The Prevalence of *Chlamydia trachomatis* Infection in Pregnant Thai Women

PICHAI CHOTNOPPARATPATTARA, MD*,
SOMPOP LIMPONGSANURAK, MD*
ADISORN WONGPRECHASAWAS**

Abstract

Chlamydia trachomatis infection is the most common sexually transmitted infection. It can cause pelvic inflammatory disease and subsequently result in tubal infertility. *Chlamydia trachomatis* infection in pregnancy can also cause neonatal conjunctivitis and pneumonia. This descriptive study showed that *Chlamydia trachomatis* infection of the cervix among pregnant women, more than 37 weeks of gestation, attending the prenatal clinic at King Chulalongkorn Memorial hospital was found in 10 per cent by means of multiplex polymerase chain reaction (PCR) technique and 2 per cent by using culture method. The present study demonstrated that all the 182 newborn infants had no neonatal *Chlamydia trachomatis* infection by using multiplex PCR and culture method. All the babies had Apgar's score of more than 7. At 2 months follow-up, 155 infants were evaluated and had no evidence of *Chlamydia trachomatis* infection.

Key word : *Chlamydia trachomatis*, Pregnancy

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Chlamydia trachomatis infection is now recognized as one of the most prevalent of all sexually transmitted diseases. It can cause serious sequelae despite the absence of symptoms in some people. It can also result in pre-term birth, premature rupture of the membranes, a low birth weight infant and puerperal infection[1].

The overall prevalence of chlamydial infection in pregnant women is 8-11 per cent[2-4]. In the study of a Thai population, Thongkrajai et al[5]

* Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330,
** Health Promotion Center Region 6, Khon Kaen, Thailand.

reported a 4.6 per cent prevalence of chlamydia trachomatis infection among women in a rural area of Khon Kaen province in Thailand. They also found that chlamydia trachomatis infection was more prevalent among women in the reproductive period (age 20-49 years)[5].

In addition, the cross sectional study of pregnant women at first antenatal visit in Chiang Rai and Bangkok demonstrated that chlamydial infection was the most common sexually transmitted diseases[6]. They reported that chlamydia trachomatis infection in first catch urine specimen, by using amplicor polymerase chain reaction, was detected in about 5.7 per cent.

The authors aimed to determine the prevalence of cervical chlamydial infection among term pregnant women in our population.

Chlamydia trachomatis infection during pregnancy is also a leading cause of infant morbidity such as neonatal eye infection and interstitial pneuminia[7]. The data of adverse outcomes among Thai neonates have not been demonstrated. The authors also evaluated neonatal birth weight, infant's Apgar scores and neonatal outcome at the age of 2 months.

MATERIAL AND METHOD

A total of 200 pregnant women, more than 37 weeks of gestation, attending the prenatal clinic at King Chulalongkorn Memorial hospital, Bangkok, were screened for chlamydia trachomatis. The study was conducted from January 1995 to February 1995.

Vaginal speculum was introduced to identify the cervix. Vaginal discharge was collected for microscopic exam. Cervical mucous was cleansed. ENT swab was introduced through the squamocolumnar junction and brushed around the endocervical canal. After brushing thoroughly, the ENT swab was placed in a plastic tube containing 1 ml of transport media. The plastic tube was frozen at -4°C immediately. The specimen was obtained for culture for chlamydia trachomatis and for performing multiplex PCR assay within 24 hours.

Primer A : AGACTTCAGAGGAGCGTTTAC
Primer B : GGACATTTTGCGGATAGGTTA
Primer C : TAGGAAGGATGCTGTT
Primer D : AGAAATGTCGTTAGAA

Fig. 1. Deoxyribonucleic acid (DNA) sequences of in-house primers of plasmid DNA of *Chlamydia trachomatis*.

All endocervical specimens were tested for the presence of chlamydia trachomatis with cycloheximide-treated McCoy cells culture and with multiplex polymerase chain reaction (PCR). PCR testing was performed using in-house primers of plasmid deoxyribonucleic acid (DNA) of chlamydia trachomatis (Fig. 1).

Newborn infants were evaluated immediately postpartum. Swabs were applied at 2 sites at both conjunctival mucosa and oropharynx. The swabs were tested for the presence of Chlamydia trachomatis with cycloheximide-treated McCoy cells culture and with multiplex PCR. Subsequently, tetracycline eye preparation was installed at the conjunctiva. At 2 months of age, the infants were scheduled for chlamydial testing with culture and PCR. In case of lost-to-follow-up, evaluation was performed by mail and/or telephone. Analysis was performed with the use of descriptive statistics. The statistical analysis was performed with the use of SPSS for windows version 9.0.

RESULT

A total of 200 pregnant women were tested for chlamydial infection of the cervix at the prenatal clinic. The mean age was 24.8 ± 4.8 years of age, ranging from 15-39 years of age (Table 1). Most of them were primigravida. The mean gestational age at which the test performed was 38.0 ± 1.0 weeks (Table 1). There was one case of twin pregnancy. Four cases were found to be positive for chlamydial culture. The prevalence rate of chlamydial infection at the cervix

Table 1. The characteristics of the study population.

Characteristics	Mean ± SD	Range
Age (years)	24.8 ± 4.8	15-39
Gestational age (weeks)	38.0 ± 1.0	37-42
Neonatal birth weight (grams)	3,125 ± 369.2	1,840-4,320

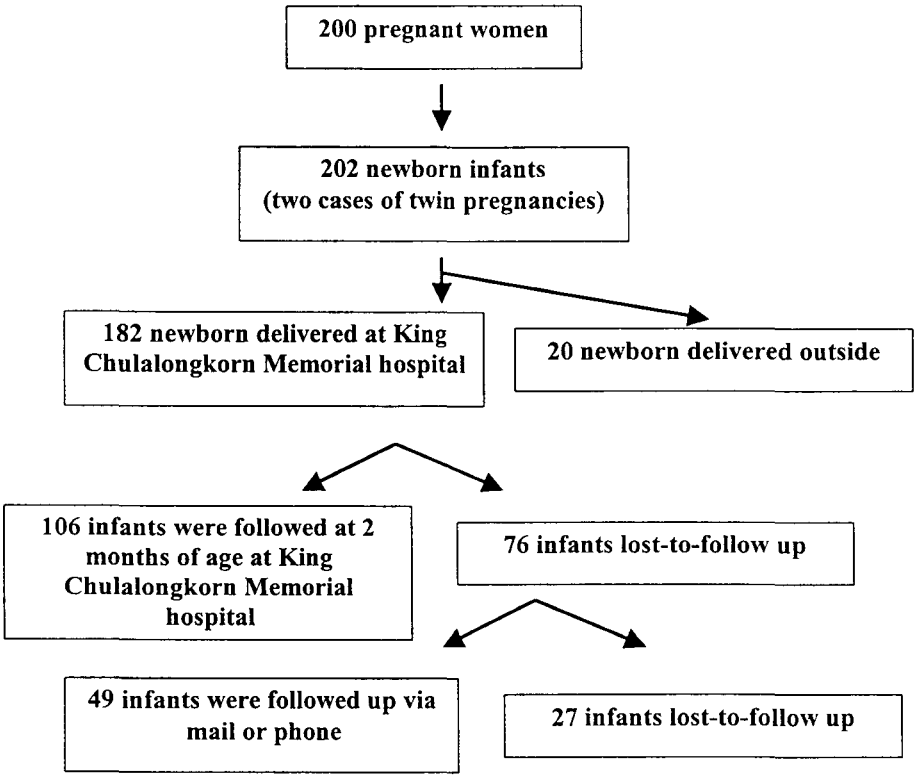

Fig. 2. Illustration of newborn follow-up.

by using the PCR technique was 10 per cent (20 cases). All positive-culture women had a positive result for PCR.

All of the chlamydial infected mothers were followed at our institute until 2 months- postpartum. One hundred and eighty two newborns were evaluated (Fig. 2). There was no case of chlamydial infection in the newborn. The mean birth weight was 3,125.2 ± 369.2 grams, ranging from 1,840-4,320 grams (Table 1). All the newborn infants had Apgar's scores higher than 7 at 1 minute.

At 2 months of age, 155 children (76.7%) were followed (Fig. 2). One hundred and six children were evaluated at our institute. All the children whose mothers had chlamydial trachomatis infection were followed at the early postpartum period and at 2 months of age. Regarding the positive-PCR result of the mothers, none of the children had evidence of chlamydial infection. .

DISCUSSION

In this study, the authors demonstrated the nucleic acid amplification assays were more effective for detection of cervical chlamydial infection than conventional tests. Also, Watson et al[8] showed in the meta-analysis that nucleic acid amplification techniques performed best for both urine and cervical swab specimen in low prevalence populations.

However, Kissin et al[9] followed sexually active women for up to 3 years and found that none of the women with positive ligase chain reaction and negative chlamydial culture had evidence of subsequent pelvic inflammatory disease or ectopic pregnancy. In addition, the selection of a diagnostic test for detection of chlamydial genital infection depends on availability, local expertise, and prevalence of chlamydia trachomatis in the test population.

Studies in Thailand showed the prevalence of chlamydia trachomatis infection in women varied

from 4.6 to 20 per cent[5,6,10,11]. Limpakarnjanarat et al[6] found that the prevalence of chlamydia trachomatis infection among Thai female sex workers in Chaing Rai was 20 per cent.

However, the prevalence of chlamydia trachomatis infection in the general population should be lower than that of female sex workers. Thongkrajai et al[10], performed a cross sectional study in a rural area of northeast Thailand to determine the prevalence of cervical chlamydia trachomatis infection in women attending antenatal, postpartum and family planning clinics. They found that the prevalence of cervical chlamydia trachomatis infection among women attending the antenatal, postpartum and family planning clinics was 6.8 per cent, 5.2 per cent and 6.7 per cent respectively

The prevalence of chlamydia trachomatis infection among pregnant women was similar to that of the general population. Kilmarx et al[12] demonstrated that the prevalence of chlamydia trachomatis infection, using amplicor polymerase chain reaction assays, was 5.7 per cent. They also found a higher prevalence among younger women and women registering later for antenatal care.

While Chaisilwattana et al[13] demonstrated that the prevalence rate of chlamydia trachomatis infection among pregnant women was 9.2 per cent, they also showed that young age, primigravida status and a history of multiple sex partners were associated with chlamydia trachomatis infection.

The present result showed quite a high prevalence rate of chlamydia trachomatis infection among pregnant women. However, it was comparable to previous studies from Thailand[12,13].

Rastogi et al[14] demonstrated in their prospective study that chlamydia trachomatis infection among pregnant women increased the risk of premature delivery and stillbirths. Furthermore, Martin et al [15] also found that the rates of prematurity and low-birth weight infants were significantly increased in the cervical chlamydial infection group when compared to the no infection group.

Because of the high prevalence rate and adverse pregnancy outcome, pregnant mothers should be screened for chlamydia trachomatis. However, the test is not readily available in a low-resource setting like Thailand. A cheap, simple and reliable screening test is necessary.

Spanns et al[16] showed the prevalence of neonatal chlamydial conjunctivitis was 0.24 per cent and chlamydial pneumonia was 0.28 per cent. The authors did not find neonatal chlamydial infection during the first 2 months of age in the present study. This is may be due to the small number of the study population..

In conclusion, the prevalence rate of chlamydial infection among pregnant women more than 37 weeks of gestation was 10 per cent. In the presented population, there was no evidence of neonatal chlamydial infection during the first 2 months of age.

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ความชุกของการติดเชื้อ *คลามัยเดีย ทราโคมาติส* ในสตรีตั้งครรภ์ครบกำหนด

พิชัย โชตินพรัตน์ภัทร, พบ,*
สมภพ ลิ้มพงศานุรักษ์, พบ, อดิศร วงศ์ปรีชาสวัสดิ์***

การติดเชื้อ*คลามัยเดีย*เป็นโรคติดต่อทางเพศสัมพันธ์ที่พบบ่อยที่สุดในสตรีวัยเจริญพันธุ์ การติดเชื้อ*คลามัยเดีย*ก่อให้เกิดการอักเสบในอุ้งเชิงกราน มีผลให้หลอดมดลูกอุดตันและเป็นสาเหตุของภาวะมีบุตรยากได้ นอกจากนี้การติดเชื้อ*คลามัยเดีย*ระหว่างตั้งครรภ์อาจทำให้ทารกแรกเกิดเยื่อบุตาอักเสบและปอดบวม การศึกษานี้พบว่า อุบัติการณ์ของการติดเชื้อ*คลามัยเดีย*ในสตรีตั้งครรภ์ที่มีอายุครรภ์มากกว่า 37 สัปดาห์ ที่คลินิกฝากครรภ์ โรงพยาบาลจุฬาลงกรณ์ ประมาณร้อยละ 10 เมื่อตรวจด้วยวิธีพีซีอาร์ (polymerase chain reaction) แต่ผลการเพาะเชื้อพบเพียงร้อยละ 2 จากการตรวจติดตามทารกแรกคลอด 182 ราย ไม่พบทารกติดเชื้อ*คลามัยเดีย*เมื่อตรวจด้วยวิธีพีซีอาร์และการเพาะเชื้อ ทารกแรกเกิดทุกรายมีคะแนน Apgar ที่ 1 นาที มากกว่า 7 และเมื่อทารกครบอายุ 2 เดือน ตรวจติดตามได้ 155 ราย ไม่พบทารกติดเชื้อ*คลามัยเดีย*เช่นกัน

คำสำคัญ : *คลามัยเดีย, การตั้งครรภ์*

พิชัย โชตินพรัตน์ภัทร, สมภพ ลิ้มพงศานุรักษ์, อดิศร วงศ์ปรีชาสวัสดิ์
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* ภาควิชาสูติศาสตร์–นรีเวชวิทยา, คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย, กรุงเทพ ฯ 10330
** ศูนย์ส่งเสริมสุขภาพ แม่และเด็ก เขต 6, ขอนแก่น