Characteristics of N. gonorrhoeae Infection in MSM: Culture Is Key but Limited Sensitivity?

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Cristina Gómez-Ayerbe[1,2], Rosario Palacios[1,2], Salvador Martín-Cortés[1,2], María López-Jódar[2], Isabel Pérez-Hernández[1,2], Marina Villalobos[2], M. Victoria García[3], Jesús Santos[1,2] .
1. Infectious Diseases Unit, Hospital Virgen de la Victoria, Málaga (Spain); 2. IBIMA-Plataforma BIONAND, Málaga (Spain); 3. Microbiology, Hospital Virgen de la Victoria, Málaga (Spain).

BACKGROUND

- ***Neisseria gonorrhoeae*** (NG) is the most common sexual transmission infection (STI) in **MSM**, and remains a major public health concern worldwide.
- In this population, NG frequently presents as **asymptomatic** or extragenital infection, particularly at the pharyngeal and rectal sites, contributing to **ongoing transmission**.
- Nucleic acid amplification tests (NAATs), including PCR-based assays, are currently the most widely used diagnostic tools due to their high sensitivity, ease of use, and suitability for extragenital screening.
- Culture-based diagnosis remains essential for antimicrobial resistance surveillance, yet its use has declined due to technical complexity and lower sensitivity, especially in asymptomatic infections.
- **The objective of our study is to analyze clinical and microbiological characteristics of NG infections in a cohort of MSM.**

METHODS

- We analyzed all **NG infections** in **MSM** (on PrEP or PLHIV) at risk of STIs undergoing regular STI screening at our **Unit** (Hospital Virgen de la Victoria), from **October 2023 to September 2025**.
- STI screenings were performed every 3-6 months by **two samples** (one for culture and one for PCR assay) from each site: **pharyngeal**, **rectal**, **urethral/urine**.
- Diagnosis was made by positive PCR assay, and cases **without culture were excluded**.
- Samples were transported to the Microbiology Service in Amies transport medium (Deltalab©) and inoculated onto Martin-Lewis agar (Biomerieux®). NG identification was performed using the Malditof system.
- Susceptibility testing of isolates was carried out using E-test strips following EUCAST recommendations.
- Real-time PCR was also performed using the automated Cobas 4800system (Roche© NG/CT).
- Epidemiological and clinical data were collected and analyzed with Statistical program jamovi.

Most ***N. gonorrhoeae*** in MSM are **asymptomatic** and culture sensitivity is low in this context.
The **transmissibility** of a positive **PCR assay** should be deeply **investigated.**

RESULTS

Among the **617** NG infections with **positive PCR assay**, **cultures were performed in 605** (98,0%) episodes. Epidemiological and clinical characteristics of this population of MSM with NG infection are shown in table 1. Most MSM were on PrEP, 132 PLHIV on risk for STI, and 6 MSM without PrEP.

Cultures were **positive** in **159** samples (26.2%). Distribution of positive culture by site is shown in table 2.

In **124** episodes, subjects were on doxycycline post-exposure prophylaxis (**Doxy-PEP**).
This population on Doxy-PEP had **fewer concurrent STIs** (8.06 vs 15.5%, p<0.03), as shown in table 3.

Positive cultures were not associated with symptoms, HIV infection, or concurrent STIs.

However, **symptoms** were associated with **concurrent STIs** (23.5 vs 11.9% p<0,004).

Antimicrobial resistance is shown in table 4. All isolates were **sensitive to ceftriaxone**, and 61.0% resistance to tetracycline, higher in the Doxy-PEP users.

No seroconversions for HIV occurred in subjects on PrEP during this period.

Table 1: Characteristics of population with NG

	N (%)
On PrEP	467 (77.2)
PLHIV	132 (21.8)
Age (mean ± SD)	37.8 (± 9.9)
Culture +	**159 (26.8)**
Asymptomatic	**525 (86.7)**
Concurrent STI	**85 (14)**
- CT	60 (70)
- Syphilis	17 (20)
Previous NG infection	314 (51.6)

Table 2: Distribution by site

	Culture +	PCR+
- Rectal	**139** (34.3)	405
- Pharyngeal	2 (1.2)	155
- Urethral/urine	**18** (52.9)	34

Anova test: p<0.001

Table 4: Antimicrobial resistance due to Doxy-PEP use

	Doxy-PEP	No Doxy-PEP	p
Ceftriaxone S	**42 (100)**	**112 (100)**	
Tetracicline R	31/42 (73,8)	63/112 (56,2)	0.047

CONCLUSIONS

- **Most NG infections in MSM are asymptomatic**.
- In this context, culture sensitivity is low, with **higher recovery rates in rectal and urethral samples**.
- All isolates are **sensitive to ceftriaxone** and almost half to tetracyclines.
- People on **Doxy-PEP** have **fewer concomitant STIs.**
- The **transmissibility of a positive PCR assay** but **negative-culture**, especially pharyngeal, should be **deeply investigated**.

KEY KNOWLEDGE GAPS AND RESERCH QUESTIONS

- *The role of the pharynx as a critical reservoir for the dissemination of antimicrobial-resistant NG.*
- *The influence of rectal and pharyngeal microbiota on acquisition and persistence of infection.*
- *The long-term impact of PrEP use on the epidemiology of NG.*
- *Routine risk-based screening versus symptom-based testing for NG among MSM.*
- *The impact of extragenital self-sampling on NG incidence.*
- *Transmission dynamics within highly interconnected sexual networks.*

Table 3: STI depending on Doxy-PEP use

	Doxy-PEP	No Doxy-PEP	p
NG infection	124 **(20.4)**	483 (79,6)	
Concurrent STI	10/124 **(8.1)**	75/483 (15)	0.033

This study analyzes characteristics of NG infections in MSM: most asymptomatic and with low culture sensitivity.

Author Contact Information: cgayerbe@gmail.com
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