

Literature Review

National STD Curriculum Podcast

Mycoplasma Genitalium

July 15, 2021

Season 1, Episode 10

This episode reviews some of the recent literature published on *Mycoplasma genitalium*, increasingly recognized important pathogen in the STD world.

Topics:

- Mycoplasma genitalium
- STDs
- STIs
- Mgen
- Antibiotic Resistance
- Urethritis

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[Disclosures](#)

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References

[Paper #1](#) [Paper #2](#) [Paper #3](#)

Transcript

Read along with the audio or jump to a particular chapter.

In this episode:

- [Introduction](#)
- [Background](#)
- [Paper #1](#)
- [Paper #2](#)
- [Paper #3](#)
- [Summary](#)
- [Credits](#)

[00.00] Introduction

Hello everyone. My name is Meena Ramchandani. I'm an infectious disease physician at the University of Washington in Seattle. This podcast is dedicated to an STD [sexually transmitted disease] literature review for health care professionals who are interested in remaining up-to-date on the diagnosis, management, and prevention of STDs.

[00.31] Background

In this episode, I'd like to address some articles recently published on *Mycoplasma genitalium*. It's an increasingly recognized important pathogen in the STD world. So, what is *M. genitalium* or Mgen for short? It's a slow-growing bacteria associated with NGU or nongonococcal urethritis. It can also be associated with proctitis, cervicitis, pelvic inflammatory disease, as well as spontaneous abortion, but it seems to be most commonly associated with urethritis, especially in MSM [men who have sex with men]. One challenge with Mgen infection is that it's difficult to treat, and this is due to both antibiotic resistance as well as intrinsic features of the organism. For example, pretreatment macrolide resistance can be greater than 50% in some countries.

[01.20] Paper #1

Li Y, Su X, Le W, Li S, Yang Z, Chaisson C, Madico G, Gong X, Reed GW, Wang B, Rice PA. *Mycoplasma genitalium* in symptomatic male urethritis: Macrolide use is associated with increased resistance. Clin Infect Dis. 2020 Feb 14;70(5):805-810. [[PubMed Abstract](#)]

Singh AE, Manhart L. Is it time for the United States and Canada to reconsider macrolides as the first-line empiric treatment for males with symptomatic urethritis? Clin Infect Dis. 2020 Feb 14;70(5):811-813. [[PubMed Abstract](#)]

The first article to discuss was published in March 2020 by Dr. Li and colleagues in *Clinical Infectious Diseases*, and this article was titled "*Mycoplasma genitalium* in symptomatic male urethritis: Macrolide use is associated with increased resistance." I'd like to point out some interesting features of this study:

1. The authors analyzed around 1,800 men with symptomatic urethritis in Nanjing, China, for STDs—they looked at *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Mycoplasma genitalium*, and *Trichomonas vaginalis*—all by using PCR [polymerase chain reaction] techniques.
2. The authors found that the prevalence of Mgen was around 20%. This was lower than gonorrhea, which was at 46%, and chlamydia, which was at 33%, but still quite high compared to other studies that looked at Mgen prevalence. The authors also found that 54% percent of Mgen infections occurred alone, without the coinfection of another STD. Mgen infection was more common in those who took antibiotics 30 days prior to presentation.
3. In this cohort, there were very high levels of Mgen macrolide resistance-associated mutations—89% overall, which is quite high. Men who had taken macrolides in the last 30 days prior to enrollment had even higher rates of macrolide-resistant Mgen at 97% compared to those who had not taken macrolides in the 30 days prior to enrollment, which was at 87%, and this was significant with a P value less than .03.
4. Unfortunately, they also found a very high level (89%) of fluoroquinolone-resistant mutations in men with symptomatic urethritis. This level of fluoroquinolone resistance is higher than what we've seen previously reported in the literature. And the authors note that the prevalence of fluoroquinolone resistance-associated mutations are higher in the Asia-Pacific region compared to other parts of the world.

This study is one of the largest studies looking at Mgen prevalence and resistance mutations in men with symptomatic urethritis. To summarize, they found a high prevalence of Mgen causing symptomatic urethritis with high levels of macrolide and fluoroquinolone resistance mutations. They also found that participants who recently had taken a macrolide antibiotic were more likely to have macrolide resistance-associated mutations.

If you're interested in learning more, there is an excellent editorial commentary by Dr. Singh and Dr. Manhart in the same journal, which I encourage you to read. They discuss how our ability to use moxifloxacin, which is recommended for the treatment of macrolide-resistant Mgen, is being challenged by rising rates of resistance to fluoroquinolones, particularly in the Asian and Western Pacific regions. The prevalence of fluoroquinolone-

associated mutations in the U.S., Australia, and Canada have thankfully remained low, ranging from about 5–15%. What's reassuring is that not all mutations in the fluoroquinolone-resistant genes have been strongly associated with clinical treatment failure. This is important given the limited alternative antibiotics we have to treat this infection, some of which are not available in many countries.

[04.28] Paper #2

Latimer RL, Vodstrcil L, De Petra V, Fairley CK, Read TR, Williamson D, Doyle M, Chow EP, Bradshaw C. Extragenital *Mycoplasma genitalium* infections among men who have sex with men. *Sex Transm Infect.* 2020 Feb;96(1):10-18. doi: 10.1136/sextrans-2019-054058. Epub 2019 Jun 19. [\[PubMed Abstract\]](#)

The next article I'd like to discuss was published in February 2020. It was an article that was published in the journal *Sexually Transmitted Infections* entitled "Extragenital *Mycoplasma genitalium* infections among men who have sex with men," and it was written by Dr. Rose Latimer and colleagues. So, interesting features of this study:

1. It was a cross-sectional study at the Melbourne Sexual Health Centre in Australia, and it looked at Mgen coinfection with rectal chlamydia or rectal gonorrhea, as well as the prevalence of Mgen pharyngeal infection.
2. The authors evaluated 424 rectal samples from symptomatic and asymptomatic MSM who were positive for either rectal gonorrhea or chlamydia and tested these samples for Mgen using an Aptima Mgen assay, which is a transcription-mediated amplification assay. They also tested 480 pharyngeal swabs from MSM for Mgen as well.
3. The authors found that rectal Mgen was detected in 13% of chlamydia-positive rectal samples and 14% of gonorrhea-positive rectal samples. However, pharyngeal Mgen was quite uncommon and detected in only 2% of samples.
4. When the authors looked at the characteristics of either rectal chlamydia or gonorrhea cases that were coinfecting with rectal Mgen, they found that there was actually a trend towards more sexual partners in those with rectal chlamydia/Mgen coinfection versus those who had rectal chlamydia monoinfection. For example, 11 versus six partners over the last eight months, and this had a P value of .06.
5. They did not find a significant difference in terms of symptom status for MSM with isolated rectal gonorrhea or chlamydia compared to those with Mgen coinfection.
6. MSM with rectal gonorrhea and Mgen coinfection were more likely to be HIV positive than those with rectal gonorrhea monoinfection, and that had an odds ratio of 2.96, with a 95% confidence interval of 1.21 to 7.26 and a P value of 0.023.
7. Those with Mgen coinfection were less likely to be using PrEP [preexposure prophylaxis], and this had an odds ratio of 0.25, with a 95% confidence interval of 0.1 to 0.65 and a P value of .002. Some of these associations I can't entirely explain, but they're interesting to point out.

There are limited data on the prevalence of Mgen coinfection with chlamydia or gonorrhea. And so, this study really helps to show that Mgen coinfection is really high (13–14%) for those MSM diagnosed with rectal chlamydia or gonorrhea in a sexual health clinic in Australia. Currently, extragenital testing for Mgen is not currently recommended, but one really wonders if we should start screening for rectal Mgen in MSM. And I think this is a difficult question to answer for multiple reasons: We have just limited antibiotic agents available to treat this infection; many places don't have access to testing, and testing for macrolide or fluoroquinolone resistance just may not be available at all or have really long turnaround times. I'm sure we'll hear more about this emerging STD in years to come.

[07.37] Paper #3

Khosropour CM, Jensen JS, Soge OO, Leipertz G, Unutzer A, Pascual R, Barbee LA, Dombrowski JC, Golden MR, Manhart LE. High prevalence of vaginal and rectal *Mycoplasma genitalium* macrolide resistance among

female sexually transmitted disease clinic patients in Seattle, Washington. Sex Transm Dis. 2020 May;47(5):321-325.

[PubMed Abstract]

The third article I'd like to discuss is titled "High prevalence of vaginal and rectal *Mycoplasma genitalium* macrolide resistance among female STD clinic patients in Seattle, Washington." This was published by Dr. Christine Khosropour and colleagues in *Sexually Transmitted Diseases* in February 2020.

1. So, this study looked at the prevalence of vaginal and rectal Mgen infection and Mgen coinfection with chlamydia or gonorrhea in symptomatic and asymptomatic women in an STD clinic.
2. They enrolled 50 women and found 13 women (26%) tested positive for Mgen in vaginal and rectal specimens; two had vaginal Mgen, three had rectal Mgen, and eight had both vaginal and rectal Mgen.
3. Of those 13 women that were positive for Mgen, five were coinfecting with chlamydia and none with gonorrhea. Now, with the small numbers that were enrolled, this came out to 38% of patients.
4. The study group also took a look at those Mgen specimens that had macrolide resistance- or quinolone resistance-associated mutations, and they found 100% of rectal and 89% of vaginal specimens had macrolide-resistant mutations—this is really high! The good news was that none of the specimens they looked at had quinolone resistance-associated mutations.

In this study, the authors showed that rectal and vaginal Mgen in women does occur, and there might be a high prevalence of macrolide-resistant strains in rectal and vaginal specimens from women. Although the health implications of women with undiagnosed or untreated Mgen infection remains to be determined, the authors note that these data suggest that macrolides used to treat chlamydia infection might actually influence the antimicrobial susceptibility of Mgen to this antibiotic.

[09.25] Summary

To conclude, I'd like to summarize some key points from this session:

1. In the studies we looked at, *Mycoplasma genitalium* might have high prevalence in MSM and women attending sexual health clinics.
2. When rectal Mgen is found, coinfection with rectal chlamydia or gonorrhea can be common.
3. There is a high prevalence of Mgen with macrolide resistance in the community, and treatment of other bacterial STIs [sexually transmitted infections] with macrolides such as azithromycin may lead to increases in antimicrobial-resistant Mgen.

[09.58] Credits

This podcast is brought to you by the National STD Curriculum, the University of Washington STD Prevention Training Center, and is funded by the Centers for Disease Control and Prevention. Thank you for listening.

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