



Antimicrobial susceptibility of *Neisseria gonorrhoeae* in Catalonia: A four-year study.

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P0358



Neisseria gonorrhoeae is the etiological agent of gonorrhoea, a sexually transmitted infection that has important public health implications. Over time this species has developed decreased susceptibility or resistance to the antimicrobials used. In this context, knowledge on the epidemiology of gonococcal resistance at a regional level is essential.

Objective

To determine the antimicrobial susceptibility of *N. gonorrhoeae* isolates in our geographical area (El Vallès Occidental, Catalonia).

Methods

A total of 44,313 clinical specimens were sent to our institution for study of sexually-transmitted infection (STI) from September 2010 to September 2014. CatLab is a referral laboratory covering an area nearby Barcelona with ca. 850,000 inhabitants. The isolates grown on chocolate or Thayer Martin plates were identified as *N. gonorrhoeae* by APINH and VITEK NH (bioMérieux, France). Confirmation was performed by PCR STD Dx CT/NG/MG Assay (BIO-RAD). Susceptibility testing was performed using Etest (bioMérieux, France) on BBL GC II Agar IsoVitalex (Becton-Dickinson, USA). The European Committee on Antimicrobial Susceptibility Testing (EUCAST) breakpoints were used.

Results

During the period under study, 310 isolates of *N. gonorrhoeae* were recovered. The positive clinical specimens were mainly urethral swabs (n=239), followed by vaginal/endocervical swabs (n=38); the remaining positive specimens included semen, pharyngeal and rectal exsudates. Antibiotic susceptibility of the isolates is shown in figure 1. Of the total of isolates, 176 (56.8%) resistant to penicillin and 111 (35.8%) were intermediate. Resistance to cefotaxime was detected in 61 isolates (19.6%). Decreased susceptibility to ceftriaxone (MIC 0.19 mg/L) was present in two cefotaxime-resistant isolates (fig.2). The remaining isolates were susceptible to ceftriaxone although in 28.2% of them the MIC was *above* the epidemiological cut-off (0.032 mg/L) according to EUCAST. Resistance to azitromycin and ciprofloxacin was detected in isolates 37 (11,9%) and 204 (65,8%), respectively. All isolates were susceptible to spectinomycin.

Fig 1. Antimicrobial susceptibility of the *N.gonorrhoeae* isolates (n=310)

Antimicrobial	MIC50 (mg/L)	MIC90 (mg/L)	MIC range (mg/L)	Resistant (%)
Penicillin	2	>32	0.008->32	56,8
Cefotaxime	0.06	0.38	<0.016-1.5	19,6
Ceftriaxone	0.023	0.094	≤0.002-0.19	0
Ciprofloxacin	8	>32	≤0.002->32	65,8
Azitromycin	0.16	1.5	0.012-48	11,9
Doxycyclin	1.5	16	0.06-32	43
Spectinomycin	16	32	6.0-32	0

MIC50, minimum inhibitory concentration of 50% of isolates; MIC90, minimum inhibitory concentration of 90% of isolates.

Fig 2. Antimicrobial susceptibility pattern of the two isolates with decreased susceptibility to ceftriaxone.

Clinical specimen	P* mg/L	CFT* mg/L	CTX* mg/L	CIP* mg/L	AZT* mg/L	SPE* mg/L	DOX*
pharyngeal [♀]	2	0.75	0.19	0.06	4	16	1
vaginal	2	1	0.19	>32	0.25	24	2

P:penicilin; CFT: cefotaxime; CTX:ceftriaxone; CIP:ciprofloxacin; AZT:azitromycin; SPE:spectinomycin; DXC:doxycyclin

Conclusion

- * We found two isolates with decreased susceptibility to ceftriaxone.
- * Of all the ceftriaxone-susceptible isolates, 28,2% had MICs above the epidemiological cut-off.
- * High rates of resistance to ciprofloxacin were detected.
- * Surveillance of gonococcal antimicrobial resistance is crucial to alert on epidemiological changes