Chlamydial Urethral Infection in Male Students in Chiang Mai: A Screening Test of Urine Deposits by Enzyme Immunoassay (EIA)

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Abstract

Adolescent males are considered to be an important genital chlamydial reservoir. However, there has been little information on urethral chlamydial infection in Thai adolescent males. About one fourth of males who are genital chlamydial reservoirs are asymptomatic. An appropriate means of defining the extent of chlamydial infection in adolescent males would be a non-invasive screening survey, instead of the conventional method of a deep swab cell culture, which is painful. The objectives of this study were to estimate the prevalence and to determine what factors should indicate the use of a screening test for urethral chlamydial infection in adolescent males residing in Chiang Mai. Chlamydial urethritis was detected by examining urine deposits for chlamydial antigen by enzyme immunoassay (EIA).

Key word : Chlamydial Urethritis, Male Student, Screening Test, Urine Deposit, EIA

Male students studying in all vocational schools in Chiang Mai, Thailand were asked to collect their first morning urine samples. Direct chlamydial antigen detection in urine deposits was done by enzyme immunoassay (EIA) (Microtrak II Chlamydia EIA, Syva Company). Information on symptoms of urethritis and sex experience was also collected by a self-administered questionnaire. Of 827 students contacted, 507 (61%) completed the questionnaire and provided overnight first voided urine samples, while 121 (24%) completed the questionnaire but declined to provide urine samples. An additional group of 328 students were asked to complete the questionnaire anonymously, without providing urine, in order to assess the influence of anonymity of the questionnaire on students' responses.

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The mean age of students providing urine samples was 19.3 ± 1.3 years old (range 16-24). The overall prevalence of positive chlamydia antigen in the urine deposits was 11.2 per cent. Of 57 positive cases, 18 refused ever having had sex experience. Students who provided urine samples tended to report less sex experience but greater frequency of past symptoms of urethritis than those who did not provide urine samples or those who responded to the questionnaire anonymously. It is concluded that the prevalence of chlamydial urethritis found in this study might be over estimated by an over-representation of students with past symptoms of urethritis and false positive test results. The positive EIA tests should be confirmed by other tests. In this population, a history of urethritis symtoms should be considered as a more important factor indicating chlamydial screening than a history of sex experience.

Genital chlamydial infection may have serious consequences for human reproduction and fertility[1-3]. Many studies have reported a higher prevalence of genital chlamydial infection among the younger population[4,5]. Determination of the extent of chlamydial infection among adolescents is essential for planning a control strategy. Because a significant proportion of chlamydial infections are asymptomatic[6,7], the appropriate means to identify its extent is to apply a screening test to a field population rather than to STD clinic clients. Unfortunately, the diagnostic method of choice, i.e. cell culture, or polymerase chain reaction (PCR) require complicated and costly facilities[8] and are impractical in large scale population surveys. Enzyme immunoassay (EIA) is useful for screening because it is inexpensive and employs a rapid antigen detection assay. Several studies among adolescent females in Western populations, notably the United States[8, 9] have reported the prevalence of genital chlamydial infection by screening survey methods, but similar studies among adolescent males have been few[10-12]. A major barrier in studying asymptomatic males has been the lack of a practical, sensitive and acceptable screening for urethral infection. Specimen collection in males involves taking deep urethral swabs, a procedure that is uncomfortable and usually painful.

Attention has focused on identifying the presence of STD agents in men from centrifuged urine deposits[10,11]. The urine flow washes out infected cells from the urethra, and these may be recovered in the centrifuged urine deposits. The chlamydial antigen in urine deposits, demonstrated by immunofluorescence or EIA, have been shown to have 73 per cent sensitivity and 99 per cent specificity compared to routine urethral cell culture isolation[11]. There has been no information on the prevalence of genital chlamydial infection among Thai adolescent males. Most studies conducted in Thailand have been confined to small scale STD clinics where the majority of clients are symptomatic[13,14]. This study aimed to estimate the prevalence of urethral chlamydial infection among Thai adolescent males, residing in Chiang Mai, Thailand, by a large scale screening survey of their urine deposits. Indications for screening tests for chlamydial urethritis among adolescents should be defined for Eastern societies. In societies where premarital sex is not generally accepted, such as in Thailand, a history of sex experience is likely to be under-reported. Therefore, the extent of sex experience will not be a valid indicator for risk of chlamydial infection among Thai adolescents. The secondary aim of this study was to determine whether anonymous students reported the extent of their sex experience differently.

METHOD

Between July and September 1993, 827 students from all (nine) vocational schools in Chiang Mai were enrolled. They were 24 years old or younger and were willing to participate in the study. A sample of 25 ml of overnight first voided urine was requested from each student. A set of questionnaires concerning history of urethritis and sex experience were to be completed by them. Five hundred and seven (61%) answered the questionnaires and provided urine samples, while 161 (19.5%) completed the questionnaires but declined to provide urine samples. An additional 328 students were asked to complete the questionnaires anomymously in order to assess the influence of anonymity on responses. Chlamydial antigen detection in the urine deposits was done by enzyme immunoassay (EIA) (Microtrak II Chlamydia EIA, Syva Company). Statistical tests to compare subgroups of the volunteers included Chi-square or Fisher's exact test, where appropriate.

RESULTS

The overall prevalence of positive EIA test for chlamydial antigen in urine deposits was 11.2 per cent (57/507). Variation among schools ranged

from 5.7 per cent to 28.6 per cent. There was no statistical difference between the prevalence of positive EIA test between students aged 18 years old or younger (12.7%) and those who were older (10.6%). Students with a positive EIA test had similar proportions of present symptoms of urethritis (i.e., dysuria, urethral discharge or penile itching) when compared with students with a negative test. Students with a positive EIA test reported a higher prevalence of symptoms of urethritis in the past and urethral discharge in the past year, although this was not statistically significant because of the small sample size. Eighteen positive students denied sexual intercouse. Though not statistically significant, more risky sex behavior was reported by positive students, including having had a female commercial sex worker as a first sexual partner, younger age at first sexual intercourse, unprotected sexual intercourse and more than one sexual partner.

The students who were not anonymous, whether they provided urine or not, reported similar frequencies of urethritis as those who were anonymous (Table 1). Students providing urine reported a higher prevalence of any symptom of urethritis in the past year (27.2%) when compared with students not providing urine (19.8%) and anonymous students (18.8%) ($p = 0.01$). They also reported a higher frequency of dysuria in the past year (11.4%) compared with students not providing urine (4.1%) and anomymous students (4.8%) ($p = 0.002$).

Students providing urine reported less sex experience than students not providing urine or anonymous students. Sixty one per cent of them denied sexual intercouse, whereas, 78 per cent of the students not providing urine and 80 per cent of anonymous students admitted so ($p < 0.001$). Twenty four per cent of the students providing urine denied having had sexual intercourse in the past year while 80 per cent of students providing urine and 80 per cent anonymous students did ($p < 0.001$). Students providing urine also reported fewer multiple sexual partners ($p < 0.001$) (Table 2).

All 58 students who gave positive EIA results (including one weak positive) were followed and treated. Nineteen (32.8%) students denied having had sex experience. For 39 (67.2%) students who admitted having had sex experience, 14 (35.9%) thought that the source of infection was from prostitutes, 23 (60.0%) from girl friends and 2 (5.1%) from boy friends. Only 7 students with positive EIA results brought their female partners for treatment. Three of them had pelvic examination. Cervical swab cultures were positive for chlamydia in 2.

DISCUSSION

Since collection of urine was done on a voluntary basis, the prevalence of chlamydial urethritis found in this study might be over-estimated by an over- representation of students with a history of past STDs or urethritis. In addition, false positive test results might have occurred, because some students with positive results denied ever having had sex experience. However, EIA test for urine depo-

Table 1. Symtoms of urethritis by anonymity of questionnaires.

Symptoms of urethritis	Not anonymous		Anonymous	p value
	With urine (n = 507)	Without urine (n = 121)	(n = 396)	
Present symptoms				
Dysuria	25 (4.9)	6 (5.0)	22 (5.6)	0.5
Urethral discharge	10 (2.0)	2 (1.7)	10 (2.5)	0.5
Penile itching	29 (5.7)	8 (6.6)	14 (3.5)	0.2
Any symptom ever had	139 (27.4)	24 (19.8)	75 (18.8)	0.01*
Symptoms in the past year				
Dysuria	58 (11.4)	5 (4.1)	19 (4.8)	0.002*
Urethral discharge	11 (2.2)	0 (0.0)	7 (1.8)	0.1
Penile itching	30 (5.9)	9 (7.4)	17 (4.3)	0.1

*Statistical significant

Table 2. Sex experience by anonymity of questionnaires.

Sex Experience	Not anonymous		Anonymous	p value
	With urine (n = 507)	Without urine (n = 121)	(n = 396)	
Ever having sexual intercourse				
No	175 (34.5)	26 (21.5)	73 (18.4)	
Yes	330 (65.1)	95 (78.5)	321 (80.7)	<0.0001*
No response	2 (0.4)	0 (0.0)	4 (1.0)	
First person having had sex with				
Female partners	238 (72.1)	78 (82.1)	229 (71.3)	
Female CSWS	80 (24.2)	14 (14.7)	74 (23.1)	
Male partners	5 (1.5)	1 (1.1)	0 (0.0)	0.06
Others	2 (0.6)	0 (0.0)	3 (0.9)	
No response	5 (1.5)	2 (2.1)	15 (4.7)	
Age at first sexual intercourse				
10-15	101 (30.6)	28 (29.5)	99 (30.8)	
16-17	130 (39.4)	37 (38.9)	144 (44.9)	0.1
18-20	75 (22.7)	20 (21.1)	45 (14.0)	
No response	24 (7.3)	10 (10.5)	33 (10.3)	
Sexual intercourse in past year				
No	80 (24.2)	19 (20.0)	50 (15.6)	
Yes	250 (75.8)	76 (80.0)	257 (80.1)	<0.001*
No response	0 (0.0)	0 (0.0)	14 (4.4)	
Regular use of STD preventive methods when having sex				
Never	68 (20.0)	25 (26.3)	50 (15.6)	
Ever	260 (78.8)	70 (73.3)	263 (81.9)	0.02*
No response	2 (0.6)	0 (0.0)	8 (2.5)	
Number of sexual partners				
1	102 (30.9)	18 (18.9)	63 (19.6)	
>1, No CSW**	119 (36.1)	42 (44.2)	108 (33.6)	
>1, Including female CSWs	103 (31.2)	32 (33.7)	135 (42.1)	<0.001*
>1, Including male CSWs	3 (0.9)	0 (0.0)	0 (0.0)	
>1, Including either CSWs	3 (0.9)	0 (0.0)	1 (0.3)	

* Statistical significant

** CSW = Commercial sex worker

sits was feasible in mass screening for chlamydial urethritis, although a confirmatory test for positive specimens should be done. In this population, where sex experience in pre-marital adolescents was not socially accepted, a history of urethritis symptoms should be considered as a more important factor indicating chlamydial screening rather than a history of sex experience. This finding is different from Western populations where a history of sex experience such as multiple sexual partners or having new sexual partners within 2 weeks, was highly predictive of genital chlamydial infection[5,7,8,10].

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ท่อปัสสาวะอักเสบจากคลามีเดียในนักศึกษาชายในจังหวัดเชียงใหม่: การคัดกรองปัสสาวะโดยวิธี อี ไอ เอ

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วัยรุ่นชายเป็นพาหะของเชื้อคลามีเดียในอวัยวะสืบพันธุ์ที่สำคัญในประเทศที่มีการศึกษาเชื้อนี้อย่างกว้างขวาง อย่างไรก็ตามข้อมูลในประเทศไทยเกี่ยวกับเรื่องนี้ยังมีน้อยมาก ประมาณหนึ่งในสี่ของชายที่เป็นพาหะของเชื้อคลามีเดียในอวัยวะสืบพันธุ์จะไม่มีอาการ การแยกเชื้อคลามีเดียโดยการใช้ปัสสาวะเป็นวิธีการที่ทำได้ง่าย และหลีกเลี่ยงการใช้ตัวอย่างจากท่อปัสสาวะ ซึ่งวิธีการเก็บจะทำให้เกิดความเจ็บปวด

การศึกษานี้มีวัตถุประสงค์ เพื่อประมาณความชุกและศึกษาถึงปัจจัย ซึ่งจะเป็นข้อบ่งชี้ในการทดสอบเพื่อคัดกรองการติดเชื้อคลามีเดียในท่อปัสสาวะในวัยรุ่นชายในจังหวัดเชียงใหม่

ทำการขอร้องวัยรุ่นชายที่ศึกษาอยู่ในโรงเรียนอาชีวะในจังหวัดเชียงใหม่ เพื่อให้เก็บปัสสาวะมาทำการตรวจหาแอนติเจนของคลามีเดีย โดยการทดสอบ enzyme innunoassay (EIA) (Microtrak II Chlamydia EIA, Syva Company) ปัสสาวะจะต้องเป็นปัสสาวะครั้งแรก ภายหลังที่ไม่ได้ปัสสาวะมาตลอดคืน ทำการเก็บข้อมูลเกี่ยวกับอาการของท่อปัสสาวะอักเสบและประสบการณ์ทางเพศ โดยการกรอกแบบสอบถามด้วยตนเอง ในจำนวนนักเรียน 827 คน ที่ได้ขอร้อง มีเพียง 507 (61%) คน ที่ได้เก็บปัสสาวะ และกรอกแบบสอบถาม มี 121 (24%) คน ที่กรอกแบบสอบถาม แต่ได้ได้เก็บตัวอย่างปัสสาวะ ได้ทำการขอร้องให้นักเรียน 328 คน กรอกแบบสอบถาม โดยไม่ต้องระบุชื่อตนเองในแบบสอบถาม และไม่ต้องเก็บปัสสาวะ เพื่อทำการประเมินถึงผลกระทบต่อการตอบแบบสอบถาม

อายุเฉลี่ยของนักเรียนที่เก็บปัสสาวะคือ 19.3 $\pm$ 1.3 ปี (พิสัย 16–24) ความชุกของการตรวจพบคลามีเดียในปัสสาวะคือ 11.2 เปอร์เซ็นต์ ในจำนวน 57 ราย ที่ตรวจพบมี 18 รายที่ปฏิเสธว่ามีประสบการณ์ทางเพศ นักเรียนที่เก็บปัสสาวะมีแนวโน้มที่จะรายงานว่ามีประสบการณ์ทางเพศน้อยกว่า แต่มีความถี่ของการมีอาการของท่อปัสสาวะอักเสบสูงกว่านักเรียนที่ไม่ได้เก็บปัสสาวะ หรือนักเรียนที่กรอกแบบสอบถามโดยไม่ระบุชื่อ ความชุกของการติดเชื้อคลามีเดียในท่อปัสสาวะที่พบในการศึกษานี้อาจสูงกว่าความเป็นจริง เนื่องจากตัวอย่างที่ศึกษาประกอบด้วยนักเรียนที่เคยมีประวัติการอักเสบของท่อปัสสาวะ มีสัดส่วนที่สูงกว่าประชากรโดยทั่วไป และผลการทดสอบอาจให้ผลบวกลวง การตรวจ EIA ในปัสสาวะจึงควรใช้เป็นการคัดกรอง และควรได้รับการสนับสนุนการทดสอบโดยการทดสอบวิธีอื่น การมีประวัติการอักเสบของท่อปัสสาวะ เป็นปัจจัยชี้บ่งในการทำการคัดกรองที่ดีกว่าปัจจัยเกี่ยวกับประสบการณ์ทางเพศ

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