

The use of amoxicillin and clavulanic acid and quinolones as first choice antibiotics in uncomplicated urinary tract infections in Spain should be reviewed

Debería revisarse la utilización de amoxicilina y ácido clavulánico y quinolonas como antibióticos de primera elección en las infecciones no complicadas del tracto urinario

Urinary tract infections (UTI) represent a common problem in primary care consultations.¹ Uncomplicated community-acquired cystitis is caused by *Escherichia coli* in approximately 90% of cases.² The current management of acute uncomplicated cystitis is usually empirical, with neither urine cultures or susceptibility testing being used to guide therapy. Thus, empirical treatment in UTIs should cover *E. coli*. Resistance of this bacterium to amoxicillin and clavulanic acid and quinolones, albeit variable, is increasing in Spain and may lead to clinical failure.³ The aim of this study was to evaluate the non-susceptibility of *Escherichia coli* to five commonly prescribed antibiotics in 2006 and 2009. A retrospective analysis of susceptibility towards five antimicrobial agents (amoxicillin and clavulanic acid, cefuroxime, third generation cephalosporins – expressed as percentage of extended-spectrum β -lactamases – ciprofloxacin, trimethoprim and sulfamethoxazole, and fosfomycin) among *E. coli* strains was carried out in urine cultures requested in 2006 and 2009 by primary care physicians, microbiologists and doctors working in the hospital setting. The susceptibility to these antibiotics was determined using automatic microdilution systems – Microscan (Baxter), Wider (Soria-Melguizo), Vitek (Bio-Mérieux) and Phoenix (Becton-Dickinson) and/or disc-plates. The participating centres were the Hospital of Basurto (Bilbao), Bon Pastor laboratory (Barcelona), Hospital of Donostia (San Sebastián),

Instituto Navarro de Salud (Pamplona), Hospital Puerta de Hierro (Madrid), Hospital General de Segovia (Segovia), Hospital Virgen de la Macarena (Sevilla), Hospital Royo Villanova (Zaragoza). Urine cultures were heterogeneous, despite most being from the community setting (mainly young women with uncomplicated cystitis). Only in Hospital Royo Villanova, more than half of the cultures corresponded to complicated UTIs in elderly men. In the Bon Pastor laboratory, however, all the urine cultures were requested by primary care physicians and the data from 2010 are presented instead of those of 2009. A descriptive analysis was carried out with the global results of the susceptibility testing.

As shown in Table 1 the rates of non-susceptibility of *E. coli* to amoxicillin and clavulanic acid increased in nearly all the centres analysed from 2006 to 2009, with percentages ranging from 8.7% to 29% in the latter year. Resistance to ciprofloxacin has also increased, with rates ranging from 23.4% to 42.9% in 2009. Over the two years analysed the rates of resistance to fosfomycin also increased but currently account for less than 5% of all the *E. coli* strains. In the Bon Pastor laboratory fosfomycin, third-generation cephalosporins and nitrofurantoin showed the lowest resistance rates for the *E. coli* isolates with percentages lower than 10%.

The most important limitation of this study is the heterogeneity of the urine cultures analysed. Even though most cultures were requested by family physicians, some were also ordered in the hospital setting. Another issue is the type of UTI. Despite requests for urine cultures only being recommended in cases of recurrent and complicated UTIs, cultures are also often requested in many cases corresponding to uncomplicated UTIs.⁴ Another limitation is that the urine cultures were not matched with the characteristics of the patients, such as age and comorbidity. We attempted to only report raw data in the present study. Even though the results of antimicrobial susceptibility testing are not always related to the clinical outcome, since bacterial resistance has been shown to overestimate the risk of therapeutic failure in UTI,⁵

Table 1 Non-susceptibility rates of *Escherichia coli* towards five common antibiotics in 2006 and 2009 in eight different laboratories in Spain.

Antibiotic	Year	BB	BP ^a	DO	PH	PA	SG	VM	RV
Amoxicillin and clavulanic acid	2006	20.8	17.6	9.3	8.8	10.0	14.0	6.8	1.8
	2009	20.2	29.0	8.7	21.7	12.0	22.0	21.4	12.2
Ciprofloxacin	2006	26.1	25.6	22.4	20.2	19.2	27.0	40.7	40.4
	2009	28.2	27.0	23.4	27.8	24.4	30.0	41.7	42.9
Cefuroxime	2006	8.7	19.2	8.6	2.9	NA	9.0	12.0	10.2
	2009	11.1	13.0	11.2	9.0	NA	12.0	11.3	12.5
Trimethoprim and sulfamethoxazole	2006	NA	29.6	26.8	30.1	26.6	36.0	NA	NA
	2009	NA	34.0	27.8	34.1	25.3	33.0	NA	NA
Fosfomycin	2006	5.7	NA	1.7	2.8	NA	4.0	1.1	4.0
	2009	9.5	3.0	2.8	3.3	NA	4.0	1.1	9.5
Third generation cephalosporins	2006	3.3	2.0	4.0	1.0	2.9	5.0	10.0	4.0
	2009	6.2	4.0	6.8	7.6	3.9	5.0	7.0	6.0

B: Basurto, Bilbao; BP: Bon Pastor, Barcelona; DO: Donostia, San Sebastián; PH: Puerta de Hierro, Madrid; PA: Pamplona; SG: Segovia; VM: Virgen de la Macarena, Sevilla; RV: Royo Villanova, Zaragoza; NA: not available.

^a Data from 2006 and 2010.

these updated resistance rates against amoxicillin and clavulanic acid and quinolones should be taken into account by general practitioners. According to the recommendations of the Infectious Diseases Society of America and the study by Guay, the antibiotic should be substituted when the rates of resistance surpass 20%.⁶ Taking the microbiological data into account neither of these antibiotics should continue to be recommended as first choice for empirical treatment of uncomplicated UTIs in Spain.

Conflicts of interest

No conflicts declared. The results have partially been presented in the meetings of the Sociedad de Enfermedades Infecciosas del Norte (SEINORTE) held in Santander and the Grupo de Estudio de la Infección en Atención Primaria de la Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica (GEIAP-SEIMC) held in Zaragoza, both carried out in 2011.

Acknowledgements

The authors wish to acknowledge the contribution of the following principal investigators to this study in each centre: M. Gomáriz (microbiology unit at Hospital of Donostia, San Sebastián), R. Martínez-Álvarez (internal medicine unit at Unidad de enfermedades Infecciosas, Hospital Royo Villanova, Zaragoza), P. Carrero (microbiology unit at Hospital General of Segovia), J. Oteo (Laboratorio de Antibióticos, Centro Nacional de Microbiología at Instituto Carlos III, Majadahonda, Madrid), M.J. Aldea (microbiology unit, Hospital Royo Villanova, Zaragoza), B. Orden (microbiology unit at Hospital Puerta de Hierro, Madrid), A. Gil-Setas (microbiology unit at Instituto Navarro de Salud in Pamplona), J.L. Díaz de Tuesta (microbiology unit at Hospital of Basurto, Bilbao), and L. López (microbiology unit at Hospital Virgen de la Macarena, Sevilla).

Bibliografía

1. Hooton TM, Besser R, Foxman B, Fritsche TR, Nicolle LE. Acute uncomplicated cystitis in an era of increasing antibiotic resistance: a proposed approach to empirical therapy. *Clin Infect Dis*. 2004;39:75–80.
2. Andreu A, Planells I, Grupo cooperativo español para el estudio de la sensibilidad antimicrobiana de los patógenos urinarios. Etiología de la infección urinaria baja adquirida en la comunidad y resistencia de *Escherichia coli* a los antimicrobianos de primera línea, Estudio nacional multicéntrico. *Med Clin (Barc)*. 2008;130:481–6.
3. Oteo J, Campos J, Lázaro E, Cuevas Ó, García-Cobos S, Pérez-Vázquez M, et al. Increased amoxicillin-clavulanic acid resistance in *Escherichia coli* blood isolates, Spain. *Emerg Infect Dis*. 2008;14:1259–62.
4. Llor C, Rabanque G, López A, Cots JM. The adherence of general practitioners to guidelines for the diagnosis and treatment of lower urinary tract infections in women is poor. *Fam Pract*. 2011;28:294–9.
5. Vallano A, Rodríguez D, Barceló E, López A, Cano Á, Viñado B, et al. Sensibilidad antimicrobiana de los uropatógenos y resultados del tratamiento antibiótico de las infecciones urinarias en atención primaria. *Enferm Infecc Microbiol Clin*. 2006;24:418–25.
6. Guay DR. Contemporary management of uncomplicated urinary tract infections. *Drugs*. 2008;68:1169–205.

Carles Llor^{a,*}, Carmen Aspiroz^b, Ángel Cano^c,
Margarita Barranco^d

^a Centro de Atención Primaria Jaume I, Tarragona,
University Rovira i Virgili, Spain

^b Unidad de Microbiología, Hospital Royo Villanova,
Zaragoza, Spain

^c Centro de Atención Primaria Bon Pastor, Barcelona, Spain

^d Laboratori Bon Pastor, Barcelona, Spain

* Corresponding author.

E-mail address: carles.llor@urv.cat (C. Llor).

doi:10.1016/j.aprim.2011.11.005

Mapa de errores de medicación y seguridad del paciente

Medication errors map and patient safety

Sr. Director:

Tras la lectura del trabajo de Taravilla et al.¹ en el que se describe la elaboración de un mapa de errores de medicación de ámbito extrahospitalario, queremos hacer varias observaciones. En primer lugar, nos gustaría felicitar a las autoras por la orientación práctica de su trabajo, que analiza modos de fallo en el proceso de utilización de medicamentos de su ámbito y propone medidas correctoras concretas.

El estudio sobre la seguridad de los pacientes en atención primaria de salud (APEAS) mostró una prevalencia de sucesos adversos del 18,63% (7,45% incidentes y 11,18% efectos

adversos). La medicación fue factor causal del 48,2% de los efectos adversos (EA), no del total de sucesos adversos² como indican las autoras. El porcentaje de EA por medicación en hospitalización es inferior (37,4% según el estudio ENEAS)³. El estudio APEAS también mostró el origen de los EA por medicamentos (centro de salud 85%, atención especializada 14,2% y farmacia 0,8%), su severidad (leves 64,3%, moderados 30%, graves 5,7%) y lo más importante, que el 59,1% son evitables (66,1% de los moderados y graves)². En hospitalizados solo el 34,8% de los EA por medicación son evitables³. Para aproximarnos a la relevancia real de estas cifras, dado que en los centros de atención primaria del Sistema Nacional de Salud en el año 2009 fueron atendidos 28.438.666 usuarios (incluidas las consultas de medicina de familia y comunitaria, pediatría y enfermería)⁴, podemos inferir que 153.249 pacientes podrían haber sufrido un EA relacionado con la medicación ese año, de los que 90.557 hubieran sido evitables.