

Brief report

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Misconceptions of Spanish general practitioners' attitudes toward the management of urinary tract infections and asymptomatic bacteriuria: an internet-based questionnaire study

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ABSTRACT

Introduction. The diagnosis and management of urinary tract infections (UTI) vary widely across countries and practices. The objective of this study was to gain insight into general practitioners' (GP) perceptions on the current management of UTIs and asymptomatic bacteriuria in Spain.

Methods. Cross-sectional, internet-based questionnaire study answered from July to September 2013. GPs affiliated with the largest Spanish scientific society in primary care (*Sociedad Española de Medicina Familiar y Comunitaria*) were invited to participate in the study. They were asked about the tests ordered in both uncomplicated and complicated UTIs and about the management in three clinical scenarios, depicting a 50-year woman with: 1. An uncomplicated UTI, 2. A complicated UTI, and 3. An asymptomatic bacteriuria.

Results. The questionnaire was completed by 1,239 GPs (6.7%). Urine cultures were reportedly requested by 26.3% of the GPs in uncomplicated UTIs and by 71.8% of the cases corresponding to the complicated UTIs whereas it was declared that dipsticks were the preferred tests in only uncomplicated UTIs (38.2%). A total of 22% and 13.2% of the GPs stated that they would withhold antibiotic therapy in patients with low-count and high-count asymptomatic bacteriuria, respectively.

Conclusions. GPs have important misconceptions as to the indications for ordering urine cultures and in interpreting the definitions of common UTIs and treating UTIs and asymptomatic bacteriuria. The unnecessary use of antibiotics in patients with asymptomatic bacteriuria is considerable in Spain.

Keywords: Antibiotics, Asymptomatic bacteriuria, Urinary tract infections; Spain, Primary care.

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Ideas equivocadas de los médicos de atención primaria españoles en cuanto al manejo de las infecciones urinarias y bacteriuria asintomática: un estudio basado en un cuestionario online

RESUMEN

Introducción. Tanto el diagnóstico como el manejo de las infecciones del tracto urinario (ITU) varían entre países y consultas. El objetivo de estudio fue conocer las percepciones de los médicos de atención primaria en cuanto al manejo de las ITU y bacteriuria asintomática en España.

Métodos. Estudio transversal, basado en un cuestionario realizado online entre julio y septiembre de 2013. Se invitó a participar a los médicos de la sociedad científica más importante de atención primaria de España (*Sociedad Española de Medicina Familiar y Comunitaria*), a quienes se preguntó por las pruebas que solicitan en las ITU no complicada y complicada, así como el manejo en tres escenarios clínicos, que se basaban en una mujer de 50 años con 1. Una ITU no complicada, 2. Una ITU complicada y 3. Una bacteriuria asintomática.

Resultados. Contestaron el cuestionario 1.239 médicos (6,7%). Los médicos declararon pedir urocultivos en un 26,3% de las ITU no complicadas y en un 71,8% de los casos de ITU complicadas mientras que admitieron usar preferentemente tiras reactivas de orina en la ITU no complicada (38,2%). Un 22% y un 13,2% de los médicos admitieron no prescribir antibióticos en casos de bacteriuria asintomática de bajo recuento y de alto recuento, respectivamente.

Conclusiones. Los médicos de atención primaria tienen ideas equivocadas en cuanto a indicaciones de solicitar urocultivos, interpretar las distintas definiciones de las ITU más frecuentes y de tratar ITU y la bacteriuria asintomática. La utilización innecesaria de antibióticos en pacientes con bacteriuria asintomática es considerable en España.

Palabras clave: Antibióticos; Bacteriuria asintomática; Infección urinaria; España; Atención primaria.

INTRODUCTION

Urinary tract infections (UTIs) are the most common type of bacterial infection in Western countries. General practitioners (GPs) are frequently faced with making this common diagnosis. Nearly 40% of women report having had at least one UTI in their lifetime, with more than 10% reporting at least one episode and about 3% reporting recurrent UTI (three or more episodes) in the past year^{1,2}. Almost all women consult a health professional when they have symptoms attributable to a UTI, and about three quarters of these have some form of urine test and are prescribed an antibiotic for their symptoms². However, when routine urine culture is performed up to 60% of women with symptoms attributable to UTI are found not to have a microbiologically confirmed UTI³⁻⁵.

The tests ordered and the management of UTIs and asymptomatic bacteriuria vary among countries⁶, but this variation that is not warranted on clinical grounds could waste resources, put patients at unnecessary risk of adverse events, and unnecessarily drive antimicrobial resistance, a growing international problem that does not respect national borders. Antimicrobial stewardship interventions and clinical practice guidelines would therefore be enhanced by a better understanding of the variation in care and its association with microbiological findings. We therefore aimed to describe which tests GPs usually order in two clinical scenarios and analyse the management of uncomplicated and complicated UTIs and asymptomatic bacteriuria by means an Internet-based questionnaire survey.

METHODS

A cross-sectional survey among a sample of Spanish GPs was conducted in 2013, using an internet-based survey (Appendix). The questionnaire was designed by a Spanish panel of GPs. A total of eight questions were developed regarding the tests ordered for confirming an UTI and the management of three different cases with bacteriuria. GPs were also asked to state how they would manage a 50-year woman with a symptomatic uncomplicated UTI, a symptomatic complicated UTI and an asymptomatic bacteriuria. The inquiry was available online in the *Sociedad Española de Medicina de Familia y Comunitaria* (SemFYC; www.semfyc.es; with about 18,600 members) website from July to September. The internet-based questionnaire software required respondents to answer a question before being able to continue to the next question. They were able to answer the questionnaire only once. Descriptive analyses were carried out.

RESULTS AND DISCUSSION

A total of 1,239 GPs completed the questionnaire (6.7%). It was declared that dipsticks were the preferred test in the uncomplicated UTIs (38.2%), but they would be ordered by 283 GPs in a complicated UTI (22.8%). Urine cultures were requested by 326 GPs in an uncomplicated UTI (26.3%) and by

890 GPs in the second scenario depicting a complicated UTI (71.8%). The remaining respondents (440 [35.5%] and 66 GPs [5.3%], respectively) believed that treatment should be prescribed without ordering any test.

The answers of the questions related to the therapy that would be prescribed in the 3 scenarios are shown in table 1. Monodose of fosfomycin was the first choice for patients with asymptomatic bacteriuria whereas short- and long-courses of antibiotics were the preferred choices in the case of an uncomplicated UTI and a complicated UTI, respectively. Only 22% of the GPs answering the questionnaire stated that they would withhold antibiotic therapy with low-count asymptomatic bacteriuria while 13.2% declared that they would not treat a high-count asymptomatic bacteriuria.

These data reveal important misconceptions that GPs have about the appropriate request of urine cultures and the management of UTIs and asymptomatic bacteriuria, despite being members of the largest scientific society of general practice in Spain. More than one fourth of GPs stated that they would order urine cultures in the first scenario, depicting a patient with an uncomplicated UTI, while only slightly more than two thirds would do the same in a patient with a complicated UTI with more than 3 UTI episodes in the previous year. The low percentage of GPs withholding antibiotic therapy for asymptomatic bacteriuria is also worrisome since at least 78% stated that they would prescribe antibiotics even in low-count bacteriuria for asymptomatic women.

This survey-based study has several limitations. This was a study of opinions and perceptions which do not necessarily reflect the real management and prescription habits. Physicians tend to underestimate the percentages of cases in which an antibiotic is given⁷. As in other studies of opinions the results obtained do not accurately reflect what is in fact prescribed in primary care offices, but rather correspond to hypothetical scenarios in which GPs were simply asked to give their opinion about each specific situation. Conducting online surveys with GPs has several benefits, thereby making the web-based approach an attractive alternative to postal or telephone methods as they are easy to implement and allow large-scale surveys without postage costs⁸. However, the major drawback is external validity, and specifically how to obtain a representative sample and adequate response rate⁹. As acknowledged in other studies, respondents to electronic surveys are usually unrepresentative of the whole community of health professionals even within a certain specialty such as primary care. One cannot assume that registered members of a specific web site will necessarily reflect the whole group of these health professionals. In addition, demographic data were not requested in this questionnaire, and therefore information about age and gender of the respondents is lacking. However, the questionnaire allowed the GPs to answer only once. In addition, a pilot study in a primary healthcare centre was conducted before the main study in order to check that GPs understood the meaning of the questions clearly and that could be completed in less than ten minutes. Despite these weaknesses, this manuscript provides some insights about how GPs manage the

		5,000 CFU/ml <i>Escherichia coli</i>	>100,000 CFU/ml <i>Escherichia coli</i>
Uncomplicated urinary tract infection	Monodose	519 (42.0)	287 (23.2)
	Short-course antibiotic	628 (50.9)	886 (71.7)
	Long-course antibiotic	25 (2.0)	63 (5.1)
	No treatment	62 (5.0)	0 (-)
	Delayed prescribing of antibiotics	1 (0.1)	0 (-)
	Total	1,235	1,236
Complicated urinary tract infection	Monodose	5 (0.4)	3 (0.2)
	Short-course antibiotic	364 (29.5)	259 (21.0)
	Long-course antibiotic	865 (70.1)	974 (78.8)
	No treatment	0 (-)	0 (-)
	Delayed prescribing of antibiotics	0 (-)	0 (-)
	Total	1,234	1,236
Asymptomatic bacteriuria	Monodose	699 (56.5)	560 (45.2)
	Short-course antibiotic	217 (17.5)	439 (35.5)
	Long-course antibiotic	50 (4.0)	76 (6.1)
	No treatment	272 (22.0)	163 (13.2)
	Delayed prescribing of antibiotics	0 (-)	0 (-)
	Total	1,238	1,238

CFU=colony forming unit; ml: millilitre.

treatment of UTI and asymptomatic bacteriuria with the use of clinical scenarios.

Similar to physician behaviour seen in prior studies, GPs were not judicious in ordering urine dipstick analyses or urine cultures¹⁰⁻¹². Many dipstick tests were ordered for patients who, based on history and examination, already had a 90% probability of UTI¹³. The current recommendations are very clear. In the absence of risk factors of complicated UTI and in cases with clear clinical manifestations of cystitis (two or more symptoms) and in the absence of vaginal symptoms, empiric treatment may be started without the need for another laboratory test¹³. Nonetheless, despite the high probability of infection shown by positive results on urine dipstick testing, GPs frequently ordered urine cultures. In cases of uncomplicated lower UTI, these tests should not be requested because of their cost, time and effort and the results of urine cultures do not imply a change in the treatment implemented. However, in our study only one third of the responding GPs followed these guidelines. The participating GPs may have doubted about the safety of not treating infections with antibiotics. Given the high rates of resistance of the urinary pathogens in Spain, results of urine culture with analysis of the susceptibility could have assured the practitioners as to the appropriateness of the antibiotic. Another reason why primary care physicians requested unnecessary urine cultures was probably to avoid the

possibility of new relapses, although this attitude is not logical in cases of uncomplicated infection. GPs should remember the criteria for requesting a urine culture – relapse, symptoms of cystitis with a negative dipstick test, a history with suspicion of potentially complicated subclinical pyelonephritis, such as lithiasis, functional or structural urinary tract alterations, UTI during childhood, diabetes or pyelonephritis within the last year or frequent recurrence (>3/year) – as shown in the second scenario. However, urine culture was only requested by less than only 71.8% of the cases for complicated UTI in our survey.

Another result of note in this study was the huge number of GPs who stated that they would prescribe an antibiotic for asymptomatic bacteriuria, even in cases with low-count bacteriuria. As defined by the European Association of Urology, asymptomatic bacteriuria is a subject without urinary tract symptoms with a mid-stream urine sample showing bacterial growth $\geq 10^5$ colony forming units (CFU) per ml of urine in two consecutive samples in women, and in a single sample in men¹⁴. However, nearly 90% of the GPs in our survey would have prescribed an antibiotic for asymptomatic bacteriuria in the 50-year woman with only one positive urine culture result and nearly 80% would have done so in a case of low-count bacteriuria which fails to meet the definition of asymptomatic bacteriuria. Similar to what occurred in the diagnosis, the GPs who answered the questionnaire were probably doubtful as to

the use of short-course regimens, mainly single doses, for fear of relapse, and this was clearly stated in this study, since short-course regimens were preferred in cases of uncomplicated UTIs and long courses were selected in cases of complicated UTIs¹⁵.

In conclusion, in this study primary care physicians demonstrate poor adherence to the current recommendations for the diagnosis and management of UTIs and asymptomatic bacteriuria. Adherence to clinical practice guidelines would undoubtedly aid GPs in carrying out a more rational use of antibiotics in these infections. McIsaac et al reported that adherence to guidelines would represent a reduction in unnecessary antibiotic prescription and avoid 59% of the urine cultures requested¹⁶. Butler et al described how a reduction in antibiotic prescription carries a parallel decrease in resistance, in this case, with ampicillin¹⁷. When it comes to asymptomatic bacteriuria there is now solid evidence that antimicrobial therapy should only be indicated in pregnant patients and those undergoing genitourinary procedures in which mucosal bleeding is expected. Outside these patient populations, treatment confers no benefit. We consider that a method of bypassing these difficult-to-change GP behaviours is by intervening at the stage of laboratory reporting. Ideally, an intervention to decrease the ordering of urine cultures without indication would prevent the detection and subsequent treatment of asymptomatic bacteriuria, as has been recently shown in a hospital-based study¹⁸. Once urine culture results are reported, GPs find it difficult to ignore and reflexively result in the prescription of antimicrobial therapy, even for patients with a low suspicion of UTI. Schulz et al reported the top ten myths regarding the diagnosis and treatment of UTIs¹⁹. According to our study, these myths are still strongly ingrained among Spanish GPs. The increasing rates of resistance, cross-resistance and multiresistance shown by urinary pathogens are a severe problem, which should be palliated with the rational choice of antibiotics when they are strictly needed.

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Appendix

Questionnaire used in this survey (translated into English)

Question 1. A 50-year old woman sees you with symptoms of dysuria, urgency and frequency and the examination reveals cystitis. She had another urinary tract infection one year earlier. What test would you order to confirm this diagnosis?

- a) Dipstick
- b) Urine culture
- c) None and treat immediately

Question 2. Imagine you ordered a urine culture and the result is positive showing a count of 5,000 CFU/ml *Escherichia coli*, which is susceptible to all the antibiotics tested. What treatment would you prescribe?

- a) Monodose (fosfomicin)
- b) Short-course antibiotics (2-5 days) – including 2-day fosfomicin, 3-day quinolones, 5-day β -lactam therapy, 5-day nitrofurantoin courses –
- c) Long-course antibiotics (at least 7 days)
- d) No treatment
- e) Delayed antibiotic prescription

Question 3. Imagine the same scenario but the result shows >100,000 CFU/ml. What treatment would you prescribe?

- a) Monodose
- b) Short-course antibiotics (2-5 days)
- c) Long-course antibiotics (at least 7 days)
- d) No treatment
- e) Delayed antibiotic prescription

Question 4. A 50-year old woman sees you with symptoms of dysuria, urgency and frequency and the examination reveals cystitis. This is the fourth urinary tract infection in less than one year. What test would you order to confirm this diagnosis?

- a) Dipstick
- b) Urine culture
- c) None and treat immediately

Question 5. Imagine you ordered a urine culture and the result is positive showing a count of 5,000 CFU/ml *Escherichia coli*, which is susceptible to all the antibiotics tested. What treatment would you prescribe?

- a) Monodose
- b) Short-course antibiotics (2-5 days)
- c) Long-course antibiotics (at least 7 days)
- d) No treatment
- e) Delayed antibiotic prescription

Appendix

Question 6. Imagine the same scenario as in the previous case, but the result shows >100,000 CFU/ml. What treatment would you prescribe?

- a) Monodose
- b) Short-course antibiotics (2-5 days)
- c) Long-course antibiotics (at least 7 days)
- d) No treatment
- a) Delayed antibiotic prescription

Question 7. A 50-year old woman sees you with the results of a urine culture. She is now asymptomatic but the urine culture is positive showing a count of 5,000 CFU/ml *Escherichia coli*, which is susceptible to all the antibiotics tested. What treatment would you prescribe?

- a) Monodose
- b) Short-course antibiotics (2-5 days)
- c) Long-course antibiotics (at least 7 days)
- d) No treatment
- e) Delayed antibiotic prescription

Question 8. The same scenario as in the previous case but the count is now >100,000 CFU/ml. What treatment would you prescribe?

- a) Monodose
- b) Short-course antibiotics (2-5 days)
- c) Long-course antibiotics (at least 7 days)
- d) No treatment
- e) Delayed antibiotic prescription