

Seroprevalence of Human Immunodeficiency Virus in Patients with Ectopic Pregnancies

Pallop Pongsuthirak MD, *[†]
Teraporn Vutyavanich MD, MSc, *
Chatchawan Apichartpiyakul MSc, [#]
Vicharn Vithayasai MD, PhD, [#]
Waraporn Piromiertamorn BSc. *

*Department of Obstetrics and Gynaecology and

[#]Department of Microbiology, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200, Thailand.

[†] Present Address: Department of Obstetrics and Gynaecology, Buddhachinraj Hospital, Pisanuloke.

Abstract : *Objective : To determine the prevalence and risk factors of human immuno deficiency virus (HIV) infection in a population of patients with ectopic pregnancies. Design : Retrospective anonymous survey of clinical data and anonymous screening of HIV antibody by an indirect enzyme-linked immunoabsorbent assay (ELTSA, Abbott[®]) in stored sera. Positive sera were further tested by another indirect ELISA (Vironostika[®]) before proceeding to Western blot assay. Statistical analyses were performed using Student's t-test and Chi-square test when appropriate. Prognostic factors were studied in a stepwise logistic regression model. The results were considered significant at a value of $P < 0.05$. Setting : Department of Obstetrics & Gynecology in a university tertiary care center Participants : Based on availability of stored frozen sera. The study population included 210 out of 262 consecutively diagnosed ectopic pregnancies between January 1, 1990 and November 30, 1992. Results : Out of the 210 sera tested, 10 were found positive for HIV antibody. Stepwise logistic regression analysis revealed that age, number of sexual partners and history of infertility were significant predicting factors for HIV status. Conclusion : The relatively high HIV seroprevalence of 4.3%, with a 90% confidence interval between 2-6.6% suggests that HIV counselling and education should be offered to all such patients. An alternative way is to screen patients with a history of infertility and/or those with ≥ 2 sexual partners, which will detect 89% of cases and yet reduce the cost of routine testing by >50% (Thai J Obstet Gynaecol 1995;7:123-129)*

Key words : HIV prevalence, ectopic pregnancies, risk factors.

Short title : HIV in ectopic pregnancies.

Acquired immuno deficiency syndrome (AIDS) is a fatal, infectious disease for which there is as yet no cure. Although the disease was first reported among homosexual men and intravenous drug abusers, current evidence suggests that the proportion of patients who have been infected through heterosexual contact are on the increase.^(1,2) A promiscuous pattern of sexual behavior is well known as a risk factor for many sexually transmitted diseases (STDs) including AIDS.⁽²⁾ Since tubal damage as a result of past pelvic infection is a common cause of ectopic pregnancy, it raises the question whether patients with ectopic pregnancies are also a high risk group for human immunodeficiency virus (HIV) infection. In this study, we conducted a preliminary survey of HIV seroprevalence in patients with ectopic pregnancies.

Materials and Methods

The study population consisted of 262 consecutive cases with ectopic pregnancies, who were admitted to our University Hospital from January 1, 1990 to November 30, 1992. All patients had blood drawn for routine laboratory investigations and for β -hCG testing. The excess sera from routine laboratory investigations were kept frozen at -70°C until analysed for HIV antibody. Stored sera were not enough or not available in 52 cases, leaving 210 frozen samples for HIV testing. Clinical data of patients were

obtained from information previously collected in another prospective descriptive study of clinical signs, symptoms and findings of ectopic pregnancies in this hospital. To ensure anonymity, a research nurse not involved in this study randomly assigned linked code numbers to patient data and serum samples. Patient identities were then deleted from both sample tubes and records. After this, any connection between patient identifications and code numbers were destroyed. The technician who performed HIV testing knew only the code numbers of sera and reported the results only to one of the investigators who performed statistical analysis of the data. This investigator, who did not take part in patient care or interview, was the only person to gain access to patients' (without patient identifications) and the test results with only linked code numbers.

All serum samples were screened for HIV antibody using Abbott® indirect enzyme link immunoabsorbent assay (ELISA) kit. All reactive samples were confirmed with Vironostika® indirect ELISA kit before proceeding to Western blot assays. Statistical analyses were performed using BMDP programs on an IBM PC. Two group student's t-test and Chi-square test were used when appropriate. Potential risk factors were evaluated in a stepwise logistic regression model. The results were considered significant at a value of $P < 0.05$.

Results

Results of HIV tests were available for 210 out of 262 consecutive sera of patients with ectopic pregnancies. Two cases in this report had 2 episodes of ectopic pregnancy, one of whom tested positive for HIV antibody on both occasions. No

seroconversion occurred in the other patient during the period of this study. Ten out of the 210 samples were positive for HIV antibody, giving a seroprevalence rate of 4.76% of samples or 4.3% (9 out of 208) of all patients.

Cases who tested positive for HIV antibody were significantly

Table 1 *Results of HIV testing in patients with ectopic pregnancies*

| | HIV Status | | P Value |
|---|----------------|----------------|---------|
| | Negative | Positive | |
| Age (mean \pm SD) | 27.9 \pm 5.4 | 23.4 \pm 3.7 | 0.0147 |
| Occupation | | | 0.5617 |
| Employee | 77 | 4 | |
| Agriculture | 34 | 2 | |
| Civil Service | 18 | 0 | |
| Merchant | 33 | 0 | |
| Housewife | 25 | 3 | |
| Student | 9 | 0 | |
| Prostitute | 2 | 0 | |
| Unemployed | 1 | 0 | |
| Parity | | | 0.2307 |
| 0 | 101 | 7 | |
| 1 | 68 | 2 | |
| ≥ 2 | 30 | 0 | |
| Number of Sexual Partners | | | 0.0109 |
| 1 | 159 | 5 | |
| 2 | 34 | 2 | |
| > 2 | 6 | 2 | |
| Duration of sexual exposure in years (mean \pm SD) | 7.2 \pm 5.6 | 4.9 \pm 3.7 | 0.2038 |
| History of Infertility | 65/199 | 5/9 | 0.1551 |
| History of Pelvic Inflammatory Disease (PID) | 31/199 | 1/9 | 0.7164 |
| Contraception | | | 0.2085 |
| None | 147 | 9 | |
| Barrier | 7 | 0 | |
| Nonbarrier | 45 | 0 | |
| Pelvic pathology suggestive of past PID | 50/199 | 3/9 | 0.5805 |
| Total patients | 199 | 9 | 208 |

younger than those who tested negative (Table 1). There was also a statistically significant difference in the number of sexual partners in both groups. Univariate tests revealed that other factors such as occupation, parity, duration of sexual exposure, history of infertility, history of pelvic inflammatory disease (PID) and contraceptive methods were comparable in the two groups. (Table 1).

When multivariate analysis was performed using age (in years), parity (0, 1 and ≥ 2), number of sexual partners (1, ≥ 2), duration of sexual exposure (in years), history of infertility (no, yes), contraception (none, barrier and nonbarrier methods) and

pelvic pathology suggestive of past PID (no, yes) as independent variables and HIV status as dependent variable in a stepwise logistic regression model, only age, number of sexual partners and history of infertility emerged as significant predicting factors (Table 2). Younger patients were at increased risks ; the odds of having positive HIV serology was 9.1 times in patients with sexual partners ≥ 2 , compared with those who had only one sexual partner ; similarly, the odds was 6.4 times in those with a history of infertility compared with those without infertility.

The number of patients screened and the number of those who

Table 2 *Summary of stepwise logistic regression analysis*

| Step Term Entered No. | DF | Log Likelihood | Improvement Chi-square | P-value |
|--------------------------|----|-------------------|---------------------------|---------|
| 0 | | - 40.203 | | |
| 1 Age | 1 | - 36.627 | 7.153 | 0.007 |
| 2 No. of sexual partner | 2 | - 33.188 | 6.878 | 0.032 |
| 3 History of infertility | 1 | - 29.948 | 6.479 | 0.011 |

Table 3 *Numbers of patients with risk factor (s) and those who tested positive for HIV antibody*

| Risk factor (s) | HIV status | | |
|------------------------------|------------|----------|-------|
| | Negative | Positive | Total |
| Age ≤ 24 (F1) | 60 | 5 | 65 |
| Sexual partner ≥ 2 (F2) | 40 | 4 | 44 |
| History of infertility (F3) | 65 | 5 | 70 |
| F1 and/or F2 | 96 | 8 | 104 |
| F1 and/or F3 | 113 | 7 | 120 |
| F2 and/or F3 | 90 | 8 | 98 |
| F1 and/or F2 and/or F3 | 136 | 9 | 145 |

tested positive for HIV antibody when the three predicting factors, either alone or in combination, were used as the screening criteria are shown in Table 3.

Discussion

Studies of HIV seroprevalence in women have been conducted in several settings and populations such as in women attending family planning clinics, prenatal clinics, sexually transmitted disease clinics, drug treatment centers, premarital testing programs, blood donor and infertility clinics.⁽²⁻⁵⁾ This report, as far as we know, represents the first study of HIV seroprevalence specifically among patients with ectopic pregnancies. To avoid the possible bias that volunteers have more high risk behavior than non volunteers,⁽⁶⁾ we tested all available sera left over from routine laboratory investigations. It is unlikely that there was bias in patient recruitment because testing was based solely on availability of sera, which occurred at random and out of the control of patients and investigators. Since the screening covered more than 80% of consecutive cases, it should fairly well reflect the true prevalence of HIV infection in this population.

Our data are in agreement with others who report that multiple sexual partners is a predisposing factor for HIV infection.^(5,7) The reason why seropositive patients in this study are younger than seronegative cases is not

known. Many possibilities exist ; for example, male partners of these patients may also be younger and more promiscuous than those of the other group or these couples may have other high risk behavior that include intravenous drug use. It is unfortunate that the history of intravenous drug abuse is unknown in our patients to either confirm or refute the above hypothesis. It is also interesting to note that the history of infertility, after adjusting for age and multiple sexual partners, emerges as a significant predicting factor (odds ratio = 6.4). It is possible that other risk factors exist but we may have missed them because this study includes only 9 seropositive cases and does not, therefore, have enough statistical power to show a significant difference in other factors if they indeed exist.

In this preliminary survey, the prevalence of HIV positive sera among patients with ectopic pregnancies is 4.3%, with a 90% confidence interval between 2% to 6.6%. Such a high prevalence of HIV infection raises the issue whether these patients should be considered a high risk group and whether routine HIV testing should be done. Considering the fact that these patients are carrying the virus asymptotically and that they are in the reproductive age group, it is apparent that they have a great potential to spread HIV infection to their sexual partners, prospective children and health care personnel. Although such consideration would favour routine

screening in all cases, there are valid and strong arguments against this approach, such as the cost involved, the possibilities of labeling, stigmatization and loss of employment.⁽⁸⁾ In addition, knowledge of HIV infection per se may not influence the patients' decision to change their behavior and to avoid pursuing conception.⁽⁹⁾ Moreover, negative test result does not guarantee an HIV-free status. For these reasons, we believe counselling and education should be made available to all such patients so that they can make their own decision regarding an HIV testing and their future reproductive performance. On the part of health care personnel, we would recommend that universal precaution be strictly observed in the care of all patients with ectopic pregnancies.

One attractive alternative is to screen patients by risk factors. If we use the three predicting factors, either alone or in combination, as screening criteria, we will be able to detect 100% of cases and yet reduce the cost of screening tests by at least 30%. Similarly, history of infertility and/or sexual partners ≥ 2 as screening criteria will enable one to detect 89% of cases and cut down the expense of testing by more than half. These risk factors need to be further assessed in a larger study before one can recommend them for general use.

Conclusion

In this preliminary cross-

sectional survey of HIV seroprevalence among patients with ectopic pregnancies, we found a seropositive rate of 4.3%. However, to really ascertain that the prevalence of HIV in this population is around 5%, with a 90% confidence interval between 4-6%, a larger study involving around 1,300 patients will be needed. Nevertheless, until a more accurate prevalence in this population is known, we believe HIV counselling and education should be offered to all such patients.

Acknowledgement

HIV test kits were donated by the Tasmanian Blood Bank through the Australian federation of AIDS Organization Inc.

References

1. Centers for Disease Control update : Acquired immunodeficiency syndrome- United States, 1981-1988. MMWR 1989; 38:229.
2. Shapiro CN, Schulz SL, Lee NC, Dondero TJ : Review of human immunodeficiency virus infection in women in the United states. Obstet Gynecol 1989; 74:800-814.
3. Balasch J, Coll O, Pumarola T, Vanrell JA, Jove IC : Prevalence of human immunodeficiency virus in and infertile population. Fertil Steril 1991;56:1025-1028.
4. Bray MA, Minkoff H, Soltes B, Sierra MP, Clarke L, Reyes FI: Human immunodeficiency virus-1 infection in an infertile population. Fertil Steril 1991;56: 16-19.
5. Safrin S, Dattel BJ, Hauer L, Sweet RL : Seroprevalence and epidemiologic

correlates of human immunodeficiency virus infection in women with acute pelvic inflammatory disease. *Obstet Gynecol* 1990;75:666-670.

6. Sperling RS, Friedman F Jr, Joyner M, Brodman M, Dottino P : Seroprevalence of human immunodeficiency virus in women admitted to hospital with pelvic inflammatory disease. *J Reprod Med* 1991;36:122-124.
7. Peterman TA, Cates W Jr, Curran JW : The challenge of human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) in women and children. *Fertil Steril* 1988; 49:571-581.
8. Bayer R : Perinatal transmission of HIV infection : the ethics of prevention. *Clin Obstet Gynecol* 1989;32:497-505.
9. Selwyn PA, Schoenbaum EE, Davenny K, et al. : Prospective study of human immunodeficiency virus infection and pregnancy outcomes in intravenous drug users. *JAMA* 1989;261:1289-1294.