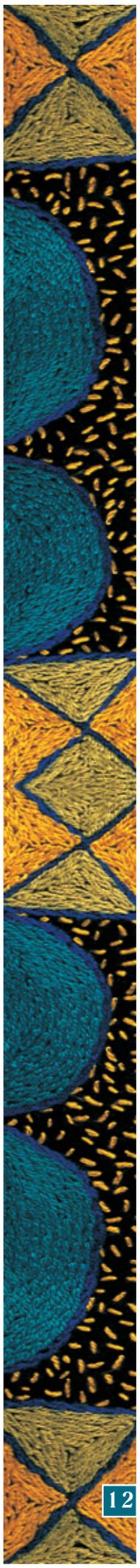

PREVENTION

DECREASED SEXUAL RISK BEHAVIOUR AFTER THE DIAGNOSIS OF HIV AND INITIATION OF ANTIRETROVIRAL TREATMENT – A STUDY OF PATIENTS IN JOHANNESBURG

Julia Fougelberg, *Medical Student*
Sofie Karlström, *Medical Student*
Department of Infectious Diseases, Sahlgrenska Academy, Göteborg University, Gothenburg, Sweden

Yosuf Veriava, *MB BCh, FCP (SA), FRCP (Lond)*
Prudence Ive, *MB BCh, FCP (SA)*
Helen Joseph Hospital, Johannesburg, South Africa

Rune Andersson, *PhD, MD*
Department of Infectious Diseases, Sahlgrenska Academy, Göteborg University, Gothenburg, and Research and Development Centre, Skaraborg Hospital, Skövde, Sweden

Objectives. An extended programme for free antiretroviral treatment (ART) of HIV was launched in South Africa in April 2004. It is essential to assess the effects on sexual risk behaviour.

Design and setting. A questionnaire was distributed to patients on ART at Helen Joseph Hospital, Johannesburg, between 17 January and 22 February 2005.

Results. The percentage of men who had sexual contacts outside their relationship decreased from 48% before HIV diagnosis to 11% after starting ART. Condom use with casual partners increased from 53% among the men and 46% among the women before the diagnosis of HIV to 87% and 81% respectively on ART.

The majority of patients were tested for HIV because they presented with symptoms of illness. We noted no significant difference in disclosure rate after the start of ART. All participants were positive about the treatment and felt physically better. The majority of the patients experienced a better quality of life.

Conclusions. The ART had an overall positive effect on health with no increase of sexual risk behaviour.

THE FREE HIV TREATMENT PROGRAMME IN SOUTH AFRICA

An extended free antiretroviral treatment (ART) programme was launched in April 2004, as part of the Comprehensive National Plan on HIV and AIDS Care, Management and Treatment. The aim is to provide access to antiretroviral treatment to more than 1.4 million South Africans by 2008.

The primary goals of the free treatment programme are to diminish HIV/AIDS-related deaths and to decrease the incidence of HIV-related opportunistic infections. Another goal is to decrease the incidence of HIV. It is hoped that this target will be met thanks to an increase in voluntary testing and counselling, which will lead to more people knowing about their status and practising safer sex. Further, it is envisaged that HIV prevalence in children will decrease because of prevention of mother-to-child transmission.

METHOD

The study was conducted between 17 January and 22 February 2005 at the HIV clinic at Helen Joseph Hospital in Johannesburg, South Africa.

The inclusion criteria for the study were:

- Age over 18 years
- HIV positive
- Having received ART for 4 - 12 months
- Agreement to participate in the study.

After ethics approval was sought from the Human Research and Ethics Committee of the University of the Witwatersrand and the patients had signed for consent, they were asked to answer a questionnaire. The questionnaire consisted of 21 questions concerning age, sex, level of education, time since diagnosis of HIV, reason for HIV test, disclosure of HIV status

before and after ART, HIV test of partner and children, adherence to ART, subjective effects of ART, and number of partners and use of condoms before HIV test, between HIV test and ART and during ART. The information sheet and questionnaire were in English, and patients who had difficulties in speaking English were excluded.

All data were handled confidentially. Each questionnaire was registered with a number linked to a confidential list of patient names, to which only the research group had access.

STATISTICAL METHODS

The following formula was used for calculating 95% confidence intervals(CIs): SEM (p) = √(p*(100-p))/n; 95% CI = p +/- SEM(p)*1.96 are used. The formula is applicable when p*n ≥ 500 and (100-p)*n ≥ 500. (p = proportion in %, n = number of observations, SEM = standard error of the mean.[1]) For proportions where the formula was not applicable, the CIs were calculated by a statistician using the computer program for binominal distribution.

RESULTS

GENERAL INFORMATION

Age and sex

A total of 123 patients participated. Sixty-nine per cent were women compared with 31% men ($p < 0.01$). The mean age was 35.1 years (men 33.7 years, women 35.7 years). The median age was 34 years.

The reason for HIV testing was a general feeling of illness for 61% of the men and 53% of the women. Twenty-six per cent of the men and 9% of the women were tested because they had an HIV-positive partner, and 20% of the women were tested as part of routine pregnancy testing.

Education

Fifty-seven per cent of the participants had secondary school as their highest level of education. There were more men than women with university or college degrees (28% v. 9%), as well as a higher percentage of non-educated men (16% v. 9%). None of these differences were statistically significant. The exclusion of patients who did not speak English means that patients with limited education did not participate in the study. A few patients who could not read English were assisted by the study team.

Partner and children

Seventy per cent of the men and 59% of the women reported that they had a current partner (NS). There were only two options to choose from in the question about partnership (partner/no partner). There was no choice for widows.

Ninety-one per cent of the women and 76% of the men had children (NS). The average number of children was 2.1 for men and 2.4 for women. Number of children ranged from 1 to 7. Eighty-three per cent of the men and 73% of the women reported that their partner has been tested for HIV (NS). There was a tendency towards the female group having been diagnosed a longer time ago than the male group. Fifty-eight per cent of the women and 27% of the men had had their HIV test more than 2 years ago ($p < 0.01$).

Disclosure

Before the start of treatment 18% (95% CI 6.1 - 34.3) of the men and 9% (95% CI 3.2 - 17.7) of the women had disclosed their HIV status to no one.

After the start of ART, 64% of the men and 51% of the women had told their partners (NS).

As demonstrated in Figs 1 and 2, men and women reached the same level of disclosure to sisters/brothers and friends, but more disclosures for men to friends were noted after start of ART ($p < 0.05$).

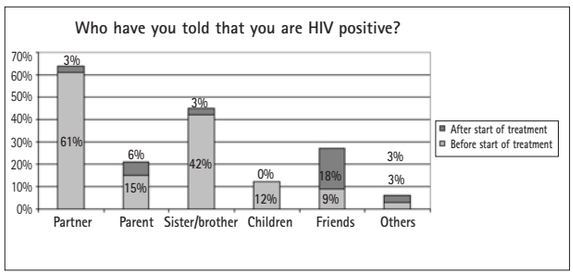

Fig. 1. Disclosure of HIV status among 38 men.

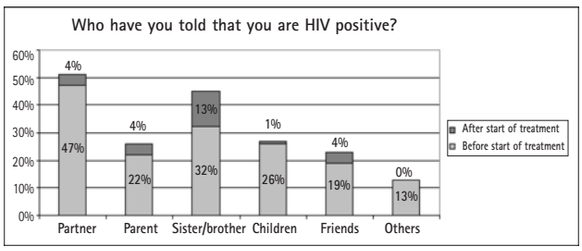

Fig. 2. Disclosure of HIV status among 85 women.

Antiretroviral treatment

The first-line treatment was stavudine + lamivudine + efavirenz or nevirapine. The second-line treatment was zidovudine + didanosine + lopinavir/ritonavir.

The duration of the treatment ranged from 4 to 12 months. Both mean and median numbers were higher for women than for men (6.6 and 6, 5.9 and 5 months).

Sexual behaviour

Fifty per cent of the men and 40% of the women believed they were more infectious to others after the start of treatment (NS). Only 13% in both groups thought they were less infectious, the correct answer.

More men than women had sexual contacts outside their relationship before they were aware of their status ($p < 0.05$). For the men we noted a tendency towards a decrease of these

TABLE I. SEXUAL CONTACTS OUTSIDE RELATIONSHIP

Sexual contacts outside relationship	Before diagnosis		After diagnosis but before treatment		After start of treatment	
	Men	Women	Men	Women	Men	Women
N	32	82	33	79	33	78
Frequency	48%	17%	21%	16%	11%	13%
95% CI	31 - 65%	11 - 25%	7 - 35%	8 - 24%	0 - 22%	6 - 20%

TABLE II. USE OF CONDOMS IN REGULAR RELATIONSHIP

Use of condoms in regular relationship	Before HIV diagnosis		After diagnosis but before start of treatment		After start of treatment	
	Men	Women	Men	Women	Men	Women
N	37	83	37	80	37	80
Frequency	25%	29%	38%	57%	72%	75%
95% CI	11 - 39%	19 - 39%	22 - 54%	46 - 68%	58 - 86%	66 - 84%

TABLE III. USE OF CONDOMS WITH CASUAL PARTNER

Use of condoms with casual partner	Before HIV diagnosis		After diagnosis but before start of treatment		After start of treatment	
	Men	Women	Men	Women	Men	Women
N	37	82	37	78	36	79
Frequency	53%	46%	66%	69%	87%	81%
95% CI	37 - 69%	34 - 58%	51 - 81%	59 - 79%	76 - 98%	72 - 90%

contacts after diagnosis being significant ($p < 0.05$) after the start of ART. The number of women who had sex outside their relationship remained constant during the three periods (Table I).

Use of condoms during sexual contact, both with regular partners and casual partners, increased significantly during ART compared with before HIV diagnosis ($p < 0.05$) (Tables II and III).

As many as 45% of the women said that they had never had sex with a men who used a condom, and 25% of the men that they had never used a condom.

DISCUSSION

We noted a tendency towards women having been aware of their HIV infection for a longer time than men. This may be explained by the belief that women are generally more concerned about their health than men. Many women also find out that they are HIV positive when they are pregnant; this often results in their finding out their status before they become symptomatic. Another possible explanation is that the peak of the epidemic differs for men and women.

Only 64% of the men and 51% of the women had disclosed their HIV status to their partner. Causes for the low disclosure rate might be stigma and fear of being abandoned, or that they no longer have contact with a former partner. There seemed to be no significant difference in levels of disclosure after the start of treatment, which is in agreement with recent studies from Johannesburg and Swaziland.[2,3]

SEXUAL BEHAVIOUR

One of the most surprising findings in this study was that so many of the participants (50% of the men and 40% of the women) thought that they were more infectious after starting their treatment. Only a few thought that they were less infectious, which is the correct scientific response. One explanation may be that the patients were informed that it is even more important, now that they are on treatment, to use condoms to prevent exchange of resistant strains.

More men than women had sexual contacts outside their relationship before their diagnosis. The number of men who stated they had sex outside their relationship decreased as their treatment progressed. We did not see this pattern among women.

For both sexes use of condoms increased after the start of treatment compared with before diagnosis of HIV. This contrasts with the findings from a study of sexual risk behaviour in HIV-positive injection drug users in Baltimore, USA, which demonstrated a threefold increase in unprotected sexual intercourse after HAART initiation.[4] The outcome of our study is similar to the findings in a meta-analytic review.[5]

A study of sexual risk behaviour based on a simple questionnaire has several shortcomings. It is based on self-reported behaviour which can not be confirmed by objective data. However, our results do not support the suggested increase of risk behaviour in connection with ART.

REFERENCES

1. Colton T. *Statistics in Medicine*. Boston: Little, Brown and Company, 1974: 153-158.
2. Skogmar S, Shakely D, Lans M, *et al.* Disclosure of HIV-serostatus in Johannesburg, South Africa. *AIDS Care Journal* 2006; **18**(7): 725-730.
3. Borgsund C, Sturesson A. Decreased sexual risk behaviour after testing HIV positive and no increase after start of antiretroviral treatment. Diploma thesis, Sahlgrenska Academy at Göteborg University, 2005.
4. Tun W, Gange SJ, Vlahov D, Strathdee SA, Celentano DD. Increase in sexual risk behaviour associated with immunologic response to highly active antiretroviral therapy among HIV-infected injecting drug *Clin Infect Dis* 2004; **38:** 1167-1174.
5. Crepaz N, Hart TA, Marks G. Highly active antiretroviral therapy and sexual risk behaviour. A meta-analytic review. *JAMA* 2004; **292:** 224-236.

Acknowledgements

We would like to thank Doctor Dennis Rubel, who helped with amendments and corrections to the questionnaire, the protocol and the patient information sheet for the application to the Human Research Ethical Committee. We are also grateful to the staff at the HIV clinic, especially those working in the pharmacy, for their help in finding patients who fulfilled our criteria. Finally we would like to thank Marlene Naidoo and Ina de Jongh at the HIV research unit and Dawn Francis at the University of Witswatersrand Medical School, who helped us solve all sorts of problems.