Current Status of the Screening of Chlamydia trachomatis Infection Among Japanese Pregnant Women

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To the Editor

Chlamydia trachomatis (CT) infection in pregnancy can cause maternal disease, adverse pregnancy outcomes, and neonatal disease [1-6]. In general, approximately 80% of CT infected women are asymptomatic or minimally symptomatic. Therefore, screening is the only means to effectively identify infections [2]. In Japan, pregnant women are routinely tested for CT with the Japanese public funds. According to the guidelines for obstetrical practice in Japan [7], Japanese obstetricians must provide a test for the detection of CT for the prevention of neonatal CT infection and diagnose urogenital CT infection when CT is detected using polymerase chain reaction (PCR), strand displacement amplification, transcription mediated amplification, an enzyme immunoassay, or culture methods in specimens obtained from the uterine cervix (CT nucleic acid detection tests). However, CT antibody detection by IgA tests has been substituted for these methods by some of obstetricians.

On October 2014, we requested 2,544 obstetrical facilities that are members of Japan Association of Obstetricians and Gynecologists (JAOG) to provide information of CT screening tests in pregnant women between October 2013 and March 2014. A total of 1,644 (64.6%) of 2,544 obstetrical facilities responded with possible statistical analysis information on a total of 328,788 women, accounting for approximately 65% of all deliveries that occurred in Japan during the study period. Of the 1,644 obstetrical facilities, CT nucleic acid detection PCR tests, CT nucleic acid detection tests except PCR and CT antibody detection tests were performed in 1,221 (74.3%), 408 (24.8%) and 15 (0.9%) facilities, respectively.

Table 1 shows the maternal age distribution under the three CT screening tests (CT nucleic acid detection tests with and without PCR and CT antibody detection tests). There were no significant differences in the maternal age distribution among the three CT screening tests groups.

Table 2 shows the results of CT screening tests (CT nucleic acid detection tests with and without PCR and CT antibody detection tests) of the study population by age. There were no significant differences in the rate of positive CT between the two groups of CT nucleic acid detection screening tests with and without PCR. However, the positive rate by the CT antibody detection tests was significantly higher than those by the two CT nucleic acid detection tests with and without PCR (P < 0.01 by X² test).

The current CT prevalence rate in the Japanese pregnant women with even higher rates among pregnant teenagers is almost compatible with some previous observations in other countries [1, 8-11]. In some studies reported age-based estimates, younger participants had higher prevalence estimates than older participants associated with the cervical biological immaturity [12]. The previous reports showed that CT infection rates are highest among those < 25 years and are also consistent with sexual behavior data which show that numbers of sexual partners are highest in these younger age groups [13].

The data revealed that the rates of CT detection by the both CT nucleic acid detection tests with and without PCR differ significantly from those by the CT antibody detection tests. In an earlier study by Weill et al [14], sensitivity and/or specificity of CT antibody detection tests against CT nucleic acid detection tests have been reported to be not high enough. In an earlier study in Japan [15], it has been observed that CT antibodies will not be detected if CT infection is confined in the columnar epithelium of the uterine cervix. In addition, in our preliminary study [16], we found two cases with positive CT nucleic acid amplification tests in 97 pregnant women with negative CT antibody detection tests (2.1%). According to the guidelines for obstetrical practice in Japan [7], treatment with a single dose of oral azithromycin (1.0 g) or oral clarithromycin (200 mg × 2/day, 7 days) is required in the pregnant women with CT genital infection for the prevention of neonatal CT infection. However, the screening with CT antibody detection tests may increase the both risks of unnecessary antibiotics administration and no antibiotics administration in the women required antibiotics.

Therefore, Japanese obstetricians should perform CT nucleic acid detection tests from the uterine cervix of the pregnant women thoroughly.

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Table 1. Maternal Age Distribution Under the Three Chlamydia trachomatis (by Nucleic Acid Detection Tests With and Without Polymerase Chain Reaction and Antibody Detection Tests)

| Maternal age (years) | PCR test Number (%) | Nuclei acid tests except PCR Number (%) | Antibody tests Number (%) |
|----------------------|---------------------|----------------------------------------|---------------------------|
| 19                   | 5,370 (2.1%)        | 1,675 (2.2%)                           | 60 (2.1%)                 |
| 20 - 24              | 26,049 (10.4%)      | 8,224 (10.9%)                          | 374 (12.8%)               |
| 25 - 29              | 65,503 (26.1%)      | 20,814 (27.5%)                         | 792 (27.1%)               |
| 30 - 34              | 82,194 (32.8%)      | 25,131 (33.2%)                         | 1,015 (34.7%)             |
| 35 - 39              | 51,937 (20.7%)      | 15,217 (20.1%)                         | 573 (19.6%)               |
| 40                   | 13,190 (5.3%)       | 3,467 (4.6%)                           | 108 (3.7%)                |
| Total                | 250,571 (100%)      | 75,795 (100%)                          | 2,922 (100%)              |

PCR: polymerase chain reaction.

Table 2. Prevalence of Chlamydia trachomatis Screening Tests (by Nucleic Acid Detection Tests With and Without Polymerase Chain Reaction and Antibody Detection Tests) of the Study Population by Age

| Maternal age (years) | PCR test Positive/Positive rate (%) | Nuclei acid tests except PCR Positive/Positive rate (%) | Antibody tests Positive/Positive rate (%) |
|----------------------|-------------------------------------|--------------------------------------------------------|------------------------------------------|
| 19                   | 854/5,370 (15.9%)                  | 272/1,675 (16.2%)                                     | 15/60 (25%)                             |
| 20 - 24              | 1,953/26,049 (7.5%)                | 556/8,224 (8.0%)                                      | 66/374 (18.2%)                         |
| 25 - 29              | 1,533/65,503 (2.3%)                | 462/20,814 (2.2%)                                     | 96/792 (12.1%)                         |
| 30 - 34              | 965/82,194 (1.2%)                 | 347/25,131 (1.4%)                                     | 99/1,015 (9.8%)                        |
| 35 - 39              | 408/51,937 (0.8%)                  | 136/15,217 (0.9%)                                     | 57/573 (9.9%)                          |
| 40                   | 129/13,190 (1.0%)                  | 31/3,467 (0.9%)                                       | 15/108 (13.4%)                        |
| Total                | 5,880/250,571 (2.3%)              | 18,07/75,795 (2.4%)                                   | 348/2,922 (11.9%)                     |

PCR: polymerase chain reaction. *P = 0.055 vs. values with CT nucleic acid detection PCR tests by the X2 test. **P < 0.01 vs. values with CT nucleic acid detection PCR tests by the X2 test.

Declaration of Interest

The authors report no conflicts of interest. The authors are responsible for the content and writing of the paper.

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