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Chlamydia trachomatis infection in a sample of northern Brazilian pregnant women: prevalence and prenatal importance

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ABSTRACT

There are limited data regarding prevalence of *Chlamydia trachomatis* infection among northern Brazilian pregnant women.

Objective: The purpose of this study was to estimate the prevalence of chlamydial infection among pregnant women in their third trimester and to determine the repercussion of this infection on their offspring.

Methods: In the first phase of this study 100 pregnant women receiving prenatal care in a local public university hospital were examined to assess the prevalence of genital *C. trachomatis* infection by polymerase chain reaction technique. In the second phase, 88 pregnant women were prospectively evaluated for premature rupture of membranes, puerperal consequences associated with chlamydial infection, and neonates were checked for low-birth weight.

Results: The prevalence rate of chlamydial infection was 11%, and 72.7% of the positive participants were predominantly less than 30 years of age ($p = 0.1319$). A total of 36.4% of the participants had premature rupture of membranes ($p = 0.9998$). Neither low-birth weight infants nor preterm delivery were observed. A cohort of 16 newborn babies were followed-up up to 60 days of life to ascertain outcome: 50% had respiratory symptoms. Neonates born to infected mothers had a higher risk to develop respiratory symptoms in the first 60 days of life.

Conclusion: The scarcity of data about the effects of chlamydial infection on pregnancy and neonatal outcomes justified this study. Diagnosing and treating chlamydial infection during the third trimester of pregnancy may prevent neonate infection. Therefore, preventive screening should be seen as a priority for early detection of asymptomatic *C. trachomatis* infection as part of local public health strategies.

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Introduction

Chlamydia trachomatis infection is nowadays considered the most frequent sexually transmitted disease (STD) in the developed world. The World Health Organization (WHO) estimate that annually nearly 100 million new cases occur around the world.[1] Studies show that chlamydial infections is the commonest transmitted bacterial disease in European countries and in the United States with more than 2.8 million new cases estimated to occur each year.[2] During 2009, more than 1.2 million cases of chlamydial infection were reported to Centers for Diseases Control (CDC). Prevalence of chlamydial infection was 6.8% among sexually active females aged 14–19 years.[3]

According to the CDC, *C. trachomatis* infection among pregnant women in the United States is the third main cause of STD, with bacterial vaginosis and herpes simplex virus 2 being first and second, respectively.[3]

In Brazil, according to STDs epidemiologic studies in specific groups of women that attended gynecology, family planning, and prenatal clinics showed a prevalence of 2.1–27.1% for genital infection by *C. trachomatis*.[4] In the Amazon region, there is little data about the actual prevalence of chlamydial infections. Only AIDS, HIV in pregnant women and children, syphilis in pregnant women, and congenital syphilis have compulsory notification.[5]

In Manaus, the capital city of the state of Amazonas (AM), Brazil, Alencar et al. established a 27.1% prevalence of chlamydial infection by direct immunofluorescence technique.[6] On the other hand, Santos et al. and de Lima Freitas found 20.6% and 52.8% of sexually active women and infertile women, respectively, to be positive for *Chlamydia* using PCR technique.[7,8]

Many studies have provided estimates of chlamydial infection in pregnant women throughout the world. *C. trachomatis* disease, considered to be a treatable condition, continues to infect massive populations and the exact magnitude of this is still unknown.[9,10] Prevalence rates among pregnant women vary enormously around the world.[9,11] Jalil et al. conducted a study to estimate the prevalence of *C. trachomatis* infection in pregnant women from six Brazilian cities and found 9.4% using hybrid capture technique.[12] On the other hand, in Fortaleza, the capital city of Ceará, Brazil, Martins et al. found a prevalence of 11% in pregnant women by PCR technique.[13]

Uncomplicated *C. trachomatis* cervicitis in pregnancy may result in sporadic and recurrent miscarriage, preterm labor, premature rupture of membranes, low birth weight and postpartum endometritis.[14]

Maternal *C. trachomatis* infections have been associated with increased morbidity in newborns and infants up to three months of age. Approximately two thirds of neonates born vaginally to infected mothers will become infected at birth.[15] These infections can result in conjunctivitis, otitis media, pharyngitis and pneumonia in the newborn. Moreover, neonatal infection with *C. trachomatis* can cause long-term sequelae such as chronic obstructive pulmonary disease.[14]

The primary aim of this study was to assess the prevalence of *C. trachomatis* in the final trimester among pregnant women who attended the low-risk prenatal clinic of a public health university hospital in Manaus, Amazonas, Brazil. In Manaus, there are no studies related to vertical transmission of *C. trachomatis*, so the secondary aim of this study was to ascertain possible neonatal implications associated to maternal *C. trachomatis* infection. Moreover, the purpose of this study was to evaluate *C. trachomatis* infection rate associated with socio-economic status of the participants enrolled in the study, adverse pregnancy outcomes associated with miscarriage, preterm labor, premature rupture of membranes and low birth weight.

Materials and methods

Endocervical samples were collected from 100 pregnant women receiving care at the low-risk prenatal clinic of Dona Francisca Mendes University Hospital in Manaus, Amazonas, Brazil, between January and June 2005. The first phase of this study was a cross-sectional evaluation of the prevalence of *Chlamydia* infection in the final trimester of pregnancy (as of 29 weeks of gestation). In the second phase of this study, pregnant women were prospectively followed to evaluate postpartum effects of this infection as well as upon their neonates up to sixty (60) days after birth.

This study was approved by the Human Research Ethics Committee at the Federal University of Amazonas and performed in accordance with the Declaration of Helsinki.

Assessment of patients

Pregnant women included in this study answered a standardized questionnaire to collect information on age, marital status and medical history, number of lifetime sexual partners and socio-economic status. Family income and education level were the criteria used to determine socio-economic status. Patients were excluded if the gestational age was less than 28 weeks and six days, had infections requiring antibiotic therapy or a history of antibiotic use in the preceding 30 days. In addition, pregnant women who had sexual intercourse in the past 72 h, history of vaginal bleeding or who used vaginal cream, suspected premature rupture of the membranes, and a diagnosis of placenta previa were also excluded.

In the first phase of the study all participants were contacted by telephone so that the researchers could collect information about their maternity admission and start the second phase of the study. During the second phase of the study 88 pregnant women who met the eligibility criteria had their delivery checked and were followed-up for 60 days after giving birth. Of a total of 100 participants in the first phase of the study 12 were excluded from the study: four could not be contacted and eight due to insufficient follow-up time (less than 40 days of postpartum).

A cohort study was carried out in 88 newborns who were evaluated in the first 24 h and monitored thereafter every 15 days up to 60 days of life. However, 12 neonates were excluded due to loss of contact (four) and to follow-up time less than 60 days of life (eight). Moreover, one case of stillbirth occurred. Subsequent evaluations were conducted by telephone and if some ocular discharge or respiratory symptoms appeared in the neonate a clinical evaluation was requested. Furthermore, patient's complaints, clinical evaluation and physical exams