Prevalence and risk factors associated with *Mycoplasma genitalium* infection in a South African women cohort

**Introduction**

*Mycoplasma genitalium* is a sexually transmitted organism associated with cervicitis, pelvic inflammatory disease, and infertility in women. Beside cohorts of Ugandan and Kenyan female sex workers, limited information is available about *M. genitalium* infections in women from sub-Saharan Africa.

Our aim was to determine prevalence and identify risk factors of *M. genitalium* infection in a cohort of women in rural South Africa.

**Materials and Methods**

- Vaginal, anorectal and oropharyngeal dry swabs were available for 601 women aged 18-49 years recruited at primary healthcare facilities from Mopani district between November 2011 and February 2012. Eligibility criteria were sexual activity, consent to have three anatomic sites tested and not having menses on day of recruitment. Demographic, clinical, and sexual behavioural data were collected by questionnaire. HIV-status was self-reported.

- DNA was isolated on the Roche X480 and the *M. genitalium* detection was performed on 601 vaginal and rectal and 98 randomly selected pharyngeal extracts using the open channel on the cobas® 4800 system (Roche Molecular Systems) with the *Mycoplasma genitalium* LightMix® kit (TIB MOLBIOL) (1).

- For macrolide resistance, detection of mutations in the 23S rRNA gene was performed on *M. genitalium*-positive extracts by PCR and sequencing (2). Statistical analysis was performed using chi-square and Fisher’s exact tests and Mann-Whitney test.

**Results**

- **Prevalence of *M. genitalium* infection and macrolide resistance**
  - Prevalence of vaginal and rectal *M. genitalium* infection was 8.7% (52/601; 95% confidence interval [CI] 6.4-10.9%) and 2.7% (16/601; 95% CI 1.4-3.9%), respectively. *M. genitalium* infection was concurrent (at both genital and rectal sites) in only 3 women; there was no statistically significant association between genital and rectal infection (p=0.15). No oral infection was detected among the 98 randomly-selected pharyngeal DNA extracts tested. Overall, 11% (65/601; 95% CI 8.3-13%) of women were infected with *M. genitalium*.

- The prevalence of *M. genitalium* infection was higher in women aged 18-25 years than in older women, 16.1% (vaginal 12.4%, rectal 4.3%) vs 8.2% (vaginal 6.8%, rectal 1.9%), (OR 2.1; 95% CI 1.3-3.6%, p=0.004).

- Among the 52 vaginal and 16 rectal *M. genitalium*-positive samples, 2 vaginal and 2 rectal ones were positive with a *M. genitalium* strain mutated in the 23S rRNA. Thirty-one vaginal and 6 rectal specimens harboured a wild-type *M. genitalium*; it was not possible to determine a readable *M. genitalium* sequence for 19 vaginal and 8 rectal samples. All the mutated specimens harboured the A2058G mutation (*Escherichia coli* numbering), the most common one involved in macrolide resistance. In one vaginal specimen, a mixed population of wild-type bacteria and an A2058G mutant was observed.

- Coinfection between *M. genitalium* and *Chlamydia trachomatis*, *Neisseria gonorrhoeae* and *Trichomonas vaginalis* was found in 19%, 12% and 27% of women, respectively (R. P. H. Peters, personal data).

**Association of symptoms and risk factor analysis**

- There was no association between vaginal or rectal symptoms and *M. genitalium* infection. Stratified analysis by HIV status did not reveal any effect of HIV infection on association of symptoms with infection.

- Univariate and multivariate analyses to identify factors independently associated with *M. genitalium* infection were conducted (Table 1). Overall, age and HIV infection were significantly associated with *M. genitalium* infection in the multivariate analysis.

**Table 1. Multivariate analysis of factors associated with *M. genitalium* infection**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Adjusted OR (95% CI)</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Age (per year increase)</td>
<td>0.93 (0.89-0.98)</td>
<td>0.001</td>
</tr>
<tr>
<td>HIV-infected</td>
<td>2.1 (1.4-1.1)</td>
<td>0.022</td>
</tr>
<tr>
<td>Pregnant</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Receptive anal intercourse</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

OR, odds ratio; CI, confidence interval; NS, not significant. Multivariate analysis was using forward LR logistic regression analysis. A p-value of <0.05 was considered as statistically significant for all tests.

**Conclusions**

- *M. genitalium* vaginal infection was highly prevalent in this South African population, close to the prevalence described in other African resource-limited settings. An association between HIV status and *M. genitalium* infection was observed in this study as previously described. *M. genitalium* rectal infection was less common and our data confirm that *M. genitalium* infection is not sustained in the pharynx.

- To our knowledge, this is the first description of macrolide resistance in *M. genitalium*-positive specimens from South Africa, with a prevalence of 9.75% (4/41) in this cohort of 601 South African women. It should be noted that the syndromic treatment for vaginal discharge in South Africa does not include macrolides. Only the syndromic treatment for genital ulcer disease includes erythromycin.

**References**


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