

ORIGINAL ARTICLE

Diagnosis of genital chlamydia in primary care: an explanation of reasons for variation in chlamydia testing

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Objectives: To explore the reasons for the 40-fold variation in diagnostic testing for genital *Chlamydia trachomatis* by general practices.

Methods: A qualitative study with focus groups. We randomly selected urban and rural high and low testing practices served by Bristol, Hereford, and Gloucester microbiology laboratories. Open questions were asked about the investigation of *C trachomatis* in men and women in different clinical contexts.

Results: The high and low testing practices did not differ in their age/sex make-up or by deprivation indices. There were major differences between high and low chlamydia testing practices. Low testing practices knew very little about the epidemiology and presentation of genital chlamydia infection and did not consider it in their differential diagnosis of genitourinary symptoms until patients had consulted several times. Low testers were less aware that chlamydia was usually asymptomatic, thought it was an inner city problem, and had poor knowledge of how to take diagnostic specimens. High testing practices either had a general practitioner with an interest in sexual health or a practice nurse who had completed specialist training in family planning. High testing practices were more cognizant of the symptoms and signs of chlamydia and always considered it in their differential diagnosis of genitourinary symptoms, including patients attending family planning clinics.

Conclusions: Any programme to increase chlamydia testing in primary care must be accompanied by an education and awareness programme especially targeted at low testing practices. This will need to include information about the benefits of testing and who, when, and how to test.

The 2001 UK national sexual health strategy proposed a comprehensive framework for promoting good sexual health with an increased role of primary care in service delivery, which will include diagnostic testing for chlamydia.¹ The proposed national roll-out of chlamydia screening is commencing with an initial pilot at 10 sites providing specialist sexual health services.² Although general practitioners (GPs) are not actively involved in this initial stage, GP pilots have demonstrated that screening in primary care is a particularly effective strategy.³

Laboratory audit of GPs' laboratory use within the south west public health laboratories has shown a 40-fold variation in submission of chlamydia tests. Despite guidance^{4,5} suggesting that GPs should test sexually active women with vaginal discharge for chlamydial infection, the audit found that only 44% of 16–25 year old women in Gloucestershire and Herefordshire who had a high vaginal swab sent to the microbiology department also had a specific swab for *Chlamydia trachomatis*. Moreover, 70% of chlamydia test submissions were in women over 25 years of age who are known to be at lower risk of infection. In this study we used qualitative approaches to explore GPs' and practice nurses' awareness of genital chlamydia infection and determined differences in the strategies used by high and low testers of *C trachomatis* in rural and urban areas in England.

METHODS

This qualitative research was essentially exploratory, aimed at obtaining information from all members of the primary healthcare team about their genital chlamydia management strategies in genitourinary and sexual health.

Participants and recruitment

We recruited general practices served by the Bristol, Gloucester, and Hereford microbiology laboratories, which

represent urban and rural communities in the South West Region. Practices in Bristol that were involved in the Health Technology Assessment (HTA) study of different chlamydia testing methods were excluded, as these would not be typical of most UK general practices. Laboratory data and practice population data from April 2000 to March 2001 were used to determine GP requests/1000 patients for *C trachomatis* testing (range 0.6–23/1000 population/year). As there was significant geographical heterogeneity in test submission the practices in each locality were stratified into rural or urban and then ordered by number of chlamydial specimens sent to each laboratory per 1000 practice population (table 1). Practices in the highest and lowest 10 percentiles were randomised and approached, initially by telephone and then by letter, in order from these lists, with representation from each laboratory locality. This resulted in four strata (rural high and low testers, urban high and low testers). Twelve of 15 practices that were approached agreed to take part. Within a practice, all healthcare staff who may be involved in the management of chlamydia were invited to take part in a focus group, including practice managers, GPs, practice nurses, midwives, and district nurses. At every focus group at least one nurse participated and in the larger practices there were two or three nurses. Each focus group only consisted of staff from a single practice; therefore the focus groups varied in size from two (a single handed GP and nurse) to eight (four GPs, two practice nurses, district nurse, and midwife). At the focus group visit practices were asked for their practice age/sex breakdown. Townsend deprivation scores were similar and there was no significant difference in the percentage of 17–24 year olds in high and low testing practices (table 1).

Development of topics for focus groups

A group of microbiologists, GPs, epidemiologists, and gynaecological clinicians developed a series of open questions

Table 1 Genital chlamydia testing rate and characteristics of the focus group practices

Site	High testing practices						Low testing practices					
	Urban			Rural			Urban			Rural		
	A	B	C	D	E	F	G	H	I	J	K	L
Chlamydia specimens submitted/1000 patient population	20.8	13.6	23.3	9.5	8.1	9.8	1.4	4.2	2.05	0.6	2.4	1.9
Training practice Y/N	N	Y	N	N	N	Y	Y	N	N	N	N	N
Townsend deprivation score*	-0.22	4.48	1.13	-3.69	-0.18	-1.42	4.69	2.37	-1.41	0.65	-0.41	0.48
2001 Census, ONS General Health.†	10.8	10.2	8.0	9.7	9.2	7.4	10.6	10.2	0.4	11.4	8.2	8.1
Percentage of resident population whose health "Not good in previous year"												

*Most deprived: +; most affluent: -.

†Mean: Bristol, 10.6%; Hereford, 9.5%; Gloucester, 8.2%.

about diagnosis, testing, and management of genital chlamydia within the practice setting for symptomatic and asymptomatic patients. Questions were also asked in relation to testing asymptomatic patients, particularly women attending for cervical screening and family planning services. Practices were asked about their staff training, expertise, and interest in STIs and whether they provided specific cervical screening, family planning, and well men or women clinics. All practices were asked whether they thought they were testing appropriately and what would encourage them to send more specimens.

Conduct of focus groups

Twelve focus groups were held in the practice premises between April and August 2002. Practices were informed of their sampling rate and the purpose of the study at the beginning of the focus group. The focus groups were moderated by a researcher with extensive qualitative research experience (EF) and observed either by a microbiologist (CMcN 6), an obstetrics and gynaecology registrar (JS 4), or other researcher (JB 2). At the end of each focus group the points raised were summarised by the moderator (EF) and verified by the group. Following the focus groups the practices were presented with UK guidance on the management of chlamydia.⁴⁻⁶ Notes of key issues raised and non-oral signals were made by the observer (during the focus groups) and by the moderator (immediately after the focus groups). Focus groups were tape recorded. Memos were used to capture pertinent issues after listening to the tape recordings. These data were appended to the transcripts for further analysis.

Ethics approval

Ethical approval was obtained from the local research ethics committees in each area (Gloucester No 01/152G, Hereford No C7b(i), Bristol No E5241). All participants gave written informed consent for the focus groups to be tape recorded and transcribed.

Data analysis

Data were collected and analysed concurrently until saturation occurred.⁷ All the tapes were transcribed and data checked by listening to the tapes for accuracy by the moderator (EF). These transcribed data were analysed using a modified grounded theory approach utilising the constant comparative method.^{7,8} The transcripts were scrutinised independently (by EF and CMcN). A number of major themes and ideas emerged from the data, which were discussed and confirmed by the research team. A coding

frame was developed which identified common codes, categories, and themes that explored the differences in sampling rates and the management strategies of the participants. Themes raised in the different focus groups were compared and contrasted as an iterative process. A high level of consensus was achieved between research team members in interpreting the data. Saturation of data occurred relatively quickly and the last four focus groups served to enrich the data.

RESULTS

There were major differences between high and low chlamydia testers (table 2). This included their knowledge of chlamydia and sexual health, threshold for testing for chlamydia in men and women, their staff training, and information available for patients.

Threshold for testing for chlamydia

The threshold for testing for chlamydia in women with vaginal discharge was very different between low and high tester practices. The low tester practices did not consider testing for chlamydia until women had re-consulted several times and after bacterial swabs were reported to be negative. In contrast, high testers always considered chlamydial infection in women with genitourinary symptoms and routinely sent a chlamydia swab whenever they took a high vaginal swab. All primary care staff were less confident in their management of men presenting with genitourinary symptoms. All low testers referred men directly to the GUM clinic. High testers were more likely to manage men with dysuria but thought they were unable to test for the full range of STIs and had no resources to do any contact tracing. Practices were unable to check whether patients attended the GUM clinic, as anonymity of GUM clinics usually meant that even if a letter of referral was sent with the patient no correspondence was returned. Practices felt that this lack of communication placed a barrier between GUM and primary care services.

Awareness of chlamydia and sexual health issues

Low testers knew very little about the epidemiology and presentation of chlamydia infection and did not consider testing for chlamydia in women with genitourinary symptoms attending routine appointments or for a family planning check or cervical smear. Low testers did not know that chlamydia was an intracellular organism and all staff were unsure how to take an endocervical swab. Many low testers believed that chlamydia tests were inaccurate when taken after a cervical smear.

Table 2 Chlamydia testing strategies in high and low testing practices

	High testing practices	Low testing practices
Clinical scenarios when testing may be appropriate in at-risk groups		
Opportunistic chlamydia swab taken with high vaginal swab	Always	Rarely
Investigation of intermenstrual or cervical bleeding	Considered chlamydia	Rarely considered chlamydia
Opportunistic chlamydia swab taken with cervical smear	Considered chlamydia	Never considered chlamydia
Men with urethritis	Considered chlamydia	Referred to GUM
Awareness and training in chlamydia and sexual health		
Staff aware of symptoms and signs of chlamydia	Yes	No
Staff aware that chlamydia is often asymptomatic	Yes	No
Family planning trained nurses in practices	Yes	No
Perception of prevalence of chlamydia in practice population	Chlamydia present in their population	Chlamydia only an inner city problem

High tester practices either had a GP staff member with an interest in sexual health or practice nurses who had completed specialist training in family planning (four of the six high testing practices had both). In contrast, only two of the low testers had a staff member with an interest in sexual health and these were both new to their practices. High tester practices were more likely to have patient information leaflets on genital chlamydia infections. Even so, only four of the 12 practices (three high testers) had patient information leaflets on chlamydia infection.

Perception of chlamydia prevalence in the catchment population

The low testing practices felt that their practice population had a low number of patients in the age group at risk of chlamydia. Although these practices perceived that their practice population was elderly, with low numbers of young adults, statistical analysis of their age, sex, and population data did not show a significant difference from high testers

(Mann-Whitney U test comparing percentage of 17–24 year age groups $p = 0.57$). Four of the six low testing practices also felt that their practice population was not at risk of chlamydial infection, which was perceived as an inner city problem. As they had such a low testing rate, the low tester practices had very few positive results and they used this as evidence that their practice population was at low risk. High testers were aware that patients in their practice were at risk of chlamydia. Their testing policy meant they received positive results and this further reinforced their awareness of risk groups and value of testing for chlamydia in the primary care setting.

Threshold for testing for chlamydia

- Low testers: “What I tend to do is an ordinary high vaginal swab when I think there may be some infection and if that’s negative and they have still got symptoms then I think about chlamydia..... so I don’t do very many at all..... Its got to be sort of recalcitrant really for me to think of a chlamydia.” (Doctor, low testing rural practice L)
- “I don’t think, I hardly ever do screening for chlamydia.....it just doesn’t occur to me.” (Nurse, low testing rural practice K)
- High testers: “I mean my philosophy is that any sexually active woman who comes in complaining of a vaginal discharge, intermenstrual bleeding, dyspareunia or anything like that I do a high vaginal swab and chlamydia at the same time and I suspect everybody of having chlamydia until we prove otherwise if they have a problem and they are sexually active.” (Doctor, high testing urban practice C)

Testing in men

- High and low testers: “Well I’ve got a mental block with men. If they come with a urethral discharge I think they should probably be in a GU clinic. Women is slightly different, we know chlamydia is diagnosable.” (Doctor, high testing rural practice F)

Awareness of chlamydia and sexual health issues

- Low testers: “I was under the impression that if you took a [chlamydia] swab you disturbed the cells for the [cervical] smear and conversely if you did a smear you weren’t as likely to pick up chlamydia on the swab. If you have already smear tested and quite often maybe they bleed or something like that after you have taken the smear I have been under the impression that to then try and do a chlamydial swab is not going to be as accurate.” (Nurse; low testing rural practice L)
- “I would just like to know how to do it, to be actually shown.” (Nurse, low testing rural practice H)
- High testers: “Others just come in with non-specific discharge or lower abdominal pain and others bleeding on the pill or have post-coital bleeding. I tend to swab all of those for chlamydia.” (Nurse, high testing urban practice A)
- “I did a study day for cervical cytology and we were asked then how many [performed] routine smears for chlamydia. We were told you should be doing it. If we did a high vaginal swab we should be doing [a swab] for chlamydia. So I think the emphasis is on doing more.” (Nurse, high testing urban practice C)

Availability of patient leaflets

- Interviewer: Do you have any patient leaflets covering this area? Respondent: “The computer actually, you just put in the word chlamydia and it will come up with [a patient information leaflet], I think it comes up with [a leaflet about] women with chlamydia.” (High testing rural practice D)

Perception of chlamydia prevalence in the catchment population

- Low testers: "I mean, we have the highest percentage of elderly and we have the lowest of the 15–24 year age group.....that sort of older adolescents and your chlamydia age group we have far less than average on population scales." (Doctor, low testing rural practice J)
- "I suppose we are sceptical a little. I am a bit sceptical of research, which I always feel has come out of inner city family planning clinics where there is a very high incidence of sexual disease. I wonder how much that has been based in a similar population of a rural area." (Doctor, low testing rural practice K)
- "I find this sort of slight problem with it, you read the papers and they have a much higher percentage of people who are positive than us, its very rare to get positives back and eventually, over time, I am sure that it does have an effect on testing. Is it really worth all this?" (Doctor, low testing urban practice G)
- High tester: "I suppose also seeing a high pick up rate, I mean if every time you send one off it came back positive you would be more likely to send off more than if you rarely got a positive." (Doctor, high testing rural practice D)

DISCUSSION

This study confirmed the wide variation in chlamydia testing and the lost opportunity in some practices to reduce morbidity caused by this infection within general practice.⁹ There was clear evidence of differences in professional awareness about the natural history, clinical presentation, and epidemiology of genital chlamydia. Low testing practices had little knowledge of who and when they should be testing.

Evidence based clinical practice is highly dependent upon staff awareness, training, confidence, and possession of the appropriate skills to undertake the work. Our study indicated that staff from high testing practices had attended either continuing education sessions about chlamydia or had received specialist family planning training or had an interest in sexual health. If we are to detect more chlamydia infections in primary care, practices that have a low testing behaviours will need to be identified within the framework of continuing medical education, continuing professional development, and clinical governance.

UK guidance on the management of genital infections recommends diagnostic testing should be performed in women with symptoms and signs suggestive of *C trachomatis*.^{4,5} This includes vaginal discharge and post-coital, intermenstrual, and breakthrough bleeding. The high testing practices were aware of chlamydial infection and were testing appropriately in symptomatic women. However, our routine laboratory data indicate that only 44% of women under 25 years who have a high vaginal swab sent to the laboratory for genitourinary symptoms also have a chlamydia swab. We should be encouraging GPs always to take an endocervical swab for chlamydia when taking a high vaginal swab. The routine addition of a comment "have you considered chlamydia" on genital swab bacteriology laboratory reports in the at risk age group may help to reinforce the message.

Few practices tested men for chlamydia. A delay in the investigation and treatment of symptomatic men occurs as most are often referred directly to GUM clinics. This may not be considered ideal management, as waiting times for GUM

clinics are extending which increases the possibility of further cross infection in the target population. Furthermore, because of desire by GUM clinics to maintain patient confidentiality, GPs have no way of knowing whether patients attend, as they often received very little, if any, correspondence about patients referred to GUM clinics. This lack of communication contributes to the lack of knowledge about STIs by primary care staff, as such correspondence has an educational role. In the 21st century surely it is time to break down this confidentiality barrier and, with patients' permission, write to the primary carer? These issues need to be addressed during the implementation of the sexual health strategy.

The heterogeneity in chlamydia testing that currently exists across GP practices is partly due to the lack of insight by practices of their own testing behaviours. Laboratory use figures are not made available routinely to practices, unlike antibiotic use.¹⁰ This study underscores the importance of having good performance measures so that practices are aware of where they lie on the normal distribution of testing patterns and whether they test in the appropriate at risk age group.

In a qualitative study of patients, most women recently diagnosed with genital chlamydial infection had not previously perceived sexually transmitted infections as being personally relevant.¹¹ This is mirrored by the perceptions of healthcare staff in our low testing practices who felt that their patients were not at risk of chlamydial infection. These perceptions of risk will need to be addressed if we hope to increase testing within primary care as *C trachomatis* infection is broadly distributed geographically and by age, sex and behaviour group.^{12,13}

Strengths and weaknesses of this qualitative research

The data generated are from a much smaller sample than is possible from quantitative research, but the sampling strategy used meant that the findings may be considered to be representative of rural and urban general practices under similar pressures. The open questioning style revealed attitudes to chlamydia infection that have not been ascertained from previous questionnaire surveys. It was possible to explore in considerable depth the reasons why tests are performed and attitudes towards testing. By selecting practices at the extremes of the testing distribution we may have selected practices which are atypical in other ways. However, as we randomly selected practices we have avoided any systematic error in their selection within these broad groups. The testing data were for the whole practice; therefore data from large practices may have masked individual variations in practice that we were not able to explore. However, individuals were able to express their own practice beliefs and knowledge of sexual health and testing strategies. Qualitative data can be observer biased. However, the moderator was aware of the importance of not influencing participants' responses and was not a microbiologist or sexual health specialist.

Implication for sexual health policy and planning

The Department of Health has announced the roll-out of the chlamydia screening programme across the United Kingdom.^{2,14} Although screening is currently concentrated in GUM and family planning clinics, testing in general practice is planned in the future. Any moves to roll-out sexual health service provision in primary care must be accompanied by adequate investment in human and capital infrastructure to support this work. This funding must include continuing education about the prevalence, pathophysiology, epidemiology, and most appropriate diagnosis of chlamydia. Low testing practices will need to be targeted specifically in any

Key messages

- Lack of staff awareness and training in STIs is a major contributing factor to low chlamydia testing in primary care
- The roll-out of the sexual health strategy must be accompanied by adequate investment in education and human and capital infrastructure to support the work
- Practices are unaware of their testing rates compared to others in the primary care trusts (PCTs). With PCTs, laboratories should provide performance measures with data on testing rates by age, sex, and practice
- Lack of communication from GUM clinics contributes to the lack of knowledge about STIs by primary care staff

strategy and this laboratory use data gathering exercise will also need resourcing.

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CONTRIBUTORS

CM led the study group in all areas, observed six focus groups, scrutinised transcripts and interpreted data, and wrote the paper; EF moderated the focus groups, scrutinised transcripts, interpreted and analysed data, and helped to write the paper; JB presented the laboratory and population data, observed two focus groups, and commented on the paper; JS observed four focus groups, helped develop questions for the focus groups, and commented on the paper; KF gave substantial input into the study design, focus group question development, interpreting data, and writing the paper. There was no external funding. This study was funded by the PHL South West Group.

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REFERENCES

- 1 **Department of Health**. *The national strategy for sexual health and HIV*. London: DoH, 2001. Available at www.dh.gov.uk/assetRoot/04/05/89/45/04058945.pdf, accessed 17 April 2004.
- 2 **Department of Health**. *Sexual, health and HIV strategy: chlamydia screening*. Letter to Chief Executives of Health Authorities and Primary Care Trusts. 17 December 2001. www.dh.gov.uk/assetRoot/04/01/41/63/04014163.pdf, accessed 17 April 2004.
- 3 **Pimenta JM**, Catchpole M, Rogers PA, *et al*. Opportunistic screening for genital chlamydial infection: acceptability of urine testing in primary and secondary healthcare settings. *Sex Transm Infect* 2003;**79**:16–21.
- 4 **Scottish Intercollegiate Guidelines Network**. Management of genital Chlamydia trachomatis infection. Scottish Intercollegiate Guidelines Network (SIGN) 2000 No 42. www.sign.ac.uk/guidelines/fulltext/42/index.html, accessed on 17 April 2004.
- 5 **UK National Guidelines on Sexually Transmitted Infections and Closely Related Conditions**. Clinical Effectiveness Group, Association for Genitourinary Medicine (AGUM) and Medical Society for the Study of Venereal Diseases. *Sex Transm Infect* 1995;**75**(Suppl 1):S4–8 (www.mssvd.org.uk and www.agum.org.uk/PDF/CEG/S2fortintro.PDF, accessed 17 April 2004). Revised 2002: *Sex Transm Infect* 2002;**78**:81–2.
- 6 **HPA**. Chlamydia guidance available at www.hpa.org.uk/infections/topics_az/primary_care/chlamydia_guidelines_111203.rtf, accessed 17 April 2004.
- 7 **Morgan DL**, Kreuger R. *The focus group kit*. Thousand Oaks: Sage, 1998:1–6.
- 8 **Strauss A**, Corbin J. *Handbook of qualitative research*. Thousand Oaks: Sage, 1994.
- 9 **Ross JDC**, Sutherland S, Coia J. Genital Chlamydia trachomatis infections in primary care. *BMJ* 1996;**313**:1192–3.
- 10 **Priest P**, Yudkin P, McNulty C, *et al*. Antibacterial prescribing and antibacterial resistance in English general practice; a cross-sectional study. *BMJ* 2001;**323**:1037–41.
- 11 **Duncan B**, Hart G, Scoular A, *et al*. Qualitative analysis of psychosocial impact of diagnosis of Chlamydia trachomatis: implications for screening. *BMJ* 2000;**322**:195–9.
- 12 **Fenton KA**, Korovessis C, Johnson AM, *et al*. Sexual behaviour in Britain's reported sexually transmitted infections and prevalent genital Chlamydia trachomatis infection. *Lancet* 2001;**358**:1851–4.
- 13 **Zimmerman HL**, Potterat JJ, Dukes RL, *et al*. Epidemiological differences between chlamydia and gonorrhoea. *Am J Public Health* 1990;**80**:1338–42.
- 14 **Department of Health**. www.doh.gov.uk/sexualhealthandhiv/pdfs/77007/betterpressex.pdf, accessed 2 June, 2003.