



Letter to the Editor - Study Letter

Screening for asymptomatic *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Mycoplasma genitalium* in medical students in Barcelona

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Received : 24 May 2020
Accepted : 28 June 2020
Published : 15 October 2020

DOI
10.25259/JSSTD_23_2020

Quick Response Code:



ABSTRACT

Objectives: No previous studies had been performed on asymptomatic sexually transmitted infections (STIs) in Spanish university students. Therefore, the aim of the study was to determine the prevalence of *Neisseria gonorrhoeae* (NG), *Chlamydia trachomatis* (CT), and *Mycoplasma genitalium* (MG) in this group.

Material and Methods: All medical students were invited to participate in the study between September 2017 and June 2019. First-void urine specimens were collected from men and vaginal swabs from women.

Results: Four females had positive results. The prevalence of CT and MG in women was 4.0% and 2.4%. All individuals with positive results had stable partners. CT infection was associated with having stable and sporadic sexual partner in the previous year. The frequency of positive results was higher in those women who had sought an app-based sexual partner.

Conclusion: The prevalence of asymptomatic STI in medical students was similar (rather than lower) to that in same age individuals in the area. Medical knowledge might not protect from STI acquisition.

Keywords: Asymptomatic sexually transmitted infection, Prevalence, University student, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Mycoplasma genitalium*

Sir,

Screening programs for asymptomatic sexually transmitted infections (STIs), especially *Chlamydia trachomatis* (CT), are inconsistent among different countries and their cost-effectiveness is a matter of debate.^[1] Many efforts have been made to target special populations such as university students in the UK and Japan.^[2] No studies are available on asymptomatic STI among Spanish university students. Therefore, we aimed to determine the prevalence of asymptomatic CT, *Neisseria gonorrhoeae* (NG), and *Mycoplasma genitalium* (MG) among medical students in the Universitat de Barcelona, Spain.

The protocol was approved by the Hospital Ethics Committee and was conducted in accordance with institutional standards. All study participants gave written informed consent. All medical students were invited to take part anonymously in the study between September 2017 and June 2019. Inclusion criteria were age between 18 and 30 years and being sexually active. Exclusion

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criteria included antibiotic intake in the previous 4 weeks and symptoms suggesting a possible STI. Anyplex® CT/NG real-time detection kit (Seegene, CT/NG sensitivity 96%, specificity 99%) was used until September 15, 2018, and multiplex real-time polymerase chain reaction Allplex® STI Essential Assay Q (Seegene, CT/NG sensitivity and specificity 100%, MG sensitivity 95%, specificity 100%) afterward due to changes in the microbiology department. Therefore, during the 1st year of the study, only CT and NG tests were performed, and during the 2nd year of the study, the tests also included MG. First-void urine specimens were collected from men and self-taken vaginal swabs were collected from women. Treatment was given, if necessary, according to the International Union against STIs guidelines.

During the inclusion period, 103 students enrolled in the study (72.8% female and 27.2% male), 31% of targeted population. All individuals were tested for CT and NG, while 55 were also tested for MG (41 females [74.5%] and 14 males [25.5%]). Sociodemographic characteristics and variables are presented in [Table 1]. Four females (3.9% of all participants, 5.3% of women) had positive results (3 CT and 1 MG). No NG infections were detected. Global prevalence of CT and MG was 2.9% (3/103, 95% confidence intervals [CI] 1.0–8.3) and 1.8% (1/55, 95% CI 0.3–9.5), respectively. Considering only women, the prevalence of CT and MG was 4.0% (3/75, 95% CI 1.4–11.1) and 2.4% (1/41, 95% CI 0.4–12.6). All individuals with positive results reported having stable partners at the time of the study. Their use of condoms was occasional and their perceived risk of STI transmission was low. A positive test for CT was associated with the combination of stable and sporadic SP over the previous 12 months ($P = 0.012$). No associations with other variables were found. The frequency of positive results was higher in those women who had sought an app-based sexual partner than those who had not (25% vs. 4.8%), but the difference did not reach statistical significance ($P = 0.08$).

The global prevalence of CT and MG found in this study is lower than the recent prevalence reported in individuals between 16 and 25 years.^[3] However the prevalence observed among female students was comparable to the CT and MG prevalence documented among asymptomatic women in the area. Therefore, the medical knowledge of the students did not imply a lower risk of STI acquisition.

All participants with positive results had stable SP and their perception of STI risk was low. Having both sporadic and stable partners in the previous year was the only risk factor associated with CT infection. This fact highlights the importance of screening based on several risk factors, rather than only the number of SP or perceived risk. Men who have sex with men (MSM) are also a well-known risk factor for STI. However, we found no positive results in MSM students.

Table 1: Patient characteristics and variables.

| Results | |
|---|-------------------|
| Age (years)±SD | 22.6±1.2 |
| Origin (%) | |
| Spanish | 92.2 |
| Other EU countries | 3.9 |
| South and Central America | 2.9 |
| Asia | 1.0 |
| Age first SI (years)±SD | 17.2±2.1 |
| Gender and sexual orientation (HT/SS/BS): | |
| Male, <i>n</i> (%) | 28 (71.4/28.6/0) |
| Female, <i>n</i> (%) | 75 (94.7/2.7/2.7) |
| Type of sexual partner/s previous 12 months (%) | |
| Stable | 57.3 |
| Sporadic | 31.1 |
| Both | 11.7 |
| Concurrence of SP previous 12 months (%) | 16.5 |
| New SP in the past 3 months (%) | 32.0 |
| Type of partner at the time of the study (%) | |
| Stable | 64.1 |
| Sporadic | 35.9 |
| Common contraceptive method (%) | |
| Condom | 65.0 |
| Hormonal contraceptives | 19.4 |
| IUD | 3.9 |
| None | 10.7 |
| Condom use in the last SI (%) | |
| Yes | 59.2 |
| No | 40.8 |
| Condom use (always/sometimes/never): | |
| Stable SP (%) | 36.4/31.2/31.2 |
| Sporadic SP (%) | 64.7/28.2/7.0 |
| Drugs (percentages of reported different types of drug use) | |
| Alcohol | 83.5 |
| Cannabis | 29.5 |
| Amphetamine | 1.9 |
| Cocaine | 1.0 |
| SI after drug use (%) | 51.5 |
| SI at the disco (%) | 5.0 |
| App-based sexual partner seeking (%) | 15.5 |
| STI last year (%) | 5.0 |
| Risk perception of STI acquisition (%) | |
| No risk | 22.2 |
| Low risk | 58.3 |
| High risk | 4.9 |
| No answer | 7.8 |
| Use of emergency contraception pill in women (%) | 44.0 |
| CT/NG previous test (%) | 6.8 |
| Cervical cytology (% women) | 69.3 |

BS: Bisexual, CT: *Chlamydia trachomatis*, EU: European Union, HT: Heterosexual, IUD: Intrauterine device, NG: *Neisseria gonorrhoeae*, SD: Standard deviation, SI: Sexual intercourse, SP: Sexual partner, SS: Same sex partners, St: Sometimes, STI: Sexually transmitted infection

Another finding to point out is the disparity between those undergoing cervical cytology and STI screening. Almost 70% of female students reported that they had had cervical cytology testing as against 6.8% who had undertaken opportunistic STI testing previously. The Spanish Ministry of Health consensus and other organizations recommend STI testing based on risk assessment.^[4] Only 6.8% of study participants undergoing STI screening previously indicates that more efforts are needed in this direction.

Relatively small sample size and not collecting rectal and pharyngeal swabs from MSM were the major limitations.

CONCLUSION

The prevalence of CT and MG in asymptomatic medical students in our setting was low and similar to asymptomatic women in Barcelona. Individuals who had both sporadic and stable partners in the previous year were at higher risk of CT infection. There is a need to ensure better compliance of health-care providers with national recommendations.

Acknowledgments

We are very grateful to Dr. Mercè Alsina for her ideas and guidance.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Riera-Monroig J, Corbeto EL, Bosch J, Fuertes I. Screening for asymptomatic *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Mycoplasma genitalium* in medical students in Barcelona. *J Skin Sex Transm Dis* 2020;2(2):134-6.