

# A simple method for the detection of *Chlamydia trachomatis* infections in general practice

H.J. LONGHURST, MA, MB

N. FLOWER, MA, MB

B.J. THOMAS, BSc, PhD

P.E. MUNDAY, MD, MRCOG

A. ELDER, MRCGP

M. CONSTANTINIDOU, MRCP

J. WILTON, MRCGP

D. TAYLOR-ROBINSON, MD, FRCPath

**SUMMARY.** *Chlamydial infection is an important cause of genital tract disease in women and is often silent. Collection, storage and transportation of specimens required for culture pose problems which have made studies difficult and diagnosis impractical outside hospitals or sexually transmitted disease clinics. The direct monoclonal antibody test (MicroTrak, Syva) for detecting chlamydiae is comparable with the traditional culture method in sensitivity and specificity. The test requires only the preparation of a smear on a slide, making it convenient for use in general practice. The feasibility of using this procedure in an inner city practice was demonstrated in tests on 188 women who required pelvic examination. Of 169 women from whom valid specimens were obtained 18 (10.7%) were found to have a chlamydial infection. Only three of the infected women were asymptomatic and the organisms were associated particularly with dysuria. The value of the test in comparison with other procedures currently available for detecting chlamydiae is emphasized.*

## Introduction

**C**HLAMYDIA *trachomatis* organisms (chlamydiae) cause non-gonococcal urethritis in men and cervicitis and pelvic inflammatory disease in women sometimes resulting in ectopic pregnancies and infertility.<sup>1-3</sup> The traditional method of detecting chlamydiae has been isolation in cell culture<sup>4</sup> and this has made diagnosis slow and impractical outside hospitals and departments with appropriate facilities. In 1974, Fox<sup>5</sup> reported a study of so-called non-specific genital infection in general practice. Much of this was probably chlamydial but microbiological confirmation was not sought. Indeed, the requirements for

storage and careful transportation of frozen specimens to laboratory facilities inhibit those in general practice from seeking microbiological confirmation. Only three studies of chlamydial infection, backed by cultural confirmation, in women attending general practices have been carried out in the UK, two in inner city practices<sup>6,7</sup> and one in a suburban practice.<sup>8</sup> There are now, however, several chlamydial detection procedures<sup>9-11</sup> which do not require the use of cell cultures. In one of these, MicroTrak (Syva),<sup>9</sup> chlamydial elementary bodies are detected by a fluorescein-conjugated monoclonal antibody and the initial procedure involves only the preparation of a smear on a slide. This has made chlamydial diagnosis in general practice a more realistic proposition. This paper reports the feasibility of using this technique, based on experience of its use over a six-month period. The value of the technique relative to other non-cultural procedures is discussed.

## Method

### Study practice

The study practice is located in an inner city area of London and has a greater proportion of patients within social classes 1 and 5 than the average practice in the UK. At the time of the study 20% of the practice patients lived in over-crowded conditions, 17% belonged to minority ethnic groups and 13% were unemployed. The annual turnover of patients in the practice is 28% and 8% of consultations are with temporary residents, many of them students.

### Patients tested

Only women were tested because they are more susceptible than men to silent chlamydial infections and among women the opportunity for taking specimens is greater. Thus, over a period of six months all premenopausal women who required a pelvic examination and who had not received antibiotics in the preceding four weeks were included in the study whether asymptomatic or symptomatic. The asymptomatic women were attending for contraceptive surveillance or for screening for cervical dysplasia. The symptomatic women comprised three groups: (1) those with symptoms and/or signs of lower genital tract infection — vaginal discharge, pruritus, dysuria and/or superficial dyspareunia, (2) those with symptoms possibly attributable to an upper genital tract infection, such as abdominal pain and deep dyspareunia, and (3) those with menstrual disorders, including dysmenorrhoea. Details of age, marital status, parity, method of contraception and past history of urogenital infection were recorded for all the women.

### Detection procedure

After obtaining the patient's verbal consent, a cotton-tipped swab was inserted into the endocervix, rotated and then rolled over the marked area of the glass slide provided. The material was allowed to dry in air and then fixed with acetone. The slides were stored at 4°C for up to seven days before being transported to the laboratory where they were examined immediately or stored again at 4°C. Before examination the slides were brought to room temperature and the fixed material stained with a monoclonal antibody linked to fluorescein (MicroTrak) as

H.J. Longhurst and N. Flower, House Officers, General Practice, St Mary's Hospital, London; A. Elder, General Practitioner, M. Constantinidou, General Practitioner and J. Wilton, General Practitioner, Lisson Grove Health Centre; P.E. Munday, Consultant in Genitourinary Medicine, B.J. Thomas, Senior Research Officer and D. Taylor-Robinson, Consultant Microbiologist, Praed Street Clinic, St Mary's Hospital, London.

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described previously.<sup>9</sup> The presence of one or more typical elementary bodies detected by one observer (B.J.T.) using fluorescence microscopy was regarded as a positive result.<sup>9</sup>

Specimens for chlamydial culture were taken from a small sample of the women infected with *C. trachomatis* as judged by the direct smear test. Cervical swabs were expressed in sucrose-phosphate transport medium which was placed in liquid nitrogen and transported within 48 hours to the laboratory where the specimens were inoculated into cycloheximide-treated McCoy cell cultures and chlamydial inclusions sought as described previously.<sup>12</sup>

### Treatment

Women found to be infected with *C. trachomatis* were treated with a tetracycline or erythromycin for a minimum of seven days. They were advised to ask their sexual contacts to seek medical advice and were asked to return for assessment after two weeks.

### Results

Specimens were obtained from 188 women over the six-month period. Nineteen of these smears were either inadequate for testing by the fluorescent monoclonal antibody in that no cells were seen or they were too thickly spread for proper interpretation. However, 18 (10.7%) of the remaining 169 smears contained elementary bodies diagnostic of chlamydial infection. Specimens for chlamydial culture were obtained from four of the elementary body positive women and the specimens were positive when tested by this method.

Of the 169 women for whom a satisfactory smear test was carried out, 82 were asymptomatic and 87 were symptomatic. There was no significant difference between these two groups of women in terms of age, marital status, parity, method of contraception or past history of urogenital infection. However, whereas only three (3.7%) of the 82 asymptomatic women were chlamydia positive, 15 (17.2%) of the 87 women with symptoms were positive, a significant difference ( $P = 0.01$ ). There was no significant association between chlamydial infection and a particular symptom or sign, except for dysuria for which there was an association ( $P = 0.01$ ).

### Discussion

The main purpose of this study was to determine the feasibility of detecting chlamydiae in a busy practice by means of the MicroTrak test. Larger studies and studies in different types of practice will be required to examine the relationship of the organisms to disease. However, several points indicate that testing for chlamydiae is worthwhile. First, the detection rate of 10.7% cannot be ignored. It is slightly higher than the detection rate of 8% found by Southgate and colleagues<sup>6</sup> using a traditional culture technique in their study of chlamydial infection in 248 women in a similar practice. These infection rates are remarkable since the rates for women attending sexually transmitted disease clinics are only about twice as high.<sup>1</sup> As suggested by O'Dowd and colleagues,<sup>8</sup> the high prevalence of infection may be partially related to the general practice population, which in this study is typical of many inner city areas but different from that of the average practice.

In contrast to the large proportion of asymptomatic chlamydia positive women attending sexually transmitted disease clinics the majority of infected women in this study and that of Southgate and colleagues<sup>6</sup> were symptomatic. Dysuria in the presence of other symptoms of lower genital tract infection was more often associated with chlamydial infection than any other symptom. Women in this category comprised a selected group and the observation does not suggest that chlamydial infection is common in all women presenting with dysuria in general practice. It does suggest, however, that chlamydiae should be sought in women who complain of dysuria together with other lower genital tract symptoms.

If the need for testing exists, is the procedure adopted in this study the most suitable? The difficulties of taking, storing and transporting specimens for culture have already been pointed out. Such problems are diminished if specimens are examined by one of the commercially available enzyme immunoassays. Unfortunately, these are insufficiently sensitive or specific and their use cannot be advocated.<sup>11,13</sup> On the other hand, the MicroTrak test combines sensitivity with specificity<sup>9</sup> and in the surgery involves no more than the preparation and fixing of a smear on a slide. This means that transportation to a laboratory presents no problem. Furthermore, examination of the smear reveals whether an adequate specimen has been taken; this is an opportunity that is not afforded by other procedures. The MicroTrak test also lends itself to the examination of single specimens whereas other methods are only cost effective if batches of specimens are tested. The only drawback to the MicroTrak test is the need for expertise in reading the slides. It would be over-optimistic to suggest that this might be achieved routinely in the surgery, but in large group practices it could be carried out by an adequately trained nurse and would become more cost effective if other microbiological tests were developed along similar lines. In this situation, a chlamydial result could be obtained and acted upon within 30 minutes of a specimen being taken, an attractive proposition which should enhance the use of the test. This could help to reduce the morbidity from untreated chlamydial infection and facilitate larger studies of this neglected field in general practice.

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### Address for correspondence

Dr D. Taylor-Robinson, Clinical Research Centre, Division of Sexually Transmitted Diseases, Watford Road, Harrow, Middlesex HA1 3UJ.