Detecting *Chlamydia trachomatis* by direct immunofluorescence using a Cytobrush sampling technique

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SUMMARY We compared two different methods of collecting endocervical samples for examination by direct immunofluorescence for *Chlamydia trachomatis*. A cervical Cytobrush gave better results than a dacron swab. Further studies should be performed to assess the value of alternative sampling methods to detect this organism.

Chlamydiae are now commonly detected in genital tract specimens in routine diagnosis by direct immunofluorescence. Direct immunofluorescence is as sensitive and specific as conventional culture.¹ Studies in our laboratory also suggest that direct immunofluorescence may be a valuable test for cure.²

One of the problems encountered with direct immunofluorescence, as with culture, is the need for proper specimen collection and the ability to obtain endocervical cells for analysis.³ Phillips and colleagues found that the number of cells present on the slide affected the direct immunofluorescence test results, and improved sensitivity was found when more endocervical cells were present.⁴ A swab is generally used to collect cervical material for analysis with direct immunofluorescence. Another device, the cervical Cytobrush (International Cytobrush, Hollywood, Florida, USA), has been used successfully at this school of medicine for performing Papanicolaou smears and has also been found by Ros *et al* to be superior to swab collection of endocervical cells for cytopathological analysis.⁵ Because of its abrasive surface, the Cytobrush might also be better at disrupting the infected cells present in cervical secretions and thus improve chlamydial detection. As part of studies of chlamydial infections in our family planning clinic,² we studied the use of the Cytobrush as a collection device for diagnosing chlamydial infection, and we compared it with swab collection.

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Patients and methods

We studied women aged 15 to 19 who attended the family planning clinic of the hospital of the University of Pennsylvania for routine gynaecological examination. In the first phase of the study, samples for chlamydial detection were collected using the MicroTrak collection device (MicroTrak, Syva Company, Palo Alto, California). This collection kit contains a glass slide for smear preparation, a dacron swab for sample collection, and fixative. In the second phase of the study, a Cytobrush (International Cytobrush, catalogue No 166100) was substituted for the dacron swab. The Cytobrush has a plastic shaft with nylon bristles arranged in a spiral at one end. In both phases, we collected endocervical cells in an identical fashion.

Statistical analysis of data was performed using Yate's corrected χ^2 analysis.

Results

In phase one of this study, of 103 consecutive samples taken using the MicroTrak swab as the collection device, 73 (71%) contained sufficient endocervical material for analysis. In phase two 88 (63%) of 139 patients sampled with the Cytobrush yielded adequate samples for analysis. The difference between the sampling efficiency of each group was not significant ($\chi^2 = 1.197$; $p < 0.3$).

The table summarises the results of direct immunofluorescent of the adequate samples from both phases of the study. In phase one the percentage of positive samples was 12% compared with 27% in

Table Detection of *Chlamydia trachomatis* in 161 endocervical samples using two different collection devices

Method of collection	Direct immunofluorescence result		
	Positive	Negative	Total
MicroTrak swab	9	64	73
Cytobrush	24	64	88
Total	33	128	161

phase two. The difference in detection in the two phases was significant ($\chi^2c = 4.61$; $p < 0.05$).

Discussion

We found that the use of the Cytobrush more than doubled the detection of chlamydiae. This increase, however, did not appear to be caused by an overall improvement in sample adequacy, as the proportions of negative results in both phases of the study were similar (88% in phase one, 73% in phase two). Sampling with the brush was possibly better, though we did not count the number of endocervical cells present on the slides to make this comparison. The Cytobrush is more abrasive than a dacron swab and may have caused greater disruption of infected cells, thus improving positivity.

Although this was not a randomised study and the number of patients studied was relatively small, we do not believe that the different positivity in the two phases can be attributed to differences in the population or to a spontaneous increase in chlamydial infection. Both groups of patients were of the same socioeconomic class and age as those routinely seen for gynaecological examination. During the same period as the study, the overall clinic incidence of

gonococcal infection was similar (4% in both phases). In addition, the incidence of gonococcal infection was similar (6%) in each group of patients.

Although the brush appeared to improve chlamydial detection, we did encounter problems with its use. In general, we rejected more samples obtained with the Cytobrush than with the swab because of the presence of gross blood. In addition, cervical bleeding was more a problem with the brush than with the swab device. On occasion, however, positive samples may be detected in the presence of gross blood. Under this circumstance, the results should be reported as being positive and are acceptable for evaluation.

Our findings suggest that additional randomised studies should be performed to assess the usefulness of the Cytobrush in improving the diagnosis of chlamydial infection.

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AIDS were positive for antibodies to HIV-I compared with only 1/27 wives of seronegative controls.² Another study undertaken in Kinshasa showed that of 3000 couples tested, in 80 cases the male partner was infected, and in only 20/80 (25%) cases were both spouses infected.³ The high rate of infectivity in the first Zaïrian study was probably because all the men had AIDS, whereas in the second study, as well as in ours, the subjects were clinically healthy.¹

The incidence of heterosexual transmission that we report in the present survey is higher than in wives of men infected through blood products. Several hypotheses may explain this finding. In Africa, chronic stimulation of the immune system is more common than in American heterosexuals, thus possibly increasing the number of target cells that the virus can infect.⁴ More

specifically, the high prevalence of sexually transmitted diseases in Africa, particularly genital ulcers, may facilitate the transmission of HIV.^{1,5} Finally, young African women may be more sexually active and thus at increased risk of infection.

This study highlights the need for prospective studies to assess more accurately the efficiency of heterosexual transmission of HIV and the possible role of cofactors in the spread of the disease.

Yours faithfully,

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Notices

First congress of the European Academy of Dermatology and Venereology

The first congress of the European Academy of Dermatology and Venereology, for continuing education, will be held on 25-28 September 1989.

Topics will include: AIDS and dermatologists, what's new in treatment, dermatological surgery, warts and viruses, cutaneous histopathology, cutaneous immunopathology, and contact dermatitis.

For further information, please contact Centro Servizio Segreteria, EADV, Via Lapini 1, 50136 Florence, Italy.

Conference on vaccines for sexually transmitted diseases

A conference on vaccines for sexually transmitted diseases will be held on 5-7 April 1989 at Oxford University. It is sponsored by the journal, *Vaccine*, and the World Health Organisation.

For further information, please contact DE Cogan, Vaccines for Sexually Transmitted Diseases, Butterworth Scientific Ltd, PO Box 63, Westbury House, Bury Street, Guildford, Surrey, GU2 5BH (Tel. 0483 300966).

8th Meeting of the International Society for Sexually Transmitted Disease Research (ISSTD)

The 8th meeting of the ISSTD will be held on 10-13 September 1989 in Copenhagen, Denmark.

For further information please contact the meeting organisers: DIS Congress Service, Linde Allé 48, DK-2720 Vanløse, Copenhagen, Denmark or the scientific secretariat (Mrs Sandra Hyman), Statens Serum-institut, Neisseria Department, DK-2300 Copenhagen S, Denmark.

Correction

Detecting *Chlamydia trachomatis* by direct immunofluorescence using a Cytobrush sampling technique (August 1988;64:245-6)

We regret that an error occurred in the above paper. The second sentence of the first paragraph should have read:

"Direct immunofluorescence is adequately sensitive and specific compared with conventional culture."