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Antibody to human immunodeficiency virus, P24 antigen and risk behaviors among some groups of female sex workers

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Objectives : *To investigate the prevalence of anti-HIV and P24 antigen among some groups of female sex workers (FSWs) and to analyse some risk behaviors towards HIV infection among this group.*

Design : *A cross-sectional study*

Setting : *The Venereal Diseases and AIDS Centers, Amphoe Muang, Amphoe Banpong and Amphoe Damnoensaduak, Ratchaburi Province.*

Subjects/Methods : *202 FSWs seeking sexually transmitted disease (STD) examinations were interviewed for personal information and sexually related behavior. Their blood specimens were collected for determining anti-HIV and P24 antigens. The results were expressed by using descriptive statistics and a proportional Z test. Risk behaviors were analysed by using odds ratio and the X^2- test.*

Results : *Of 202 FSWs, 39.60 % were anti-HIV positive and only one individual (0.50 %) was P24 antigen positive. The anti-HIV prevalence among the 21-30 years age group (46.30 %) and those of 20 years age or less (42.00 %) were significantly higher than that of the more than 30*

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years age group (20.45 %); P = 0.0027 and 0.0146, respectively. The prevalences classified by the duration of working showed no significant difference (P > 0.05). The significant risk behaviors towards HIV infection included having tattoos (OR = 3.34, P = 0.0263), alcohol consumption (OR = 3.43, P < 0.0001), having STDs in the last 3 months (OR = 2.54, P = 0.0115), condom use only occasionally (OR = 22.37, P < 0.0001) and average number of clients per night more than 3 persons (OR = 2.20, P = 0.0289).

Conclusion : *The prevalences of anti-HIV and P24 antigen among the FSWs were 39.60 % and 0.50 %, respectively, and five risk behaviors were significant for HIV infection in this group.*

Key words : *Anti-HIV, P24 Antigen, Prevalence, Risk behaviors, Female Sex workers.*

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วัตถุประสงค์ : *เพื่อหาความชุกแอนติบอดีต่อเชื้อเอชไอวี, P24 แอนติเจนและ พฤติกรรมเสี่ยงต่อการติดเชื้อเอชไอวีในหญิงบริการอาชีพพิเศษบางกลุ่ม*

รูปแบบการวิจัย : *การศึกษาภาคตัดขวาง*

สถานที่ : *ศูนย์กามโรคและโรคเอดส์ อำเภอเมือง อำเภอบ้านโป่งและ อำเภอดำเนินสะดวก จังหวัดราชบุรี*

ผู้เข้าร่วมการศึกษาและวิธีการวิจัย : *ทำการสัมภาษณ์หญิงบริการอาชีพพิเศษที่มารับบริการตรวจโรคติดต่อทางเพศสัมพันธ์ จำนวน 202 รายพร้อมทั้งเก็บตัวอย่างเลือด ตรวจหาแอนติบอดี ต่อเชื้อเอชไอวีและ P24 แอนติเจน ผลการศึกษาจะเสนอโดยใช้สถิติเชิงพรรณนาและวิเคราะห์หาความแตกต่าง โดยใช้ Proportional Z test สำหรับพฤติกรรมเสี่ยงต่อการติดเชื้อเอชไอวี วิเคราะห์โดยใช้ Odds ratio และ X^2- test*

ผลการศึกษา : *ความชุกแอนติบอดีต่อเชื้อเอชไอวีในหญิงบริการอาชีพพิเศษ ร้อยละ 39.60, P24 แอนติเจนพบร้อยละ 0.50 ความชุกแอนติบอดีในกลุ่มอายุ 21- 30 ปี (ร้อยละ 46.30) และในกลุ่มอายุ $\leq$ 20 ปี (ร้อยละ 42.00) สูงกว่าในกลุ่มอายุมากกว่า 30 ปี (ร้อยละ 20.45) อย่างมีนัยสำคัญทางสถิติ (P = 0.0027 และ 0.0146 ตามลำดับ) เมื่อวิเคราะห์ความชุกตามระยะเวลาของการขายบริการพบว่า มีความแตกต่างกันอย่างไม่มีนัยสำคัญทางสถิติ (P > 0.05) สำหรับพฤติกรรมเสี่ยงต่อการติดเชื้อเอชไอวีที่มีนัยสำคัญทางสถิติได้แก่ การสัก (OR = 3.34, P = 0.0263) , การดื่มสุรา/เหล้า (OR = 3.43, P < 0.0001) เป็นโรคติดต่อทางเพศสัมพันธ์ในช่วง 3 เดือนหลัง (OR = 2.54, P = 0.0115) การใช้ถุงยางอนามัยเพียงบางครั้ง (OR = 22.37, P < 0.0001) และมีจำนวนคู่นอนเฉลี่ยมากกว่า 3 คนต่อคืน (OR = 2.20, P = 0.0289)*

สรุปผล : *ความชุกแอนติบอดีต่อเชื้อเอชไอวี และ P24 แอนติเจนในหญิงบริการอาชีพพิเศษร้อยละ 39.60 และ 0.50 ตามลำดับ พบพฤติกรรมเสี่ยง 5 พฤติกรรมในกลุ่มหญิงบริการอาชีพพิเศษที่เสี่ยงต่อการติดเชื้อเอชไอวี*

Human immunodeficiency virus (HIV) infection is a world-wide public health problem. It attacked more than 30 millon people in the year 1997.[1] In Thailand, the first case was documented in 1984. Since then there has been a rapid increase in reported infection rates .[2,3] The virus attacks the CD^+4 cells which are human immune cells, but most infected individuals are initially asymptomatic.[4,5] The long term asymptomatic cases can spread the virus to other people by sexual contact, parenteral routes and mother to child transmission.[2,4,5] One of the highest risk groups in Thailand is that of female sex workers (FSWs) with rates of 3.5 % to 49 %.[3] The Thai police estimate the number of FSWs in Thailand at more than 500,000 individuals.[6] Most of these are young and single. Therefore , they are not only the highest risk group but they are also the major active carriers and transmittors of HIV infection. Reported HIV infected cases have been tested for determining anti-HIV but results could be negative for the first 3-6 months after infection. The anti-HIV negative infected cases can still transmit the virus to others. The P24 antigen assay can be positive prior to the positivity of anti-HIV.[7,8] This study attempts to investigate the prevalences of P24 antigen and anti-HIV among FSWs and to analyse some risk behaviors towards HIV infection among this group. This would be valuable for increasing detection rates and for developing AIDS education in order to reduce risk behaviors in this target group.

Materials and Methods

Study design and Data collection

A cross - sectional study was conducted among 202 FSWs who sought examination for sexually transmitted disease (STDs) at the Venereal Diseases and AIDS Centers, Amphoe Muang, Amphoe Banpong and Amphoe Damnoensaduak, Ratchaburi Province, during July to December 1995. The sample size was calculated by the formular : $n = Z^2_a PQ/ (Z^2_a PQ + Nd^2)$. With N = Number of total FSWs in Ratchaburi = 670 , $\alpha = 0.05$, d = 0.05, P = the proportion of HIV infection in FSWs from previous study = 0.25;[3] the calculated sample size was 202 cases. All studied FSWs were interviewed about personal information and health behaviors, including the history of STDs, sexual partners per night and condom use. Their blood specimens were collected for deter-mining anti-HIV by a particle agglutination (Fujirebio: Serodia) and confirmed by an enzyme immunoassay (Organon: Vironostika HIV Uni-form II) ; and P24 antigen was assayed by an enzyme immunoassay (Pasteur EIAVIA Ag I). The cut - off value for positive results followed the Kits' recommendation.

Data analysis

Data from the study were expressed by using percentages and other descriptive statistics. The proportional Z test was applied for testing a significant difference between percentages of two groups. The X^2 - test and odds ratio were used for evaluating some risk behaviors between FSWs with and without anti - HIV. The critical level of $\alpha = 0.05$ was used for statistical significance.

Results

General characteristics and HIV sero-prevalence among studied FSWs

Of 202 FSWs, almost 70 % were less than 25 years old (range = 18 - 46 years). A majority (72.77 %) finished primary education and 20.30 % never attended

school. Half of them came from the north of Thailand and the remainder from other areas. About 60 % had worked in the sex trade for less than 4 years and only 5.94 % had done so for more than 8 years.

The laboratory results showed that 39.60 % were anti-HIV positive and only one individual (0.50 %) was positive for P24 antigen (Table 1). The highest anti-HIV prevalence (46.30 %) was found in FSWs with ages 21-30 years. The lowest, 20.45 % was found in FSWs older than 30 years. The prevalences among the 21-30 years and 20 years or less age group were significantly higher than for FSWs more than 30 years old, P = 0.0027 and 0.0146, respectively. Details are shown in Table 1.

When we classified the prevalence by the duration of working in the sex trade, the highest anti-HIV prevalence (44.29 %) was found in FSWs working 4 - 8 years. The lowest (25.00 %) was found in FSWs working more than 8 years. There was no statistical significance between each duration group, P > 0.05 (Table 2).

Table 1. Prevalences of Anti-HIV and P24 antigen among studied female sex workers by age.

Age (years)	No. of tested	Anti-HIV positive by PA and ELISA No. (%)	P24 antigen Positive No. (%)
≤ 20	50	21 (42.00) [a]	0 (0.00)
21 - 30	108	50 (46.30) [b]	1 (0.93)
> 30	44	9 (20.45) [c]	0 (0.00)
Total	202	80 (39.60)	1 (0.50)

[a,b] Non - significant difference by proportional Z test, P = 0.3192

[a,c] Statistical significance by proportional Z test, P = 0.0146

[b,c] Statistical significance by proportional Z test, P = 0.0027

Table 2. Prevalences of Anti - HIV and P24 antigen among 202 female sex workers by duration of working in the sex trade.

Duration of working (years)	No of tested	Anti-HIV positive by PA and ELISA No. (%)	P24 antigen Positive No. (%)
≤ 4	120	46 (38.33)	1 (0.83)
4 - 8	70	31 (44.29)	0 (0.00)
> 8	12	3 (25.00)	0 (0.00)
Total	202	80 (39.60)	1 (0.50)

There was no significant difference between each duration ; P > 0.05

Risk behaviors towards HIV infection among studied FSWs

The health behaviors obtained from interviews of the studied FSWs were compared between the anti-HIV positive group and the anti-HIV negative group. The results revealed that risk behaviors for HIV infection which were significantly different between the two groups were: (a) having tattoos (OR = 3.34, P = 0.0263), (b) alcohol consumption (OR = 3.43, P < 0.0001), (c) having STDs in the last 3 months (OR = 2.54, P = 0.0115), (d) condom use only occasionally (OR = 22.37, P < 0.0001) and (e) average number of clients per night more than three persons (OR = 2.20, P = 0.0289), as shown in Table 3.

Table 3. Risk behaviors towards HIV infection among studied female sex workers.

Risk behaviors		Anti - HIV positive gr. (n = 80)	Anti - HIV negative gr. (n = 122)	Odds ratio 95 % CI.	P - value from X^2-test
Sharing used					
blade	: yes	8 (10.00)	12 (9.84)	1.02	0.9696
	no	72 (90.00)	110 (90.16)	0.36,2.84	
Sharing used					
toothbrush	: yes	12 (15.00)	15 (12.29)	1.26	0.5815
	no	68 (85.00)	107 (87.71)	0.52,3.06	
Tattoo	: yes	10 (12.50)	5 (4.10)	3.34	0.0263*
	no	70 (87.50)	117 (95.90)	1.00,11.78	
Injection by					
Quack doctor	: yes	5 (6.25)	6 (4.92)	1.29	0.6840
	no	75 (93.75)	116 (95.08)	0.38,5.26	
Alcohol drinking	: yes	61 (76.25)	59 (48.36)	3.43	< 0.0001*
	no	19 (23.75)	63 (51.64)	1.76,6.74	
STDs in the last					
3 months	: yes	21 (26.25)	15 (12.30)	2.54	0.0115*
	no	59 (73.75)	107 (87.70)	1.15,5.65	
Condom use in the last					
one year : sometimes		72 (90.00)	35 (28.69)	22.37	< 0.0001*
everytime		8 (10.00)	87 (71.31)	9.21,56.28	
Average No. of					
cleints/night : > 3		21(25.00)	17 (13.93)	2.20	0.0289*
≤ 3		59 (75.00)	105 (86.07)	1.02,4.77	

* Statistically significant difference at $\alpha = 0.05$

Discussion

This study showed that 39.60 % of the studied FSWs were anti-HIV positive which was higher than a recent survey in the central part of Thailand among the same group (average = 23 %).[3] The reason may be a true increase of HIV infection or/and the higher mobility of infected FSWs from other groups, especially the north of Thailand which has high endemic HIV.[3,9] As supporting data from our study, 50 % of the FSWs came from the northern region. An assay of P24

antigen could increase the detection rate of HIV infection, especially during the early stages of infection. [7,8] However , only one of the studied FSWs was P24 antigen positive with anti-HIV. It may be due to the formation of circulating immune complexes of P24 antigen and anti-P24 antibody. The antigen remains at detectable level for 1 to 3 weeks and will disappear when P24 antibody increases. [10,11] It seemed that the antigen detection was unuseful for HIV screening in the high prevalence group.

We found five significant risk behaviors towards HIV infection among the studied FSWs. They included having tattoos, alcohol consumption, having STDs in the last 3 months, condom use only occasionally and a number of clients per night more than three persons. Most of risk behaviors were similar to previous studies among high HIV - risk groups. [12,13] Several behaviors were direct risk factors for HIV/STD infection . The occurence of STDs, such as syphilis, herpes and chancroid, makes breaks in the skin, thus enchancing the opportunities of HIV infection. [14] One paper presented in a Vanocuver conference showed that HIV levels in the semen were much higher in patients with urethritis, gonorrhea and trichomoniasis. [15] Having more sexual partners allowed for greater exposures and risks. A tattoo was one of important risk behaviors in diseases transmitted by the parenteral route, such as like hepatitis B. [16] The factor of alcohol consumption was an indirect risk behavior because, after consumption, the FSW was more likely to have an unsafe sexual relationship, and her client who drank alcohol was more prone to have extramarital sex without the use of a condom. [13,17]

As in other countries, an intensive HIV prevention program focusing on a 100 per cent condom use policy has reduced the incidence of HIV/STDs in Thailand. The percentage of Thai men visiting brothels has reduced, and the reported rate of condom use seems to be increasing. The reported percentage of condom use usually comes from brothel oweners or from quantitative interviews, and likely is higher than in actuality. [18] When clients came regularly or looked clean and well-mannered, FSW often did not use a condom. In addition, when the FSW suffered from painful intercourse associated with condom, use and when she was concerned about lengthening the period of intercourse, she might agree to unprotected sexual activity. [18,19] Therefore, dependance on condom use may be insufficient for reducing HIV/STD cases. Health education should emphasize not only condom use but also avoidance of pre-marital or extra-marital sex relations. Vocational skill education [20] and health promotion activities should be strengthened among adolescents for HIV/STD prevention and control.

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