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Risk factors for antimicrobial-resistant *Neisseria gonorrhoeae* and characteristics of patients infected with gonorrhea☆

Factores de riesgo asociados a la infección por Neisseria gonorrhoeae *resistente a antimicrobianos y características de los pacientes con infección gonocócica*

Dear Editor,

We have read with interest the abridged original entitled "Risk factors for antimicrobial-resistant *Neisseria gonorrhoeae* infection and characteristics of patients with gonococcal infection" published by Fuertes de Vega et al.[1] This paper studies the antimicrobial susceptibility of 110 isolated *N. gonorrhoeae* strains from patients treated in a sexually transmitted infections unit in Barcelona and attempts to establish a relationship between the epidemiological and behavioural characteristics of patients and the development of antimicrobial resistance. In our opinion, this study provides very relevant data, both regarding the antimicrobial susceptibility of the strains studied and the different risk factors for the development of resistance. Even so, we would like to make some comments.

The authors study susceptibility to penicillin, cefotaxime, cefixime, ciprofloxacin, azithromycin, spectinomycin and gentamicin, using Etest®, following the recommendations and cut-off points of the European Committee on Antimicrobial Susceptibility Testing (EUCAST). A very surprising fact is that they found a percentage of resistance to cefotaxime of 9.1%, a value much higher than that documented by the European Centre for Disease Prevention and Control,[2] which, in 2013, only detected seven isolates resistant to ceftriaxone out of the 1932 studied (0.4%) and, in 2014, there were five resistant out of 2015 (0.2%). Our group, since 2012, has also been monitoring the susceptibility of all isolates of *N. gonorrhoeae* from patients treated at the Vall d'Hebron-Drassanes Sexually Transmitted Infections Unit (UITS-VH-Drassanes), at the Vall d'Hebron Hospital and in the 150 primary care centres attached to it. From August 2012 to December 2017, 2181 isolates from 2021 patients were studied. 51% of the strains showed resistance to ciprofloxacin, 4.1% to azithromycin and 15.4% were resistant to penicillin due to production of a beta-lactamase. These values are similar to those obtained by Fuertes de Vega et al.[1] In contrast, only 0.7% of the strains showed decreased susceptibility to ceftriaxone and 4.6% to cefixime, values more similar to those observed by the European Centre for Disease Prevention and Control (ECDC). We believe that one of the reasons for the overestimation of the percentage of resistance to these latter antimicrobials in the study by Fuertes de Vega et al.,[1] as the authors themselves point out, could be the limited number of isolates included in the study.

On the other hand, the authors compare their results with those obtained by Cole et al.[3] and with the Epidemiological Report of the Integrated Epidemiological Surveillance System of AIDS/HIV/STIs in Catalonia,[4] the first of which includes all the isolates sent between 2009 and 2011 to the European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP) from 21 European countries, and the second includes all the cases reported in Catalonia in 2014. We think that the type of user treated in a specialist STI unit like theirs could be an important bias when extrapolating the results to the general population.

Another very interesting aspect of the aforementioned study is the association found between heterosexual patients and strains with resistance to certain antimicrobials. In this context, in a study published by our team,[5] a statistically significant relationship was found between the NG-MAST genogroup 1407 and the strains with decreased susceptibility to third-generation cephalosporins. In a second study by the same group[6] a significantly higher percentage of resistance to cephalosporins and ciprofloxacin was found in heterosexual patients, who were more frequently infected with the aforementioned genogroup (G1407). Therefore, our results are consistent with those observed by Fuertes de Vega et al.[1] and by Cole et al.[3]

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