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# Knowledge of *Chlamydia trachomatis* genital infection and its consequences in people attending a genitourinary medicine clinic

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**Objectives:** To assess knowledge of *Chlamydia trachomatis* infections, with a comparison of knowledge of *Neisseria gonorrhoeae* infections.

**Methods:** A cross sectional survey, by self completed questionnaire, of 200 subjects attending a genitourinary outpatient clinic.

**Results:** The response rate was 82% (90 male and 73 female). 51% of men (60% of females) had heard of chlamydia. 65 (82%) were unaware of the potential consequences of infection. 66% were unaware that the disease could be asymptomatic. Significantly more men (77%) than women (60%) had heard of gonorrhoea. Most participants (68%–82%) knew little of the possible consequences of this infection, and only 26% were aware that it could be asymptomatic. Knowledge was higher regarding fertility topics. There was no correlation between knowledge and either age or socioeconomic status. However, greater knowledge was displayed by those who read health information leaflets always or often. For both men and women, the preferred source of health information was the doctor. Other popular sources were health information leaflets, women's magazines, and television.

**Conclusions:** Barely half the participants had heard of chlamydia and gonorrhoea. Further knowledge of either infection was very poor. There are serious implications for public health. The reasons for this are unclear and require exploration before targeted health promotion. Doctors and the popular media are acceptable, and potentially effective, sources of information. Acquisition of knowledge is important, both to reduce sexual risk taking behaviour and its consequences, and to allow for informed consent for chlamydia screening programmes.

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## Introduction

Sexually transmitted diseases remain of major importance throughout the world and the United Kingdom.<sup>1,2</sup> Non-gonococcal urethritis is now the commonest acute sexually transmitted disease in industrialised countries. About half of cases are caused by *Chlamydia trachomatis*,<sup>3–6</sup> also the commonest cause of pelvic inflammatory disease, infertility, and ectopic pregnancies. Some men and most women with *C trachomatis* genital tract infections are asymptomatic<sup>4</sup> and carriage may persist for months.<sup>7</sup> The associated economic and human suffering costs are high.<sup>8</sup>

Chlamydial genital infections fulfil many criteria for screening and pilot schemes for national screening programmes have been proposed.<sup>9,10</sup>

Although incidence might be decreased by prevention of infection, the public requires knowledge of symptoms and sequelae to develop effective health promotion initiatives. Studies elsewhere suggest low levels of knowledge.<sup>11–13</sup> This study aimed to determine the proportion of genitourinary medicine clinic attendees who were aware of *C trachomatis* and the consequences of infection, contrasting this with knowledge of *Neisseria gonorrhoeae*.

## Subjects and methods

Consecutive attendees (100 of each sex) to a genitourinary medicine outpatient clinic were

invited to complete a short anonymous questionnaire covering (1) patient demographics; (2) knowledge about gonorrhoea, chlamydia, and fertility; and (3) actual and preferred sources of health information. (A copy of the questionnaire can be obtained from the journal office.)

Patients' knowledge of gonorrhoea, chlamydia, and matters relating to fertility was scored as one point for a correct answer, none for "don't know," and minus one point for a wrong answer. These marks were summed to create combined scores for "gonorrhoea knowledge," "chlamydia knowledge," "infertility knowledge," and "total knowledge." Socioeconomic status was based on the Carstairs deprivation scores.<sup>14</sup>

Data were analysed by appropriate statistical methods<sup>15</sup> ( $\chi^2$ , Mann–Whitney U test, Wilcoxon matched pairs signed rank sum test, Pearson correlation coefficients, Kruskal–Wallis test) in a statistical package (Minitab for Windows).

## Results

Of the 200 subjects, 163 (82%) completed questionnaires; 90 participants were male (55%) and 73 were female (45%). Their median age was 26 (interquartile range 22–33), with 10 (6%) teenagers (three males, seven females). The median Carstairs deprivation score was 5.3 (interquartile range 3.5–6.3).

Table 1 Comparison between the sexes on their knowledge of gonorrhoea and chlamydia complications

Does infection cause this complication?	Sex	Response of subjects (%)					
		Gonorrhoea			Chlamydia		
		Yes	No	Don't know	Yes	No	Don't know
Heart disease	males	0	18.9	81.1	0	24.4	75.6
	females	2.7	16.4	80.8	1.4	17.8	80.8
Diarrhoea	males	4.4	16.7	78.9	0	18.9	81.1
	females	8.2	9.6	82.2	2.7	13.7	83.6
Infertility*	males	22.2	7.8	70	35.6	4.4	70
	females	31.5	1.4	67.1	39.7	0	60.3
Eye infection	males	7.8	14.4	77.9	2.2	20	77.8
	females	9.6	12.3	78.1	6.9	19.2	73.9
Chest infection in babies	males	2.2	12.2	85.6	1.1	14.4	84.4
	females	8.2	13.7	78.1	6.9	13.7	79.5
Lower tummy pains**	males	12.2	7.8	80	10	8.9	81.1
	females	21.9	4.1	73.9	30.1	2.7	67.1
Genital discharge**	males	50	2.2	47.8	23.3	7.8	68.9
	females	41.1	1.4	57.5	38.4	0	61.6
No symptoms in some people	males	18.9	7.9	73.3	16.7	7.9	75.6
	females	23.3	1.4	75.3	21.9	4.1	73.9

Male versus female: \* $p=0.04$ , \*\* $p<0.01$ .

Males and females were not significantly different. One third of the participants (52/163, 32%) had children: 26 of the men (29%) and 26 of the women (36%). Of the women, 38 (52%) had never been pregnant; only three (1.8%) admitted to ever having treatment for infertility.

#### PATIENT KNOWLEDGE OF GONORRHOEA

Sixty nine of 90 (77%) males had heard of gonorrhoea, significantly more than 44/73 (60%) females ( $p = 0.02$ ).

Only 48% were aware that genital discharge was a symptom. For the remaining seven questions, the majority (68–82%) did not know that gonorrhoea caused these complications. A misconception existed that gonorrhoea did not cause eye infections. There was no significant difference between the sexes in their knowledge of gonorrhoea (table 1).

#### PATIENT KNOWLEDGE OF CHLAMYDIA

Forty six of 90 (51%) males and 44/73 (60%) females had heard of chlamydia ( $p = 0.24$ ).

For all eight questions, most subjects (65–82%) did not know that chlamydia caused these complications, such as eye infections or chest infections in babies. There was no significant difference between the sexes in overall chlamydia knowledge scores. However, females were more aware that chlamydia caused infertility ( $p=0.04$ ), lower abdominal pains ( $p<0.01$ ), and genital discharge ( $p=0.01$ ) (table 1).

#### PATIENT KNOWLEDGE OF INFERTILITY

For five questions relating to fertility the commonest answer (50–63% of male and female subjects) was "don't know." Most subjects knew that "ovary problems" or "oral contraception" reduced fertility. Females were more aware that herpes infections do not cause infertility ( $p=0.02$ ). There were no other significant differences between the sexes.

#### OVERALL PATIENT KNOWLEDGE

The total knowledge scores were similar in males (median 4.0) and females (median 4.0). Males showed a significantly higher level of

Table 2 Comparison of the actual and preferred sources of health information on gonorrhoea and chlamydia

Sources of information	Actual sources for gonorrhoea (%)	Actual sources for chlamydia (%)	Preferred sources (%)
Doctor	14 (9)	25 (15)	90 (60)
Nurse	7 (4)	7 (4)	28 (17)
TV	25 (15)	11 (7)	50 (31)
Radio	4 (2)	2 (1)	13 (8)
Leaflets	40 (24)	28 (17)	73 (45)
Friend	27 (17)	19 (12)	30 (18)
Magazine	26 (16)	21 (13)	49 (30)
Newspaper	10 (6)	5 (3)	36 (22)
Don't recall	23 (14)	15 (9)	— (—)
Other	13 (8)	7 (4)	13 (8)

knowledge about gonorrhoea than about chlamydia ( $p = 0.008$ ), females did not ( $p = 0.53$ ).

There was no significant correlation between total or specific knowledge scores and age or Carstairs deprivation scores.

#### SOURCES OF PATIENT INFORMATION

Equal numbers of participants read leaflets always/often as those who read them rarely/never. Significantly ( $p=0.03$ ) more females read leaflets always/often (females 42/72, males 35/86) whereas males tended to read them rarely/never (females 30/77, males 51/86).

The median total knowledge score of those 77 participants who read leaflets always/often was 5.0 (IQR 2.0–7.0), significantly higher than the median of 3.0 (IQR 1.5–5.5) for the 81 subjects who rarely or never read these leaflets ( $p = 0.04$ ). Participants' attention to information leaflets was not significantly associated with Carstairs deprivation scores.

The commonest source of information was health information leaflets, followed by friends, women's magazines, and television. Newspapers contributed little. The medical profession was by far the preferred source of health information, followed by health education leaflets, the media (television, women's magazines, and newspapers), nurses, and friends (table 2).

#### Discussion

Most participants in this study were relatively young (aged 20–35 years). This is a relatively sexually active age group vulnerable to sexually transmitted diseases.<sup>1–6</sup>

Although most participants knew of the existence of gonorrhoea, they knew little more. Significantly more males had heard of gonorrhoea. Three quarters did not know simple details of the disease. Only 52% knew that gonorrhoea caused genital discharge, its classic symptom, and were unaware that it may be asymptomatic or that it caused infertility. In the United States, Biro<sup>13</sup> reported a similar lack of knowledge. These studies highlight the lack of awareness of the features of sexually transmitted diseases.

Barely half the subjects had heard of chlamydia and most knew little about the possible consequences. More females knew it caused infertility, lower abdominal pains, and genital discharge. This may reflect female exposure to health information or personal experience of abdominal pain or infertility. White and Felts<sup>11</sup> found knowledge to be

similarly poor in a student population. Interestingly, female student knowledge was significantly better than male. In Ireland, when STD clinic attendees were asked to name any sexually transmitted disease, only 10% named non-gonococcal urethritis (the most common diagnosis at presentation).<sup>12</sup>

The maximum total knowledge score achievable in this study was 23. The median score for both sexes was only 4, most scoring 2–7. These scores suggest that participants knew little about these conditions. There was no association between knowledge scores and age or socioeconomic status, although there was a significant relation to use of patient information leaflets.

The commonest source of information on gonorrhoea and chlamydia was health information leaflets. Females tended to read leaflets “always/often” whereas males read them “rarely/never.” For chlamydia, doctors contributed important information. Patients also indicated that doctors were their preferred information source on sexual health. Doctors may be perceived as authoritative sources by this clinic population. Indeed, this may underlie the mass media’s use of “celebrity doctors” in television and women’s magazines. Perhaps this could be used to communicate additional health information to the public.

The actual risk of acquiring a sexually transmitted disease depends on many demographic and behavioural factors.<sup>4–8</sup> The influence of knowledge of chlamydia on risk behaviour is not well established. However, public knowledge of chlamydia assumes greater importance once a screening programme is initiated.<sup>10</sup> Without knowledge, individuals may not participate or understand the implications. Educa-

tion allows for informed consent. This study has highlighted serious gaps in knowledge of both chlamydia and gonorrhoea that merit attention.

Conflict of interest: None.

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