly confident in our results. The fact that the two groups of patients differed in terms of age could have also affected the results. A limitation of the study was the low response rate of the APHC centres and patients. This limitation could have contributed to a selection bias, thus the results of this study should be interpreted with care.

Table 1: *Clinical characteristics of patients*

Characteristic	N (%) of all patients	N (%) of patients in intervention group	N (%) of patients in control group	p
Dysuria	98 (83.1)	52 (81.3)	46 (86.8)	0.54
Polyuria	93 (78.8)	49 (76.6)	44 (88.0)	0.25
Abdominal pain	71 (60.2)	42 (65.6)	29 (56.9)	0.44
Lumbar pain	43 (36.4)	24 (38.1)	19 (35.8)	0.85
Malaise	39 (33.1)	17 (27.0)	22 (44.0)	0.07
Haematuria	38 (32.2)	18 (28.6)	20 (39.2)	0.35
Fever	23 (19.5)	12 (18.8)	33 (25.0)	0.48
Urinary incontinence	10 (8.5)	2 (3.1)	8 (16.0)	0.04
Urinary retention	2 (1.7)	1 (1.6)	1 (2.1)	0.67

Table 2: *Management of patients*

Variable	N (%) of all patients	N (%) of patients in intervention group	N (%) of patients in control group	P
Clinical examination performed	116 (98.3)	62 (96.9)	54 (100)	0.50
Diagnostic methods	99 (83.9)	59 (93.7)	40 (78.4)	0.03
Test strips	36 (30.5)	28 (44.4)	8 (15.7)	0.001
Urine analysis	43 (36.4)	20 (31.7)	23 (45.1)	0.17
Antibiotic treatment	102 (86.4)	60 (93.8)	42 (77.8)	0.02
Trimethoprim–sulphametoxazole	57 (48.3)	30 (47.6)	27 (58.7)	0.33
Nitrofurantoin	22 (18.6)	17 (27.0)	5 (10.9)	0.05
Fluoroquinolones	15 (12.7)	11 (15.6)	6 (13.0)	0.60
Other	5 (4.6)	2 (3.2)	3 (6.5)	0.65

Discussion on results

Our study showed that a simple intervention can significantly enhance adherence to treatment guidelines in patients with LUTIs managed in OOHC centres. The relative proportion of patients prescribed the correct drug of first choice according to Slovenian guidelines did not differ significantly between the intervention and control groups because a high percentage of the physicians in the control group were prescribing medication as recommended in the guidelines. However, when we further considered the correct duration of drug treatment duration, the adherence to guidelines was also more common in the intervention group which is in agreement with other studies (7, 20). According to a previous study on LUTIs in Slove-nian OOHC centres (10), the adherence to the correct time period of treatment is a problem because the doctors working in OOHC centres usually prescribe antibiotics for longer periods than necessary.

A similar study in Belgian OOHC centres showed that a simple, multifaceted intervention significantly reduced the relative proportion of appropriate antibiotic prescriptions (9). Several intervention studies involving the treatment of LUTI were conducted in nursing homes and showed some improvement and printed educational methods when used alone may have a beneficial effect on process outcomes (13, 15–16, 21). In contrast, no single intervention can be recommended for all behaviours in any setting (14, 22).

The correct first choice antibiotic was prescribed to nearly 80% of patients, which is more than in the cross–sectional study and a higher adherence when compared to other studies, where it ranged from 30% to 75% (1, 7, 10, 20). However, the wide range of prescribing prevalence points to the large differences among countries, and therefore the comparisons are difficult.

Our study, unlike many other studies, showed that a single–layer intervention can improve the adherence to clinical guidelines (13, 14, 16, 21). This is important because multifaceted interventions can be time–consuming and difficult to implement in practice. Simple intervention does not require much effort, staff, and time, and could be therefore used in many different settings. We cannot expect that such interventions could affect all causes for low adherence to drug prescription guidelines, as these are multifaceted and such interventions are directed only to the physicians (11). Such interventions could be useful for cheap and quick actions to improve guideline adherence. Still, we have to bear in mind that such improvement in guideline adherence might not be sustained in the long term (9).

Although we only found a marginal effect of our intervention, and because it appears that no single intervention can be recommended for all behaviours in any setting, the intervention with a poster with guidelines hung on the wall in the centre can be considered effective for OOHC settings (14). There are many physicians working in OOHC settings and their rotations are very frequent. Therefore, other methods of intervention might have a smaller effect. Further studies involving larger international samples are needed. The long–term effect of such interventions should also be evaluated.

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REFERENCES

1. Ong DSY, Kuyvenhoven MM, Van Dijk L, Verheij TJM. Antibiotics for respiratory, ear and urinary tract disorders and consistency among GPs. J Antimicrob Chemother. 2008; 62: 587–92.
2. Akkerman AE, Kuyvenhoven MM, van der Wouden JC, Verheij TJ. Determinants of antibiotic overprescribing in respiratory tract infections in general practice. J Antimicrob Chemother. 2005; 56(5): 930–6.
3. Lugtenberg M, Burgers JS, Zegers–van Schaick JM, Westert GP. Guidelines on uncomplicated urinary tract infections are difficult to follow: perceived barriers and suggested interventions. BMC Fam Pract. 2010; 11: 51. doi: 10.1186/1471-2296-11-51
4. Rautakorpi UM, Huikko S, Honkanen P, Klaukka T, Makela M, Palva E et al. The Antimicrobial Treatment Strategies (MIKSTRA) program: a 5–year follow–up of infection–specific antibiotic use in primary health care and the effect of implementation of treatment guidelines. Clin Infect Dis. 2006; 42(9): 1221–30.
5. Car J, Svab I, Kersnik J. Management of lower urinary tract infection in women by Slovene GPs. Fam Pract. 2003; 20: 452–6.
6. Goosens H, Ferech M, Vander Stichele R, Elseviers M. Outpatient antibiotic use in Europe and association with resistance: a cross–national database study. Lancet. 2005; 365: 579-87. PMID: 15708101

7. Grover ML, Bracamonte JD, Kanodia AK, Bryan MJ, Donahue SP, Warner AM et al. Assessing adherence to evidence–based guidelines for the diagnosis and management of uncomplicated urinary tract infection. Mayo Clin Proc. 2007; 82(2): 181–5.

8. Huibers LAMJ, Moth G, Bondevik GT, Kersnik J, Huber CA, Christensen MB et al. Diagnostic scope in out–of–hours primary care services in eight European countries: an observational study. BMC Fam Pract. 2011;12:30. doi: 10.1186/1471-2296-12-30

9. Willems L, Denckens P, Philips H, Henriquez R, Remmen R. Can we improve adherence to guidelines for the treatment of lower urinary tract infection? A simple, multifaceted intervention in out–of–hours services. J Antimicrob Chemother. 2012; 67: 2997–3000.

10. Taskovska M, Klemenc–Ketis Z, Kersnik J. Adherence to guidelines for treatment of uncomplicated lower urinary tract infections in primary care emergency department. Zdrav Var. 2013; 52: 1–8.

11. Lugtenberg M, Burgers JS, Besters CF, Han D, Westert GP. Perceived barriers to guideline adherence: a survey among general practitioners: a survey among general practitioners. BMC Fam Pract. 2011; 12: 98.

12. South M, Royle J, Starr M. A simple intervention to improve hospital antibiotic prescribing. Med J Aust. 2003; 178(5): 207–9.

13. Pettersson E, Vernby A, Mölstad S, Lundborg CS. Can a multifaceted educational intervention targeting both nurses and physicians change the prescribing of antibiotics to nursing home residents? A cluster randomized controlled trial. J Antimicrob Chemother. 2011; 66(11): 2659–66.

14. Arnold SR, Straus SE. Interventions to improve antibiotic prescribing practices in ambulatory care. Cochrane Database Syst Rev. 2005; 4: CD003539.

15. Farmer AP, Légaré F, Turcot L, Grimshaw J, Harvey E, McGowan JL et al. Printed educational materials: effects on professional practice and health care outcomes. Cochrane Database Syst Rev. 2008; 3: CD004398.

16. Loeb M, Brazil K, Lohfeld L, McGeer A, Simor A, Stevenson K et al. Effect of a multifaceted intervention on number of antimicrobial prescriptions for suspected urinary tract infections in residents of nursing homes: cluster randomised controlled trial. BMJ. 2005; 331(7518): 669. doi: 10.1136/bmj.38602.586343.55

17. Car J, Marinko T. Zdravljenje nezapletene okužbe sečnega mehurja pri ženskah v družinski medicini. Zdrav Vestn. 2003; 72: 79–83.

18. Čižman M, Beovič B, Sočan M. Rezistenca in raba antibiotikov: možnosti izboljšav njihove rabe v družinski medicini. Med Razgl. 2011; 50(Suppl 1): 13–9.

19. Huibers L, Giesen P, Wensing M, Grol R. Out–of–hours care in western countries: assessment of different organizational models. BMC Health Serv Res. 2009; 9: 105. doi: 10.1186/1472-6963-9-105

20. McEwen LN, Farjo R, Foxman B. Antibiotic prescribing for cystitis: how well does it match published guidelines? Ann Epidemiol. 2003; 13(6): 479–83.

21. Lundborg CS, Wahlström R, Oke T, Tomson G, Diwan VK. Influencing prescribing for urinary tract infection and asthma in primary care in Sweden: a randomized controlled trial of an interactive educational intervention. J Clin Epidemiol. 1999; 52(8): 801–12.

22. Flottorp S, Oxman AD, Håvelsrud K, Treweek S, Herrin J. Cluster randomised controlled trial of tailored interventions to improve the management of urinary tract infections in women and sore throat. BMJ. 2002; 325(7360): 367. PMCID: PMC117890