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Factors Associated with HIV-1 Infection among Adolescent Pregnancy

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ABSTRACT

Objective To study the factors associated with HIV-1 infected adolescent pregnancy.
Design Case-control study.
Setting Department of Obstetrics and Gynaecology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University.
Subjects Thirty-two cases of HIV-1 infected adolescent pregnancy and 64 cases of adolescent pregnancy with HIV-1 seronegative.
Results The mean age of seropositive adolescent was 18.58 ± 1.48 years and seronegative was 18.51 ± 1.52 years. The risk factors of HIV-1 infection among adolescent pregnancy were education less than 6 years, no contraceptive use prior to this pregnancy and syphilis.
Conclusion This study revealed the risk factors for HIV-1 infection among adolescent parturients. Education, contraception and prevention of sexually transmitted disease could reduce risk of HIV infection in this population.

Key words : adolescent pregnancy, HIV-1, risk factors

An emerging public health problem among adolescents is the epidemic of human immunodeficiency virus infection. There are very few reports concerning HIV-1 infection among Thai adolescent pregnancy. Even though HIV-1 infection in pregnancy was 2% for the whole country in 1993 but HIV infection in adolescent pregnancy had no details.[1] Since January 1991, routine voluntary HIV antibody screening has been offered to women seeking prenatal care at

Ramathibodi hospital. We previously reported 1.03% prevalence of HIV-1 infection among adolescent pregnancy while prevalence of HIV-1 infection among general pregnancy was only 0.3%.[2] The prevalence of HIV-1 infected adolescent pregnancy was about 3 times higher than general HIV-1 infected pregnancy. The objective of this report was to study the factors associated with HIV-1 infected adolescent pregnancy.

Materials and Methods

Study design : This study is case-control study.

Subjects : Ramathibodi Hospital is the 800-bed university hospital in Bangkok. All parturients who underwent antenatal care had routine voluntary antenatal HIV screening after pre-test counselling. After the result of testing was known, post-test counselling was given to all pregnant women, either positive or negative HIV testing. All HIV-infected adolescent parturients subsequently underwent follow up in a High-Risk Pregnancy clinic. The information of these adolescent pregnancies were recorded in antenatal care and delivery records. For each HIV-infected adolescent, two seronegative adolescent control were randomly chosen by random digit method. For the purpose of this study, "adolescent" is defined as a patient in the age group 15 to 20 years.

Laboratory : Blood specimens were screened for HIV-1 antibody with gelatin particle agglutination technique. Specimens which were found reactive by this technique were examined again for comfirmation by enzyme-linked immunosorbent assay (ELISA) and Western Blot technique. Those who were seropositive at the first screening test were referred to a High-Risk Pregnancy clinic and another sample was drawn for repeated GPA testing. Both reactive specimens with these techniques were considered HIV-1 seropositive.

Variables : The variables of this study are composed of age, education, contraceptive use prior to pregnancy, gravida, history of abortion, body weight at first visit, haematocrit and VDRL.

Data analysis : All data were recorded onto PC microcomputer 486/DX and analysed with statistic package program CIA and microstat. The statistic values are mean, standard deviation, odd ratio and 95% confidence interval. The analytic statistics are Student's T-test, Fisher's exact test and odd ratio. Significance is expressed at the 0.05 level.

Period of study : The period of study was from January 1, 1991 to March 31, 1996, a total period of 63 months.

Results

During the study period, 2,634 cases of adolescent pregnancy registered for prenatal care. All of them agreed to have HIV testing after pre-test counselling voluntarily. The adolescent parturients who underwent HIV screening, 32 were found to have HIV infection after the confirmation test. The prevalence rate of HIV-1 infection among this adolescent group was 1.21%. All of them were asymptomatic and none had previously known history of their infectious status. A total of 64 seronegative controls were randomly chosen to compare with seropositive patients. The mean age of seropositive adolescents were 18.58 ± 1.48 years and seronegative were 18.51 ± 1.52 years. There was no significant difference between mean age of these two groups. Table 1 shows the demographic characteristics of pregnant adolescents. There were no difference of HIV infection between age below and above 18 years old as well as housewives and other occupations among adolescent

parturients. However, mothers who had education less than 6 years were more likely to be infected than mothers who had education more than 6 years (OR = 4.33, 95% CI 1.57-11.9, Fisher's exact test P < 0.05). Table 2 shows some risk factors of seropositive pregnant adolescents. The odd ratio of adolescent parturients who were primigravida, no history of abortion and haematocrit at first visit less than 30% was higher than adolescent parturients who were multigravida, previous history of abortion and haematocrit at first visit more than 30%, but the differences were not statistical significance. However, the adolescent parturients who did not use contraception prior to this pregnancy were more likely to be infected (OR = 3.57, 95% CI 1.35-9.43, Fisher's exact test P < 0.05) than adolescent parturients who used contraception. The contraceptive methods used among these adolescents were only oral contraceptive pill and condom. There were 4 cases used condom and 3 cases used oral pill in the HIV seropositive group. In the seronegative group, there were 17 cases used condom and 15 cases used oral pill. Adolescent parturients who had positive VDRL were significantly associated with HIV seropositive (OR = 5.87, 95% CI 1.64-20.9, Fisher's exact test P < 0.05). Adolescent parturients whose body weight below 50 kilograms and those > 50 kilograms had no association with HIV infection.

Discussion

Our study showed that the important risk factors for HIV-1 infection among adolescent parturients in Ramathibodi Hospital included education less than 6 years, no contraception prior to this pregnancy and positive VDRL. The highly educated adolescent parturients in this study were less likely to be infected with HIV because there were several educational programmes on AIDS prevention in secondary schools, vocational schools and colleges by Ministry of Education and Ministry of Public Health. Adolescents who were in schools and colleges might be encouraged to protect themselves from HIV infection due to impact of these programmes.[3,4] Some contraceptive methods were also protective against HIV infection.[5] The

Table 1. Selected demographic characteristics of seropositive and seronegative pregnant adolescents

Characteristics	Seropositive (n = 32)	Seronegative (n = 64)	Odd ratio	95% Confidence interval
Age (years)				
< 18	15	31	0.94	0.40 - 2.20
19-20	17	33	1	
Education (years)*				
0-6 years	26	32	4.33	1.57 - 11.90
> 6 years	6	32	1	
Occupation				
Housewives	17	35	0.94	0.40 - 2.20
Other	15	29	1	

* Significant at 95% confidence interval

Table 2. Risk factors of seropositive pregnant adolescents

Risk factors	Seropositive (n = 32)	Seronegative (n = 64)	Odd ratio	95% Confidence interval
Gravida				
1	23	37	1.86	0.75 - 4.66
> 1	9	27	1	
Abortion				
No	23	40	1.53	0.61 - 3.86
Yes	9	24	1	
Contraceptive use prior to this pregnancy*				
No	25	32	3.57	1.35 - 9.43
Yes	7	32	1	
Haematocrit at first visit				
< 30%	5	5	2.19	0.58 - 8.19
> 30%	27	59	1	
VDRL*				
Positive	9	4	5.87	1.64 - 20.9
Negative	23	60	1	
Body weight at 1st visit				
< 50 kilograms	22	34	1.94	0.79 - 4.75
> 50 kilograms	10	30	1	

* Significant at 95% confidence interval

contraceptive methods among these adolescents prior to pregnancy were condom and oral contraceptive pill. As we know, condom can prevent sexually transmitted disease as well as HIV infection.[5] However, oral pill is still a controversy whether it has any association with HIV infection.[5-7] We found that positive VDRL was a risk factor of HIV infection among these adolescent pregnancy. Several studies showed association between HIV infection and sexually transmitted disease including syphilis.[8-18]

This study has limitation due to of small sample size of seropositive cases. In addition, we were unable to describe the characteristics and behaviors of sexual partners which may be a crucial determinant of HIV infection among these adolescent parturients. We would encourage others to investigate risk factors of these adolescent sexual partners. The outcome might be valuable for AIDS control programme among these adolescents.

In summary, this study revealed the important risk factors for HIV-1 infection among adolescent parturients in Ramathibodi hospital. Education, contraception and prevention of sexually transmitted disease might decrease risk of HIV infection in this group of population.

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