Use of urine samples as controls for treatment of a *Chlamydia trachomatis* infection

*Chlamydia trachomatis* is the most common sexually transmitted bacterial pathogen worldwide. Because most infected individuals are asymptomatic, the actual number of reported cases represents only a fraction of the infected population. If left untreated, this silent infection can evolve, in women, into pelvic inflammatory disease or lead to infertility. Since the infection is easily and effectively treatable with antibiotics (e.g. doxycycline and azithromycin), detection and treatment of infected individuals is an important part of chlamydia control programs.

Nucleic acid amplification tests are an important advance in the field of *C. trachomatis* detection, and are now in routine use for the screening and diagnosis of *C. trachomatis* infections. These diagnostic assays can be performed with various specimens, including vaginal, endocervical and urethral swabs, and urine specimens. There is some debate, however, whether female urine specimens are sufficiently reliable for an optimal, sensitive diagnosis of a *C. trachomatis* infection (Van Doornum et al., 2001; Moncada et al., 2003; Gaydos et al., 2004). Urine collection is preferred for practical reasons, because it is non-invasive and much less burdensome for the individuals being tested than the other sample-collection methods. Urine samples might be suitable specimens for the monitoring of treatment efficiency.

Roosendaal et al. (1993) and Vogels et al. (1993) demonstrated that *C. trachomatis* DNA could be found in smears for up to 3 weeks after antibiotic treatment; this was probably caused by the presence of residual DNA or DNA from non-viable *C. trachomatis* organisms. In urine samples, Claas et al. (1991) and Bianchi et al. (1998) reported the clearance of *C. trachomatis* within 6 or 7 days post-therapy. However, there is no ‘gold standard’ for successful therapy.

The purpose of the present study was to evaluate whether a PCR assay for *C. trachomatis* in urine samples is a useful tool to study the response to treatment of a chlamydia infection. We asked general practitioners and the gynaecologists from our hospitals to send us first-catch urine (FCU) samples, from men and women, which were collected after the treatment of a *C. trachomatis* infection (the infection had been diagnosed earlier in our laboratories). Patients collected urine on the day they revisited their physician. The COBAS amplicor assay (Roche Molecular Diagnostics) was used to monitor the presence of *C. trachomatis* and thus the effectiveness of treatment.

One hundred and ten urine samples, one specimen per patient (35 male urine samples and 75 female urine samples), collected between 1 and 9 weeks after treatment, were tested with the COBAS amplicor assay. The results are shown in Fig. 1. Only seven of the 110 samples were positive during the entire observation period. Three urine samples were positive in the period 0–2 weeks after treatment. These samples were probably taken too soon after treatment. Four of the samples taken between 2 and 4 weeks after treatment were also positive. Although we can not completely exclude unsuccessful treatment, two of them were from patients with promiscuous conduct and one was from a patient with an untreated promiscuous partner, all suggesting reinfection. One sample (the only positive male urine, taken on day 18) had no clear indication of reinfection or ineffectiveness of treatment. Moreover, we could not completely rule out that the sample contained residual DNA from non-viable *C. trachomatis* organisms.

**Fig. 1.** Results of a nucleic acid amplification test for *Chlamydia trachomatis* on urine samples after treatment. Urine samples, collected after treatment of a *C. trachomatis* infection at the time points indicated, tested positive or negative in the COBAS amplicor assay. First-catch urine sample.
Such a sample might be negative in an assay for the detection of *C. trachomatis* RNA, as suggested by Morré et al. (1998).

In conclusion, our study on the monitoring of *C. trachomatis* infection showed that DNA detection in urine samples 2 weeks after treatment was negative, indicating successful treatment. One option for the few cases in which the sample remains positive 2 weeks after treatment would be to determine the presence of DNA again 4 weeks after treatment to exclude treatment failure or a reinfection with *C. trachomatis*.

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