

BRIEF REPORT

Pilot study to assess the presence of *Chlamydia trachomatis* in urine from 18–30-year-old males using EIA/IF and PCR

Adriana Basarab, MRCP, MRCPATH, *Consultant Medical Microbiology*; **David Browning**, AIBMS, *Medical Laboratory Scientific Officer*; **Stuart Lanham**, MSc, PhD, *Researcher*; **Susan O'Connell**, LRCPSI, DipClinMicro, *Associate Specialist in Medical Microbiology*, Southampton General Hospital, Southampton, UK

Correspondence: Dr Adriana Basarab, Public Health Laboratory, Level B, Laboratory and Pathology Block, Southampton General Hospital, Southampton SO16 6YD, UK. Email: Adriana.Basarab@suht.swest.nhs.uk

(Accepted 4th August 2001)

The Journal of Family Planning and Reproductive Health Care 2002; **28**(1): 36–37

Abstract

Context. To increase detection, urine samples from young males could be opportunistically tested for *Chlamydia trachomatis*.

Objective. To determine *C. trachomatis* prevalence in urine, optimum specimen and compare sensitivity/feasibility of routine use of different testing methods.

Design. Group A, 'sterile' pyuria samples June 1998–January 1999, tested by enzyme immunoassay (EIA) and, if reactive, by immunofluorescence (IF). Subsequently batch-tested by polymerase chain reaction (PCR). Group B, consecutive urine samples October 1998–January 1999; batch-tested by PCR.

Setting. Microbiology laboratory.

Samples. From males aged 18–30 years; group A = 71, group B = 83.

Main outcome measures. *Chlamydia trachomatis* positive if EIA- and IF- or PCR-positive.

Results. Group A: 12 EIA/IF-positive; 9/12 and 15 EIA-negative samples PCR-positive. Group B: 11 PCR-positive; 8/11 showed 'sterile' pyuria.

Conclusions. Opportunistic testing of urine from young men shows a significant number of *C. trachomatis* infections. 'Sterile' pyuria samples are optimal. EIA/IF are less sensitive than PCR but can be routinely performed and detect a significant proportion of cases.

Introduction

Chlamydia trachomatis infection can cause significant morbidity and any strategy that can increase detection rate should be exploited. Recent emphasis has been on screening women,¹ however urine samples from young males could be readily utilised for opportunistic testing.² We set out to assess *C. trachomatis* prevalence in urine samples sent routinely to our laboratory from males in the highest risk (18–30 years old) group, and to determine which type of specimen gave the greatest yield of positive results. It was assumed that medical consultation with submission of a urine specimen was a request to identify any significant pathogens. We aimed to compare our routine antigen detection methods [enzyme immunoassay/immunofluorescence (EIA/IF)] with polymerase chain reaction (PCR), which although regarded as having greater sensitivity requires batch testing and is significantly more expensive.

Methods

Between June 1998 and January 1999, 71 'sterile' pyuria samples (>20 white cells/mm³ plus negative routine bacterial culture) from males aged 18–30 years (group A) were processed further by EIA for *C. trachomatis* antigen detection (MicroTrak[®] II). Sixty-two (87%) samples had clinical details of urinary tract symptoms or abnormal dipstick analysis. Fifty-one (72%) samples were received from general practitioners (GPs) and 17 (24%) from hospital inpatients. Samples weakly or clearly positive were further tested by IF (MicroTrak[®]). Samples were then stored at –20°C. Referring clinicians were telephoned about specimens that were EIA- and IF-positive. Ideal follow-up was discussed, i.e. endourethral samples for *C. trachomatis*, screening for other sexually transmitted diseases (STDs) and need for contact tracing; referral to the genitourinary medicine (GUM) clinic was advised. PCR was performed on the 71 stored undiluted samples using the ABI PRISM 7700 Sequence Detection System (PE Applied Biosystems, Warrington, UK). Samples that were PCR-negative but EIA +/- IF-positive were re-tested at a 1:10 dilution to reduce the effect of urine PCR inhibitors. PCR was also performed on 83 consecutive unselected urine samples from 18–30-year-old males collected between October 1998 and January 1999 (group B). Fifty-seven (69%) samples were received from GPs and 17 (21%) from hospital inpatients. Sixty-nine (83%) samples had clinical details of urinary tract symptoms and 24 (29%) showed 'sterile' pyuria.

Results

EIA and IF were positive for 12/71 (17%) patients. PCR detected 15/71 (21%) further positive urine samples, increasing the total yield to 27/71 (38%). However, three samples positive by EIA/IF were PCR-negative and five samples were only PCR-positive after being re-tested at a 1:10 dilution, consistent with the presence of PCR inhibitors. Eleven (13%) of the 83 group B samples were PCR-positive; eight of these (73%) demonstrated 'sterile' pyuria.

Discussion

Although recent emphasis has been on screening women, urine samples from males aged 18–30 years can be readily

tested opportunistically for *C. trachomatis*. Although EIA/IF may have reduced sensitivity compared to PCR,³ our laboratory staff are experienced with these techniques and results are available on a same-day basis. Following this procedure, 17% of group A samples were found to be *C. trachomatis*-positive, three samples of which would have been missed by PCR alone. Furthermore, results are delayed with PCR as specimens are batch-tested for increased cost-effectiveness and inhibitors present in urine⁴ can lead to false-negative results unless diluted out. PCR detected *C. trachomatis* in 13% of group B urine samples (most showing 'sterile' pyuria) compared to 34% of group A urine samples, suggesting that resources are best deployed in testing 'sterile' pyuria samples. These results also suggest that *C. trachomatis* infection should be strongly considered in young men whose urine samples show 'sterile' pyuria. However, as 2/83 group B samples from symptomatic men without pyuria were PCR-positive, it is a further reminder that *C. trachomatis* should be considered in any young male complaining of dysuria.

Based on the present results we have introduced *C. trachomatis* EIA/IF testing of 'sterile' pyuria samples from

young men aged 18–30 years as a routine laboratory investigation.

Conclusions

Opportunistic testing of 'sterile' pyuria samples from young men for *C. trachomatis* shows a significant yield of positive results that may otherwise have remained undetected. Although PCR is more sensitive than EIA/IF, the results may be delayed through batch testing, the procedure cannot be routinely performed in all laboratories, and it is significantly more expensive.

Statements on funding and competing interests

Funding. None declared.

Competing interests. None declared.

References

- 1 Duncan B, Hart G. Sexuality and health: the hidden costs of screening for *Chlamydia trachomatis*. *BMJ* 1999; **318**: 931–933.
- 2 Sanders JW, Hook EW, Welsh LE, et al. Evaluation of an enzyme immunoassay for detection of *Chlamydia trachomatis* in urine of asymptomatic men. *J Clin Microbiol* 1994; **32**: 24–27.
- 3 Black CM. Current methods of laboratory diagnosis of *Chlamydia trachomatis* infections. *Clin Microbiol Rev* 1997; **10**: 160–184.
- 4 Tøye B, Woods W, Bobrowska M, et al. Inhibition of PCR in genital and urine specimens submitted for *Chlamydia trachomatis* testing. *J Clin Microbiol* 1998; **36**: 2356–2358.