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Structure of Gynecological Diseases and Comorbidity in Women with HIV Infection and Reproductive Disorders

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Abstract

Background: The increase in the number of HIV-infected women of fertile age, as well as their reproductive plans to have healthy children, was the reason for studying the features of reproductive health disorders and comorbid conditions in women with HIV infection.

Methods and Results: Women meeting the inclusion criteria were divided into two groups: Group 1 included 27 HIV-infected women (average age of 30.8±2.9 years) with reproductive disorders; Group 2 included 23 HIV-infected women (average age of 31.4±7.1 years) without reproductive disorders. In study groups, the main route of HIV transmission was sexual contact. When assigning women to a particular category (fertile or infertile), the WHO classification of fertility was used: fertile, presumably fertile, primarily infertile, secondarily infertile, women with unknown fertility. There was a statistically significant difference in the incidence of medical abortion in Group 1 [14(60.9%)] than in Group 2 [8(29.6%)] (P=0.026). There were no statistically significant differences in the incidence of chronic co-morbidities (ENT disorders, gastritis/duodenitis, pancreatitis, cystitis, viral hepatitis (B, C), papillomavirus infection) in Groups 1 and 2 (P>0.05). The incidence of pelvic inflammatory diseases was 2 times higher in Group 1 than in Group 2. No statistically significant differences in the incidence of uterine myoma, chronic cervicitis, chronic endometritis, vulvovaginal candidiasis,, and cervical dysplasia were found. A significant prevalence of chronic salpingo-oophoritis, secondary dysmenorrhea, secondary amenorrhea, opsomenorrhea, and secondary oligomenorrhea was detected significantly more frequently in Group 1 than in Group 2. The syndrome of hyperprolactinemia was also 2.6 times more frequent in Group 1 than in Group 2. Reproductive disorders in HIV-infected women were associated with a high incidence of STI combinations (trichomoniasis, gonorrhea, syphilis, chlamydia).

Conclusion: Early detection of menstrual dysfunctions, prevention of abortion and sexually transmitted diseases, and timely treatment of infertility, are essential for women living with HIV.(**International Journal of Biomedicine. 2022;12(1):120-123.**)

Key Words: fertility • infertility • HIV infection • comorbidity

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Introduction

In recent years, the proportion of HIV-infected women has been increasing, and the role of sexual transmission is increasing, as well as the active involvement of women of reproductive age in the HIV epidemic.[1,2] HIV infection can reduce the fertility of women at any stage of the disease; menstrual cycle and ovulation disorders, decreased ovarian reserve and oocyte quality have been reported.[3,4] Hormonal disorders are an important link in the pathogenesis of many disorders, including reproductive,[5] and may also contribute to the more rapid development of acquired immunodeficiency syndrome (AIDS), so monitoring of this system provides additional information on opportunities and ways to prevent the progression of HIV infection, and improve the possibility of giving birth to a healthy child.[6,7] The increase in the number of HIV-infected women of fertile age, as well as their reproductive plans to have healthy children, was the reason for studying the features of reproductive health disorders and comorbid conditions in women with HIV infection.

Materials and Methods

We performed a cross-sectional study of 83 women of reproductive age with HIV stage 4B. Inclusion criteria were age 18-45; HIV infection stage 4B, diagnosed on the basis of epidemiological, clinical data and confirmed by detection of specific antibodies by ELISA and immune blotting to HIV type 1 proteins; signature of informed consent; regular sexual activity for a year in the absence of contraception. Exclusion criteria were anything that would place the individual at increased risk or preclude the individual's full compliance with or completion of the study; history of hysterectomy, bilateral oophorectomy; HIV-infected women with unknown fertility.

Women meeting the inclusion criteria were divided into two groups: Group 1 included 27 HIV-infected women (average age of 30.8±2.9 years) with reproductive disorders; Group 2 included 23 HIV-infected women (average age of 31.4±7.1 years) without reproductive disorders. In study groups, the main route of HIV transmission was sexual contact.

When assigning women to a particular category (fertile or infertile), the WHO classification of fertility was used: fertile (women who had a pregnancy during the current year), presumably fertile(women who had a history of pregnancy more than 1 year ago), primarily infertile(women who did not have a history of pregnancy, despite regular sexual contact during the year and provided that no contraceptive methods were used), secondarily infertile(infertile women with a history of pregnancy), women with unknown fertility(women with no history of pregnancy due to the use of contraceptive methods, and/or with irregular sexual contact).

All women answered a questionnaire survey (menarche, parity, live-births, abortions, missed abortions, use of hormonal or other contraceptives, gynecological operations) and underwent general clinical, gynecological, and laboratory-instrumental examination.

Blood samples (5 ml) were collected from the ulnar vein in standard vacuum tubes with EDTA in the morning after night fasting, taking into account the phases of the menstrual cycle or amenorrhea. The levels of prolactin, luteinizing hormone, follicle-stimulating hormone, testosterone, cortisol, 17-OH progesterone, estradiol, thyroid-stimulating hormone, free triiodothyronine, free thyroxine, progesterone, dehydroepiandrosterone sulfate, anti-müllerian hormone were assessed by competitive solid-phase enzyme immunoassay using test system "ALKOR-BIO" on a Cobos ELL immunoassay analyzer (USA).

The percentages and absolute counts of blood lymphocytes (CD3+ and CD4+ cells) were determined by the method of indirect immunofluorescence with monoclonal antibodies using the BD FACSCalibur flow cytometer (USA).

The diagnosis of HIV infection was made on the basis of epidemiological and clinical data and was confirmed by the detection of specific antibodies by ELISA and immune blotting for HIV type 1 protein.

Statistical analysis was performed using the Statistica 8.0 software package (Stat-Soft Inc., USA). The normality of the distribution of continuous variables was tested by a one-sample Kolmogorov-Smirnov test. Continuous variables with normal distribution were presented as the mean and standard error of the mean [SEM]. Means of 2 continuous normally distributed variables were compared by independent samples Student's t-test. Mann-Whitney U test was used to compare means of 2 groups of variables not normally distributed. The frequencies of categorical variables were compared using Pearson's chi-squared test or Fisher's exact test (2-tail), when appropriate. A value of $P<0.05$ was considered significant.

The study was approved by the Ethics Committee of the Scientific Center for Family Health and Human Reproduction Problems. Written informed consent was obtained from each participant.

Results and Discussion

Group 1 consisted of women with primary and secondary infertility. Group 2 consisted of fertile and presumably fertile women. The HIV status of women in both groups did not differ (Table 1).

Table1.

Characteristics of HIV status in women with reproductive disorders

Indicators	Group 1 n=23	Group 2 n=27	*P*-level
Mean duration of HIV infection	10.0±1.5	8.0±2.5	0.496
HAART	8(34.8%)	11(40.7%)	0.666
STI	18(78.3%)	24(88.9%)	0.307
Parenteral route of HIV transmission	5(21.7%)	3(11.1%)	0.444

In Groups 1 and 2, the mean duration of the HIV infection was 10±1.5 years and 8±2.5 years, respectively ($P>0.05$). Highly active antiretroviral therapy (HAART) was received by 35% of women in Group 1 and 40% women in Group 2. The main route of transmission was sexual in the 2 groups.

According to the active detection of infertility in the Irkutsk region, the proportion of infertile women in a healthy population was 19.56±1.1%, primary infertility - 32.5±0.7%, secondary infertility - 67.5±0.7%.[8] Comparing the data obtained in our study, the fertility status of HIV-infected women is characterized by a low level.

In a study by Zaba et al.,[9] fertility of HIV-positive women was lower than that of HIV-negative women in all except the youngest age group. This controversial observation has been attributed to earlier sexual activity in this patient group. Comparison with the general female population showed that fertility in HIV-infected women was 40% lower than in uninfected controls. Decreased fertility rates in HIV-infected women have been described in the United States in more recent studies.[10-12] Kushnir et al.[3] concluded that psychosocial factors, in addition to biological alterations in reproductive physiology, might affect reproductive desires in HIV-infected patients.

In our study, a parity analysis of HIV-infected women in Group 1 revealed the following: anamnesis births in 56% (in women with secondary infertility), pregnancy failure in 17%, medical abortion in 61%, ectopic pregnancy in 8%, complications after medical abortion and delivery in 25%, primary infertility in 43%, secondary infertility in 57%. There was a statistically significant difference in the incidence of medical abortion in Group 1 [14(60.9%)] than in Group 2 [8(29.6%)] (P=0.026).

Comorbid conditions in HIV-infected women are presented in Table 2. There were no statistically significant differences in the incidence of chronic co-morbidities (ENT disorders, gastritis/duodenitis, pancreatitis, cystitis, viral hepatitis (B, C), papillomavirus infection) in Groups 1 and 2 (P>0.05). The incidence of pelvic inflammatory diseases was 2 times higher in Group 1 than in Group 2.

Table 2.

Comorbid conditions n (%) in HIV-infected women

ICD-10 codes	Group 1 n=23	Group 2 n=27	P-level
Chronic diseases of the tonsils - J35.0	10(43.5%)	15(55.6%)	0.394
Chronic gastritis/duodenitis - K 29.5	5(21.7%)	7(25.9%)	0.730
Chronic viral hepatitis B - B18.1 Chronic viral hepatitis C - B18.2	11(47.8%)	12(44.4%)	0.811
Chronic pancreatitis - K86.1	3(13.0%)	4(14.8%)	1
Chronic cystitis - N30.1	2(8.7%)	4(14.8%)	0.674
STI combinations -Chlamydial infection of pelvi-peritoneum and other genitourinary organs - A56.1 -Gonococcal infection of lower genitourinary tract without periurethral or accessory gland abscess - A54 -Latent syphilis, unspecified as early or late - A53 -Urogenital trichomoniasis - A59	15(65.2%)	9(33.3%)	0.024
Papillomavirus - B97.7	10(45%)	12(40%)	0.944

The structure of gynecological diseases is presented in Table 3. No statistically significant differences in the incidence of uterine myoma, chronic cervicitis, chronic endometritis, vulvovaginal candidiasis, and cervical dysplasia were found. A significant prevalence of chronic salpingo-oophoritis, secondary dysmenorrhea, secondary amenorrhea, opsomenorrhea, and secondary oligomenorrhea was detected significantly more frequently in Group 1 than in Group 2. The syndrome of hyperprolactinemia was also 2.6 times more frequent in Group 1 than in Group 2.

Biological changes in reproductive physiology may explain the lack of fertility in HIV-infected women.[4,5] Systemic disease, stress, weight loss, and substance abuse can affect reproductive potential.[13-15] HIV-infected women are more likely to suffer from prolonged anovulation and amenorrhea;[3,4,16] the mechanisms underlying this clinical observation are unknown and debated. However, there are studies that have found no association between HIV infection and amenorrhea after adjusting for age, body mass index, and substance use.[3] The number of ovulatory cycles and frequency of sexual intercourse correlate with the severity of HIV/AIDS clinical status and can obviously affect fertility and may reflect the degree of depletion and immunosuppression.[3,4] A direct link between HIV and gonadal deficiency in men and women has been suggested, but no evidence for this hypothesis is yet available.

Table 3.

Gynecological diseases n (%) in HIV-infected women

ICD -10 codes	Group 1 n=23	Group 2 n=27	P-level
Moderate cervical dysplasia - N87.1	7(30.4%)	4(14.8%)	0.305
Chronic salpingo-oophoritis - N70.1	15(65.2 %)	8(29.6%)	0.012
Secondary amenorrhea - N92.1	5(21.8%)	0	0.016
Opsomenorrhea - N91.3	6(26.1 %)	1(3.7%)	0.039
Secondary oligomenorrhea - N91.4	8(34.8%)	2(7.4 %)	0.030
Cervicitis - N72	12(52.2%)	8(29.6%)	0.105
Chronic vulvovaginitis - N76.1	14(60.9%)	11(40.7 %)	0.156
Chronic inflammatory diseases of the uterus - N71.1	9(39.1%)	3(11.1 %)	0.044
Secondary dysmenorrhea - N94.5	16(69.6%)	10(37.0 %)	0.022
Myoma of the uterus - D25.1	1(4.3%)	2(7.4%)	1
External genital and vaginal candidiasis - B37.3	12(52.2%)	10(37.0 %)	0.283
Hyperprolactinemia - E22.1	13(56.5%)	5(18.5 %)	0.008
Female infertility associated with anovulation - N97.0	7(30.4%)	0	0.002

In our study, reproductive disorders in HIV-infected women are associated with a high incidence of gynecological and endocrine pathology: secondary dysmenorrhea, pelvic inflammatory disease, STI combinations (trichomoniasis, gonorrhea, syphilis, chlamydia), hyperprolactinemia, anovulation, oligomenorrhea, and secondary amenorrhea. As more and more young HIV-infected patients live longer, reproductive problems are becoming more prominent in public health. It can be concluded that fertility treatment is a relevant option for HIV-infected couples. Future treatments should be designed to help minimize the risk of HIV transmission and improve understanding of the impact of HIV and its treatments on fertility and reproductive competence.

Competing Interests

The authors declare that they have no competing interests.

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