A Pilot Project for Chlamydia Screening in Adolescent Females Using Self-testing

Characteristics of Participants and Non-participants

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ABSTRACT

Objectives: A self-test screening program for genital *C. trachomatis* infection in female students attending high school in rural Nova Scotia was introduced. The objectives of this pilot study were to determine the extent of uptake, reasons for being/not being screened, and whether students at risk would be more likely to be screened.

Methods: The screening program was carried out between September 2005 and May 2006. Test kits were accessed through the school's health centre without first seeing the school nurse for counselling. Tests were processed non-nominally at the laboratory. A cross-sectional survey was offered to all students in the school to assess factors related to participation or non-participation. Univariate analysis was carried out for young women's sexual activity and risk taking, reasons for being participants or non-participants, risk behaviours, and knowledge about chlamydia.

Results: One hundred and sixty-three women (58%) had had vaginal intercourse at least once. Twenty-four of these used the self-test kit. Though 83% of those not using the self-test knew that females with chlamydia are very often asymptomatic, 54% indicated lack of symptoms as a reason for not doing so. Many (49%) gave low probability of infection as a reason for not using the kit, but high-risk sexual activity was frequent in these young women.

Discussion: Uptake of self-testing for *C. trachomatis* was lower than anticipated. This may be due to lack of counselling meant to encourage testing to overcome a dissonance of knowledge and behaviour. Self-testing should be further explored to better understand its potential to increase chlamydia screening among Canadian adolescents.

Key words: Adolescent; female; chlamydia; screening

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Adolescence is a time of sexual exploration, and though most adolescents make this transition without negative health outcomes, many do not.^{1,2} Of such outcomes, genital infection with *Chlamydia trachomatis* is especially important for females. In Canada, chlamydia is most common in young women aged 15-24,³ perhaps due to factors related to cervical development,⁴ more frequent partner change, and having older partners more likely to be infected than younger males.⁵ Sexually transmitted infections (STIs) cause 20% of infertility in Canada,⁶ and 64% of tubal infertility and 42% of ectopic pregnancies are attributable to infection with chlamydia.⁷ These outcomes are largely preventable with early detection and treatment.⁸

The Canadian Task Force on the Periodic Health Examination concluded that there is sufficient evidence (Grade B) for screening sexually active women younger than age 25 for chlamydia, the greatest associated benefits being prevention of infertility and perinatal complications.⁷ The Centers for Disease Control STD Treatment Guidelines suggest that from sexual initiation until age 25, all adolescents should be screened annually.⁹ Many schools include STI screening as part of student health services.¹⁰ Such programs have been found to be effective at detecting chlamydia in the US,¹¹⁻¹³ New Zealand,¹⁴ and Australia.¹⁵

Self-collection for chlamydia testing is at least as accurate as other methods. Among US women culture positive for chlamydia, self-collected vaginal swabs tested with polymerase chain reaction was more sensitive (93%) than cervical swab (91%) or first void urine (81%).¹⁶ An Australian study had similar results; the detection rate was 89% using this method, compared with 79% for both cervical swabs and first void urine.¹⁷

This study was a pilot project to determine the extent to which female students attending high school in rural Nova Scotia would participate in a self-test screening program for chlamydia. We wanted to determine the extent of uptake of screening, reasons for participating/not participating, and whether students at risk behaviourally would be more likely to be screened, in the hope that this approach might contribute to attaining screening recommendation targets for young women.

METHODS

This research took place in Amherst, Nova Scotia, a community of approximately 9,500, demographically similar to other towns in the province, and with only slightly lower than average income and education. About 600 adolescents aged 15-19 live in Amherst.¹⁸ Amherst Regional High School has a school-based health centre (SBHC) providing sexual health information/education, condoms and contraception to students through nursing and medical services. Sexual health education is delivered through classroom programs as called for by the Nova Scotia Department of Education.

Students of both genders were provided information about chlamydia and the self-test screening kit during a school assembly attended by project investigators, Public Health workers and the SBHC nurse. School newsletters, the school website and visits by the nurse to all classes also provided information. Screening was offered to female students from September 2005 to May 2006.

To make screening available to all female students, including the approximately 40% of young women who do not visit the SBHC nurse,¹⁹ kits were accessible without first seeing the SBHC nurse for counselling. Packages were left in a private area of the SBHC waiting room. Students accessed screening by picking up a kit, completing the test, and returning the package to a private drop box in the centre. Each package contained sufficient information for signed informed consent and testing instructions. Specimens were coded with a unique identifier to allow non-nominal testing at the laboratory. The SBHC nurse was able to link the test code to student records to allow students testing positive to access treatment at the SBHC. Students with positive tests were followed up by Public Health to assure contact tracing. Students were made aware of this practice during information sessions.

Manufacturer-supplied self-collected vaginal swabs were used [COBAS AMPLICOR® *Chlamydia trachomatis* test, Roche Diagnostics, Hoffmann-LaRoche Ltd., Laval, Quebec]. All results were interpreted according to the manufacturer's guidelines based on signal cut-offs.

TABLE I

Proportions of Sexually Active Young Women with Specific Sexual Behaviours, by Grade

	9 (n=32)	10 (n=50)	Grade 11 (n=35)	12 (n=46)	p-value
Sexually active in past 12 months	97	100	97	93	0.305
More than one partner in lifetime	59	50	55	73	0.143
More than one partner in previous year	44	38	40	33	0.821
Always used condoms over past year	55	64	46	30	0.008
Unplanned sex in past year while using alcohol or drugs	57	24	23	30	0.013
Used chlamydia self-test kit	9	16	17	15	0.809
Had an STD test in past year by MD	13	14	15	11	0.946

To assess reasons for participation or non-participation and characteristics of participants and non-participants, a school-wide survey was completed on a single day in May 2006. Surveys were administered during regularly scheduled classes by teachers trained by the research team. Parents were sent advance notification of the survey, and could refuse to have their children participate by contacting the school directly. Written informed consent was obtained from students before survey administration. The Capital Health Human Research Ethics Board granted approval for the study. All students were asked questions about sexual behaviours and about knowledge of *C. trachomatis*. Behavioural questions related to number of partners, condom use and having unplanned sex while using substances. Knowledge was assessed using true, false, and "don't know" responses to statements about chlamydia. Knowledge questions pertained to infection and being asymptomatic, the role of condoms in prevention, infertility as a result of infection, prevalence of chlamydia in adolescents, and confidentiality of treatment. Females were asked about their reasons for screening and not screening, and males about their support for screening. Results reported here are for females.

Statistical analysis was carried out using SPSS Version 14.5. Univariate statistics were generated to describe young women's sexual activity and risk taking by grade, their reasons for being participants or non-participants, their risk behaviours by screening status, and their knowledge about chlamydia, using the chi-square statistic. Comparisons of sexual risk behaviours were then made for those unscreened young women with and without low self-perceived risk as a reason for not being screened.

RESULTS

Two hundred and seventy-nine females responded (86% of those registered for class at the time of the survey). Their mean age was 16.2 years (range 14-19). One hundred sixty-three young women (58%) had had intercourse at least once. Forty-two percent of those in grade 9 were sexually experienced, compared with 74% of those in grade 12.

In the actual screening program, 27 tests were completed and 2 tests were positive. Two of the negative tests were in young women who were not sexually active – one because she was afraid sexual contact had occurred while she was intoxicated, and another because she felt she should be tested for immigration purposes. The survey reached 24 of the 25 sexually active young women screened.

Most of the young women (96%) had been sexually active in the previous year and 59% had >1 lifetime sexual partner (Table I). Those in grade 12 less often reported always using condoms than students in other grades. Grade 9 students reported more unplanned intercourse while using substances.

Table II shows proportions of young women screened and not screened indicating reasons for their choices. Respondents could indicate as many reasons as they felt were factors in making their decisions. That most commonly reported for screening was wanting reassurance from a negative test (58%). Concern about infection was indicated by only 17%. Reasons for not screening most commonly reported were being asymptomatic (54%), low perceived risk of chlamydia (49%), and being sure their boyfriend was not infected (39%).

We also examined sexual risk behaviours by screening status. Having >1 lifetime partner, and having >1 partner in the pre-

TABLE II

Reasons Given by Young Women Using and Not Using the Self-test Kit

Young Women's Reasons for Being Tested (n=24)	Proportion of Young Women Indicating Reason
Wanted to be reassured by a negative test	58
Encouraged to have test by Health Centre nurse	33
Wanted to be tested in a way that was totally confidential	33
Kit seemed a convenient way to check about having chlamydia	33
A friend had used the self-test kit	29
Boyfriend thought it was a good idea	29
Felt possibility of infection	17
Did not want an internal examination	17
Embarrassed to see a physician	17
Had symptoms of chlamydia	8
Young Women's Reasons for Not Having Test (n=139)	
Did not have symptoms	54
Estimated own risk of chlamydia very low	49
Sure that boyfriend was not infected	39
Did not want to have to talk with Public Health if infected	14
My friends did not do the test	13
Had chlamydia test done elsewhere	13
Did not want to know if infected	11
Not a user of the Health Centre	11
Boyfriend said not to get test	4
Afraid the test would hurt	4

vious year were seen more frequently in those using the self-test (71% vs. 57%, and 46% vs. 37%, respectively), while less consistent condom use and unplanned intercourse while using substances were seen more in those not tested (59% vs. 42%, and 33% vs. 27%, respectively). None of these differences was statistically significant.

No significant differences were seen in proportions of correct response to knowledge questions by screening status group, and correct responses were provided by those not screened $\geq 73\%$ of the time for 6 of the 7 questions asked.

Finally, we examined sexual risk behaviours by perception of risk of infection as a reason for not being screened. Though all risk behaviours were reported less often in those indicating lower perceived risk, these differences were not statistically significant, and many non-participants indicating lower risk had engaged in risky behaviours.

DISCUSSION

We anticipated higher participation in screening. A crucial concern may be not providing counselling immediately before testing. Schools in Louisiana counselling individual students about screening benefits were able to obtain samples at least once from 83% of students when screening was provided over three years.¹¹ At Pittsburgh high schools, clients of health centres were approached directly by staff and asked to enroll in a study of self-collection specimens for chlamydia; 75%

of those approached participated.¹³ A program in Philadelphia screened 65% of 30,000 students counselled in small groups and provided testing kits directly.¹² In New Zealand, a screening rate of 84% was obtained among sexually active students by providing educational sessions in class and providing testing kits immediately.¹⁴

We sought to increase screening by making it more accessible to young women who might be reluctant to have an initial visit with the SBHC nurse, and by providing non-nominal testing at the laboratory level to address the issue of confidentiality, which is so important to youth.²⁰ We made screening kits freely available in a private location within the SBHC, without previous health professional counselling other than a schoolwide educational effort, and by encoding specimens. No formal counselling process to facilitate participation was offered potential users of self-testing, though the SBHC nurse responded to questions if asked.

The most frequent reason reported for not being screened was not having symptoms, even though 83% of those not screened knew that women with chlamydia are often asymptomatic. Low self-assessed risk was next most common (49%), followed by being sure their boyfriend was not infected (39%). When we examined sexual risk behaviours in relationship to self-assessed risk in non-screenees, differences were not significant, and many non-screenees indicating low perception of risk had engaged in high-risk behaviours. No differences were seen in risk behaviours in

those who were screened and those who were not, and high-risk behaviours were common in both groups. In addition, among those participating, the need for total confidentiality of testing and embarrassment about seeing a physician did not figure prominently as reasons for doing so. The majority of US adolescents engaging in risk behaviours estimate their risk of chlamydia as very low.²¹ It may be that in allowing students to undergo screening without initially seeing the SBHC nurse, opportunities were missed to encourage screening through one-on-one discussion about risk of infection. A more direct approach during health visits to health professionals might yield higher rates of participation.

While 25 sexually active young women participated in the screening program, just 21 young women reported having an STI test by a physician in the year prior to the survey, and only 2 of these visits were because of a positive self-test. Self-testing thus represented a considerable proportion of chlamydia testing carried out in Amherst high school students. This may be more important since Nova Scotia has increased the age of first Pap test from 18 to 21 years, or three years after beginning sexual activity, whichever comes first.²² Many family doctors regard Pap testing as an opportunity for chlamydia testing,²³ and a major reason for not screening for chlamydia in adolescents is discomfort with recommending screening outside of visits for gynaecological examination.²⁴ With this new policy, a woman who begins sexual activity at age 18 could now wait until age 21 before a chlamydia test is carried out in conjunction with Pap testing. Few Canadian studies have been carried out, but in Manitoba, only 25% of women aged 15-24 were tested for chlamydia in 1997-1998.²⁵ Especially where screening opportunities are reduced by such policy changes, new means of screening, including self-testing, should be explored.

This study has limitations. Screening was offered only to women attending high school in one Nova Scotia community, and different results might apply elsewhere. A major limitation is small sample size, particularly the number of participants screened, and thus very limited statistical power to detect differences between participants and non-participants. We

believe, however, that the study indicates a limited role for screening without individual health professional interaction. Larger studies of chlamydia self-testing at SBHCs will be required to determine how to increase screening in adolescents.

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RÉSUMÉ

Objectifs : Un programme de dépistage des infections génitales à *Chlamydia trachomatis* au moyen d'une trousse d'auto-examen a été lancé pour les adolescentes fréquentant l'école secondaire dans les zones rurales de la Nouvelle-Écosse. Les objectifs de notre étude pilote étaient de déterminer le niveau de participation au programme, les raisons pour lesquelles les élèves se soumettaient ou non au dépistage, et si les élèves à risque étaient ou non plus susceptibles d'utiliser la trousse.

Méthode : Le programme de dépistage a été administré entre septembre 2005 et mai 2006. Des trousses d'examen étaient disponibles au centre sanitaire de l'école, mais il n'était pas prévu que les élèves reçoivent au préalable les conseils de l'infirmière scolaire. Les trousses ont été analysées anonymement en laboratoire. Un sondage transversal a été proposé à toutes les élèves de l'école pour déterminer les facteurs liés à leur participation ou à leur non-participation. Une analyse univariée a porté sur l'activité sexuelle des jeunes femmes et les risques qu'elles prennent, sur leurs raisons de participer ou non au programme de dépistage, sur leurs comportements à risque et sur leurs connaissances de la chlamydie.

Résultats : Cent soixante-trois filles (58 %) avaient eu des relations sexuelles avec pénétration vaginale au moins une fois. Vingt-quatre de ces jeunes filles avaient utilisé la trousse d'auto-examen. Même si 83 % des élèves n'ayant pas utilisé la trousse savaient que les femmes qui présentent une chlamydie sont très souvent asymptomatiques, 54 % ont indiqué qu'elles ne s'étaient pas soumises au dépistage parce qu'elles ne présentaient pas de symptômes. Beaucoup (49 %) ont mentionné la faible probabilité d'infection comme raison de ne pas avoir utilisé la trousse, mais les activités sexuelles à risque élevé étaient fréquentes chez ces jeunes femmes.

Discussion : La participation à l'autodépistage de *C. trachomatis* a été plus faible que prévu, ce qui pourrait s'expliquer par l'absence de counseling pour surmonter la dissonance entre les connaissances et les comportements et encourager le dépistage. L'auto-examen devrait faire l'objet d'études plus poussées pour mieux comprendre ses possibilités en tant qu'outil de dépistage de la chlamydie chez les adolescentes canadiennes.

Mots clés : adolescentes; chlamydie; dépistage