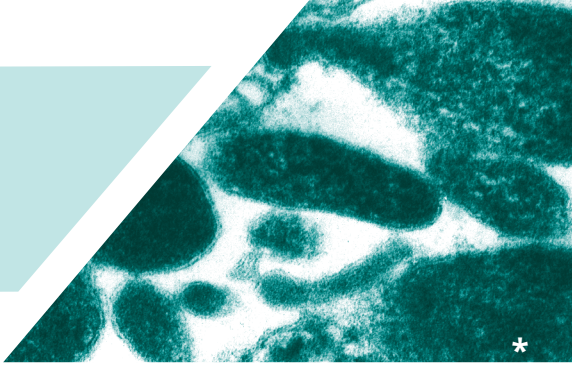
Emerging STI Superbug:
Mycoplasma genitalium



Antibiotic Resistance in *M. genitalium*

- *M. genitalium* is a recognised STI, treated syndromically, with clinical presentation similar to that of *Chlamydia trachomatis*.[1]
- Mutations in the 23S rRNA gene of *M. genitalium* have been linked with clinical treatment failure and high level *in vitro* macrolide resistance.[2]
- Macrolide resistance mediating mutations have been observed in 20-50% of cases in the UK, Denmark, Sweden, Australia, and Japan.[3]
- Resistance is already developing towards the second-line treatment moxifloxacin (fluoroquinolone).[5]

Treatment options are limited. Inclusion of an antibiotic resistance test in your therapy algorithm will likely improve patient outcome.[5]

Up to 50% of infections may be resistant.[5]

Treatment fails in up to 30% of cases in some regions.[6]

Resistance screening may greatly improve patient outcomes.[6]

- Omitting a macrolide resistance screen when testing for MG, may lead to inappropriate patient antimicrobial treatment.
- Ineffective antimicrobial treatment can result in persistent infection and ultimate spread of MG which is antimicrobial resistant (AMR).
- Diagnosis is recommended using nucleic acid amplification testing (NAAT) which includes an assessment of macrolide resistance.[6]
- Screening for *M. genitalium* with a combination of detection and macrolide resistance mutations will provide much needed information to develop personalised antimicrobial treatments and improve patient outcome.[6,7]

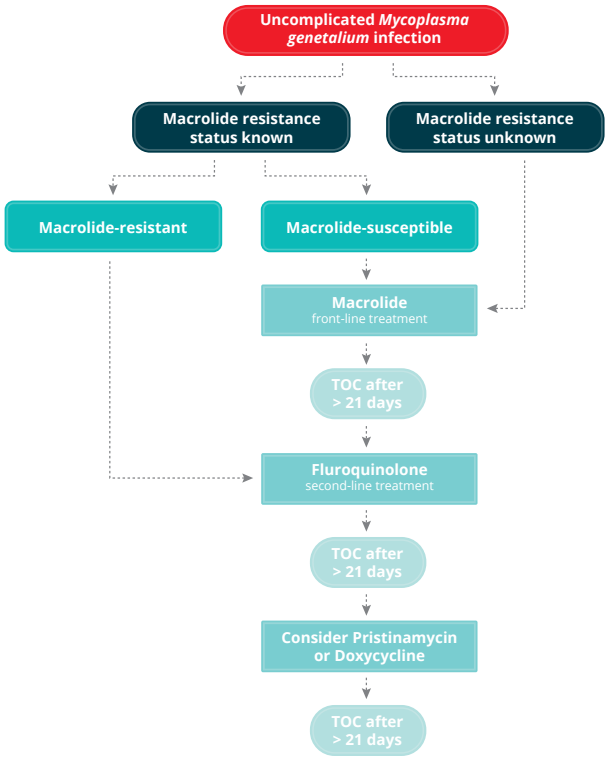


Figure 1 | *For patients infected with macrolide-resistant strains, determination of resistance status will reduce time to effective treatment and improve patient outcome*

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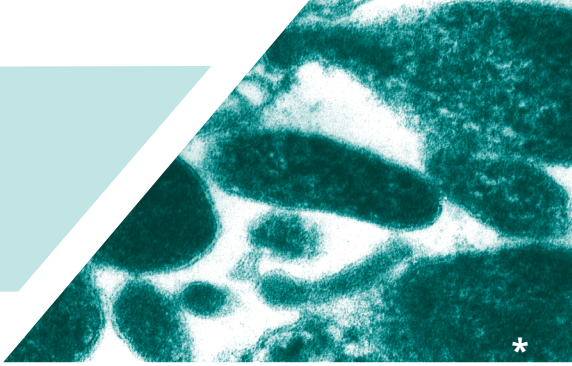
Mycoplasma genitalium



- *M. genitalium* (MG) was first identified in the 1980s[8] and is now a recognised sexually transmitted infection (STI), more prevalent than *N. gonorrhoeae* in many populations.[9] *M. genitalium* is associated with 10–35% of non gonococcal urethritis (NGU),[7,10] and as much as 45% of persistent/recurrent urethritis.[6]
- *M. genitalium* is an extremely fastidious and slow growing organism,[3] making nucleic acid amplification testing (NAAT) the only viable diagnostic solution.[6,9] Treatment options are limited as mycoplasma lack a cell wall, thus are unaffected by many common antibiotics.[9,10] Of additional concern is the apparent rapid rate of mutation of MG, resulting in an alarming increase in AMR over relatively short periods of time.[3]

Potential Health Risks

- Most *M. genitalium* cases are asymptomatic, any associated symptoms are similar to those caused by other STI pathogens such as *Chlamydia trachomatis*.[1]
- The presence of *M. genitalium* is associated with an increased risk of NGU[10] and of acquiring HIV.[12]
- Increased risk of cervictis, PID, preterm birth, spontaneous abortion and infertility in women.[11]

SIGNS AND SYMPTOMS

- Urethritis
- Mucopurulent cervicitis
- Cervical or vaginal discharge
- Acute pelvic pain and/or PID

RISK FACTORS

- Individuals with high-risk sexual behaviour
- Sexual contact with individuals diagnosed with an STI or PID
- Contact with individuals infected with *M. genitalium*

Improve patient management. Test for macrolide resistance.

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References 1. Manhart LE and Kay N. Mycoplasma genitalium: Is It a Sexually Transmitted Pathogen? Curr. Infect. Dis. Reps. 2010; 12(4):306-313. **2.** Jensen JS. et al. Azithromycin Treatment Failure in Mycoplasma genitalium–Positive Patients with Nongonococcal Urethritis Is Associated with Induced Macrolide Resistance. Clin. Infect. Dis. 2008; 47(12): 1546-1553. **3.** Jensen JS and Bradshaw C. Management of Mycoplasma genitalium infections – can we hit a moving target? BMC Infect. Dis. 2015; 15 :343. **4.** Couldwell DL, Tagg KA, Jeoffreys NJ, Gilbert GL. Failure of moxifloxacin treatment in Mycoplasma genitalium infections due to macrolide and fluoroquinolone resistance. Int. J. STD AIDS. 2013 Oct;24(10):822-8. **5.** Unemo, M. & Jensen, J.S. 'Antimicrobial-resistant sexually transmitted infections: gonorrhoea and Mycoplasma genitalium'. 2016. Nat. Rev. Urol..268. Published online 10 Jan 2017. doi:10.1038/nrurol **6.** Jensen, M Cusini, M Gomberg. 2016 European guideline on Mycoplasma genitalium infections. **7.** Tabrizi SN et al. Multiplex Assay for Simultaneous Detection of Mycoplasma genitalium and Macrolide Resistance Using PlexZyme and PlexPrime Technology. PLoS ONE. 2016. 11(6): e0156740. doi:10.1371/journal.pone.0156740 **8.** Tully JG, Taylor Robinson D, Cole RM, Rose DL. A newly discovered mycoplasma in the human urogenital tract. Lancet. 1981; I: 1288–91. **9.** Centers for Disease Control and Prevention, 2015 Sexually Transmitted Diseases Treatment Guidelines. **10.**Taylor-Robinson D and Jensen JS. Mycoplasma genitalium: from Chrysalis to Multicolored Butterfly. Clin. Microbiol. Rev. 2011; 24(3): 498-514. **11.** Lis R, Rowhani-Rahbar A, and Manhart LE. Mycoplasma genitalium Infection and Female Reproductive Tract Disease: A Meta-analysis. Clin. Infect. Dis. 2015; 61 (3): 418-426. doi: 10.1093/cid/civ312 **12.** Napierala Mavedzenge, S Weiss HA. Association of Mycoplasma genitalium and HIV infection: a systematic review and meta-analysis. AIDS. 2009; 23: 611–20. * Electron micrograph depicting *M. genitalium* adhering to Vero cells. EM performed by Jens Blom from culture by Jørgen Skov Jensen, Statens Serum Institut.

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