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Genotyping of *Chlamydia trachomatis* from Vaginal Swabs by Restriction Analysis of the Outer Membrane Protein Gene

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ABSTRACT

Background: *Chlamydia trachomatis* (*C. trachomatis*) is a common cause of bacterial sexually transmitted infections (STIs). The genetic characterization of *C. trachomatis* serovars reveals significant genetic diversity in this organism. This study investigated the diversity of *C. trachomatis* serovars in human immunodeficiency virus (HIV)-infected pregnant women in South Africa.

Methods: This was a cross-sectional study. For this study, 385 vaginal swab samples were tested for the presence of *C. trachomatis*. The swabs were collected from HIV-infected pregnant women at the King Edward VIII Hospital in Durban, South Africa. The vaginal swab samples collected from these women were analyzed for the presence of *C. trachomatis*. Molecular genotyping of *C. trachomatis* positive samples was performed by an outer membrane protein (omp1) semi-nested polymerase chain reaction assay. The omp1 gene from *C. trachomatis* was amplified. The positive amplicons were digested with restriction enzymes AluI, DdeI and HinfI for the assignment of serovars and visualized after electrophoresis on a 2% agarose gel. All statistical analyses were conducted using RStudio, version 3.6.3.

Results: The prevalence of *C. trachomatis* in the study population was 12.2% (47/385). Serovar E (46.5%) was the most frequent serovar in our study population, followed by serovars F (20.9%), G (14.0%) and D (11.6%). Serovar I (4.7%), which was detected in two samples, was the least frequent. Risk factors for *C. trachomatis* include having a low level of education, being unemployed, being unmarried, not cohabitating, early age of first sex, high number of lifetime sex partners, a partner having other partners, lack of condom use, lacking symptoms of STIs, and lacking treatment for STIs.

Conclusion: Five different serovars were observed among the participants. The high genetic diversity observed in this study contributes to the challenges regarding future vaccine design and the development of antigen-based rapid diagnostic tests for Chlamydia.

Keywords: Chlamydia, Sexually transmitted infections, Pregnant women, Serovars, South Africa

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