

# High risk behaviour and fertility desires among heterosexual HIV-positive patients with a serodiscordant partner – two challenging issues

Laura Panozzo<sup>a</sup>, Manuel Battegay<sup>b</sup>, Andree Friedl<sup>c</sup>, Pietro L. Vernazza<sup>a</sup>, and the Swiss HIV Cohort Study

Divisions of Infectious Diseases,

<sup>a</sup> Cantonal Hospital St. Gallen, Switzerland

<sup>b</sup> University Hospital Basel, Switzerland

<sup>c</sup> University Hospital Zürich, Switzerland

## Summary

*Aim of the study:* To evaluate fertility intentions and condom use among HIV-positive persons.

*Methods:* Multicentre study based on anonymous data collection (questionnaire).

*Results:* 114 questionnaires providing complete information were evaluated. 45% of HIV-positive women and 38% of HIV-positive men expressed the desire for children. Irrespective of this wish, half the study participants felt that health care providers would not sufficiently address their concerns regarding relationship, sexuality and fertility intentions. In HIV-discordant heterosexual couples, consistent condom use was mentioned by 73% of respondents. Among study participants no significant relationship between HAART, viral

load and inconsistent condom use was found. In contrast, information on condom use obtained from the Swiss HIV Cohort Study (SHCS), where the information is obtained by interview, gave higher estimates (88%) of consistent condom use.

*Conclusions:* A significant proportion of HIV-infected individuals express a wish for parenthood. Issues related to fertility intentions and sexual relations need to be addressed more frequently by health care providers. Non-anonymous data collection on condom use may underestimate high risk behaviour.

*Key words:* HIV infection; fertility desire; serodiscordant partner; condom use

## Introduction

Since the introduction of highly active anti-retroviral therapy (HAART) in 1996, the ways in which infected individuals confront the disease have changed considerably. HIV-related morbidity and mortality have declined markedly in industrialised countries [1–4]. The number of AIDS-related deaths in Switzerland has decreased constantly since 1995 [5]. Furthermore, a significant reduction in vertical transmission from infected

mothers to their children has been achieved [6–10]. With the introduction of more effective therapies and an improved prognosis, a change in the perception of family planning must be assumed. This study was designed to investigate the fertility desires of HIV-positive heterosexuals and evaluate the manner in which they deal with issues relating to partnership and sexuality.

## Methods

An anonymous questionnaire was prepared in September 1999. It contained questions on demographic aspects (sex, age, living circumstances, number of children), relationship status and sexual behaviour (risk group, frequency of sexual intercourse and condom use, reasons for

inconsistent condom use). Participants were also asked whether their health care providers addressed themes such as relationship and sexuality. The questionnaire was tested over a six-month period at the Clinic of Infectious Diseases in St. Gallen, and a new version was drawn up there-

after. Results from the pilot phase are not included in this analysis.

Risk group and reasons for inconsistent condom use were no longer considered in the new questionnaire. Questions on health status and laboratory values (CD4<sup>+</sup> count, viral load, changes in laboratory values) and the desire for children were included.

From October 2000 until June 2001 health care providers at the Clinics of Infectious Diseases in St. Gallen and Basel distributed the questionnaires with a prepaid envelope to HIV-positive patients. At the Zürich Infectious Diseases Clinic questionnaires were made available in the waiting area. Participants returned the questionnaire to the centre in St. Gallen by regular mail (prepaid).

The analysis was confined to respondents who reported heterosexual intercourse only and answered the questions on desire for children. Regular condom use was considered if people answered questions related to it with

“always”. Those who replied to these questions with “sometimes”, “rarely” or “never” were regarded as inconsistent condom users.

The study population was compared with a sample from the SHCS with regard to demographic characteristics (sex, age, duration of HIV infection, receiving HAART, current CD4<sup>+</sup> count, viral load) and condom use (with serodiscordant partner, related to HAART and viral load). From the SHCS all heterosexuals living in a serodiscordant partnership who had a follow-up visit between September 2000 and December 2001 were considered.

### Statistical analysis

Proportions were compared with chi-square test and Fischer's exact test as appropriate, and +test for trends was used where indicated.

## Results

The three centres distributed 401 questionnaires (Cantonal Hospital St. Gallen 163, University Hospitals of Basel and Zurich 66 and 172 respectively). 130 completed questionnaires were returned, yielding a response rate of 32%. 16 males who reported sexual intercourse with males were

excluded. Six women aged over 40 were not included in the evaluation with regard to desire for children. 114 HIV-positive heterosexuals provided complete information.

The sociodemographic characteristics of the study population are listed in table 1. When compared with the heterosexual population from the SHCS, patients from the SHCS showed a longer duration of HIV infection and better values for

**Table 1**  
Sociodemographic characteristics (n = 114) (%).

Sex	men	68 (40)
	women	46 (60)
Age (years)	20-30	19 (17)
	31-40	61 (54)
	41-50	24 (21)
	>50	10 (8)
Duration of HIV infection (years) ≤5	33 (29)	
	6-10	31 (27)
	>10	50 (44)
Receiving HAART	yes	91 (80)
	no	23 (20)
Change in CD4 <sup>+</sup> count	increased	61 (54)
	unchanged	10 (9)
	decreased	15 (13)
	do not know	28 (24)
Current CD4 <sup>+</sup> count	<200/mm <sup>3</sup>	19 (17)
	200-499/mm <sup>3</sup>	44 (39)
	>500/mm <sup>3</sup>	26 (23)
	do not know	25 (21)
Viral load	<1000 cop./ml	57 (50)
	>1000 cop./ml	18 (16)
	do not know	39 (34)
Steady partnership	yes	58 (51)*
	no	56 (49)
Number of children	0	86 (75)
	1	18 (16)
	2	6 (5)
	≥3	4 (4)

\* 43 persons (74%) had a relationship with an HIV-negative primary partner

**Table 2**

Comparison between study and SHCS population – sociodemographic characteristics.

	Study population	SHCS population	p
Sex			
Men	46 (40%)	618 (36%)	0.36
Women	68 (60%)	1093 (64%)	
Age (years)			
20-30	19 (17%)	178 (10%)	0.06
31-40	61 (54%)	848 (50%)	
41-50	24 (21%)	514 (30%)	
>50	10 (9%)	171 (10%)	
Duration of HIV infection (years)			
<5	33 (29%)	292 (17%)	0.004
6-10	31 (27%)	466 (27%)	
>10	50 (44%)	953 (56%)	
HAART			
Yes	91 (80%)	1275 (75%)	0.21
No	23 (20%)	436 (25%)	
Current CD4 <sup>+</sup> count			
<199	19 (21%)	198 (12%)	0.005
200-499	44 (49%)	790 (46%)	
>500	26 (29%)	723 (42%)	
Viral load			
<1000	57 (76%)	1186 (69%)	0.22
>1000	18 (24%)	525 (31%)	

CD4<sup>+</sup> cell counts than those from the study population (table 2).

*Desire for children:* 20% of HIV-positive women aged between 20 and 40 and 22% of HIV-positive men aged between 20 and 50 reported a current desire for children during the study period. An even larger proportion stated they would like to have children in the future (47.5% of HIV-positive women and 38% of HIV-positive men). Duration of HIV-infection and current antiretroviral therapy had no significant influence on desire for children (*duration of HIV infection <10 years vs. >10 years, 47% vs. 36%, p = 0.24; HAART Yes vs. No, 45% vs. 32%, p = 0.28*). Desire for children decreased in both male and female participants aged over 40 (*p = 0.03*).

Individuals who experienced improved health while on HAART were significantly more likely to express a desire for parenthood, while CD4<sup>+</sup> count and viral load had no effect on the desire for children (table 3).

*Condom use:* With regard to condom use the SHCS data differ significantly from those obtained in this anonymous survey (*condom use SHCS 88% vs. this study 73%; p = 0.02*). In the SHCS survey, individuals with a steady HIV-negative partner (*n = 1711*) and with a viral load **above** 1000 cop./ml were less likely to use condoms consistently (*84% vs 89% in <1000 cop./ml group, p = 0.002*). SHCS patients on HAART were also more consistent condom users than patients without treatment (*89% vs 84% respectively, p = 0.007*).

Among HIV-discordant partnerships, inconsistent condom use was independent of the current desire to conceive (22% in 18 individuals with strong vs. 32% in those with deferred or no fertility desire). Irrespective of the desire for children, 47% of all study participants felt that health care providers would not sufficiently address personal issues such as relationship, sexuality and desire for children.

**Table 3**

Distribution of study participants (receiving HAART) and their desire for children, by selected characteristics (*n = 91*).

Characteristic	desire children/ deferred desire	do not desire children	p
Overall health status on HAART			
Better	37 (90%)	34 (70%)	0.01
Not better	4 (10%)	16 (30%)	
Viral load			
<1000 cop./ml	25 (61%)	30 (60%)	0.92
>1000 cop./ml	16 (39%)	20 (40%)	
Change in CD4 <sup>+</sup> count ( <i>n = 82</i> )			
Increased or same	32 (86%)	37 (82%)	0.59
Decreased	5 (14%)	8 (18%)	

## Discussion

To the best of our knowledge this is the first study to examine fertility issues among HIV-positive women and men in a Swiss population. It shows that many HIV-positive people consider the possibility of parenthood. Despite the fact that 25% of respondents already have at least one child (table 1), 20% of HIV-positive women aged 20–40 and 22% of HIV-positive men aged 20–50 reported a desire to have children during the study period. If those who currently deferred this desire are also considered, the proportion is 48% of HIV-positive women and 38% of HIV-positive men. These figures are very similar to those in HIV-negative individuals. In a Swiss population-based survey 49% of women aged 20–40 and 39% of men aged 20–50 said they would consider having a child in the future [11]. Given the low response rate in this survey, a selection bias cannot be ruled out. However, comparison of patient characteristics in this study and the highly representative SHCS did not reveal a strong selection bias. It cannot of course be ruled out that participants with a wish for parenthood responded more frequently than others.

Further, a subjectively good health status seemed to be of greater value to HIV-positive people weighing reproductive decisions than objective parameters such as CD4<sup>+</sup> cell count or viral load. Neither a decrease in CD4<sup>+</sup> count nor high viral load values had a significant influence on the desire for children. Women in subjectively good health in particular expressed a desire to have children more often than men (data not shown). It appears that women tend more to consider pregnancy if they feel well, regardless of an uncertain prognosis based on laboratory findings [12–16]. A recently published study involving a US population shows similar results [17]. Overall, women in our study had better laboratory parameters than those in the comparative study. The risk of vertical transmission remains in spite of intensive therapeutic measures [18]. The risk of antiretroviral combination therapies for the offspring remains [19, 20] and needs to be taken into consideration when counselling women with fertility intentions.

Among study participants with a serodiscordant partner, 73% reported consistent condom use. This result is considerably lower than in the

SHCS, where the rate of consistent condom users was 88%, most probably a reflection of differences in data collection methods. However, selection bias cannot be ruled out.

In an African study, Quinn et al. found that the risk of heterosexual transmission is almost non-existent with serum HIV-1 RNA levels <1500 cop./ml, and consequently worsens with increasing viral load [21]. In the SHCS data set absence of antiretroviral therapy and high viral load were associated with inconsistent condom use. At first sight this result seems paradoxical. It might be assumed that compliance with safer sex and HAART recommendations are associated. A detailed analysis of this association has recently been conducted (Bucher et al., submitted).

Irrespective of fertility desire, 47% of all participants felt that health care providers would not sufficiently address issues such as relationship, sexuality and desire for children. These important issues greatly complicate the task of caring for HIV-positive people, and may influence decisions regarding HAART.

In summary, the results of this small survey should encourage physicians to discuss fertility

issues more frequently with their HIV-infected patients, and underscore the importance of continued intervention with regard to risk behaviour in HIV-discordant couples.

The members of the Swiss HIV Cohort Study are M. Battegay, E. Bernasconi, H. Bucher, Ph. Bürgisser, M. Egger, P. Erb, W. Fierz, M. Fischer, M. Flepp (Chairman of the Clinical and Laboratory Committee), P. Francioli (President of the SHCS, Centre Hospitalier Universitaire Vaudois, CH-1011 Lausanne), H.J. Furrer, M. Gorgievski, H. Günthard, P. Grob, B. Hirschel, L. Kaiser, C. Kind, Th. Klimkait, B. Ledergerber, U. Lauper, M. Opravil, F. Paccaud, G. Pantaleo, L. Perrin, J.-C. Piffaretti, M. Rickenbach (Head of Data Centre), C. Rudin (Chairman of the Mother & Child Substudy), J. Schupbach, R. Speck, A. Telenti, A. Trkola, P. Vernazza (Chairman of the Scientific Board), Th. Wagners, R. Weber, S. Yerly.

---

*Correspondence:*

*Pietro Vernazza*

*Division of Infectious Diseases*

*Cantonal Hospital St. Gallen*

*CH-9007 St. Gallen*

*E-Mail: Pietro.Vernazza@kssg.ch*

---

## References

- 1 Palella FJ Jr, Delaney KM, Moorman AC, Loveless MO, Fuhrer J, Satten GA, et al. Declining morbidity and mortality among patients with advanced human immunodeficiency virus infection. *N Engl J Med* 1998;338:853-60.
- 2 Girardi E, Palmieri E, et al. Changing clinical presentation and survival in HIV-associated tuberculosis after highly active antiretroviral therapy. *J Acquir Immune Defic Syndr* 2001;26(4):326-31.
- 3 Egger M, Hirschel B, Francioli P, et al. Impact of new antiretroviral combination therapies in HIV infected patients in Switzerland: prospective multicentre study. *BMJ* 1997;315:1194-9.
- 4 Dore GJ, Yueming Li, McDonald A, Ree H, Kaldo JM for The National HIV Surveillance Committee. Impact of highly active antiretroviral therapy on individual AIDS-defining illness incidence and survival in Australia. *JAIDS* 2002;29:388-95.
- 5 Bundesamt für Gesundheit. Aids und HIV in der Schweiz. Epidemiologische Situation Ende 2000.
- 6 Connor EM, Sperling R, Gelber R, et al. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with Zidovudine treatment. *N Engl J Med* 1994;331:1173-80.
- 7 European Collaborative Study. HIV-infected pregnant women and vertical transmission in Europe since 1986. *AIDS* 2001;15:761-70.
- 8 The International Perinatal HIV Group. The mode of delivery and the risk of vertical transmission of human immunodeficiency virus type 1. *N Engl J Med* 1999;340:977-87.
- 9 Kind C, Rudin C, Siegrist CA, et al. Prevention of vertical HIV transmission: additive protective effect of elective cesarean section and zidovudine prophylaxis. *AIDS* 1998;12:205-10.
- 10 Simonds RJ, Steketee R, Nesheim S, et al. Impact of zidovudine use on risk and risk factors for perinatal transmission of HIV. *AIDS* 1998;12:301-8.
- 11 Bundesamt für Statistik. Kinderwunsch: eine Analyse der Ergebnisse des Mikrozensus Familie in der Schweiz. Demos, Informationen aus der Demographie 1/99.
- 12 Mellors JW, Munoz A, Giorgi JV. Plasma viral load and CD4+ lymphocytes as prognostic markers of HIV-1 infection. *Ann Intern Med* 1997;126:946-54.
- 13 O'Brien WA, Hartigan PM, Daar ES, Simberloff MS, Hamilton JD, for The VA Cooperative Study Group on AIDS. Changes in plasma HIV RNA levels and CD4+ lymphocyte counts predict both response to antiretroviral therapy and therapeutic failure. *Ann Intern Med* 1997;126:939-45.
- 14 Kitchen CM, Kitchen SG, et al. Initial virological and immunologic response to highly active antiretroviral therapy predicts long-term clinical outcome. *Clin Infect Dis* 2001;33:466-72.
- 15 Miller V, Sabin CA, Phillips AN, et al. The impact of protease inhibitor-containing highly active antiretroviral therapy on progression of HIV disease and its relationship to CD4 and viral load. *AIDS* 2000;14:2129-36.
- 16 Sterling TR, et al. Initial plasma HIV-1 levels and progression to AIDS in women and men. *N Engl J Med* 2001;344:720-5.
- 17 Chen JL, Phillips KA, et al. Fertility desires and intentions of HIV-positive men and women. *Family Planning Perspectives* 2001;33:144-52.
- 18 The European Collaborative Study. Maternal viral load and vertical transmission of HIV-1: an important factor but not the only one. *AIDS* 1999;13:1377-85.
- 19 Blanche S, Tardieu M, Rustin P, et al. Persistent mitochondrial dysfunction and perinatal exposure to antiretroviral nucleoside analogues. *The Lancet* 1999;354:1084-9.
- 20 Lorenzi P, Spicher VM, Laubeau B, et al. Antiretroviral therapies in pregnancy: maternal, fetal and neonatal effects. *AIDS* 1998;12:241-7.
- 21 Quinn TC, et al. Viral load and heterosexual transmission of human immunodeficiency virus type 1. *N Engl J Med* 2000;342:921-9.

## The many reasons why you should choose SMW to publish your research

### What Swiss Medical Weekly has to offer:

- SMW's impact factor has been steadily rising, to the current 1.537
- Open access to the publication via the Internet, therefore wide audience and impact
- Rapid listing in Medline
- LinkOut-button from PubMed with link to the full text website <http://www.smw.ch> (direct link from each SMW record in PubMed)
- No-nonsense submission – you submit a single copy of your manuscript by e-mail attachment
- Peer review based on a broad spectrum of international academic referees
- Assistance of our professional statistician for every article with statistical analyses
- Fast peer review, by e-mail exchange with the referees
- Prompt decisions based on weekly conferences of the Editorial Board
- Prompt notification on the status of your manuscript by e-mail
- Professional English copy editing
- No page charges and attractive colour offprints at no extra cost

### Editorial Board

Prof. Jean-Michel Dayer, Geneva  
 Prof. Peter Gehr, Berne  
 Prof. André P. Perruchoud, Basel  
 Prof. Andreas Schaffner, Zurich  
 (Editor in chief)  
 Prof. Werner Straub, Berne  
 Prof. Ludwig von Segesser, Lausanne

### International Advisory Committee

Prof. K. E. Juhani Airaksinen, Turku, Finland  
 Prof. Anthony Bayes de Luna, Barcelona, Spain  
 Prof. Hubert E. Blum, Freiburg, Germany  
 Prof. Walter E. Haefeli, Heidelberg, Germany  
 Prof. Nino Kuenzli, Los Angeles, USA  
 Prof. René Lutter, Amsterdam, The Netherlands  
 Prof. Claude Martin, Marseille, France  
 Prof. Josef Patsch, Innsbruck, Austria  
 Prof. Luigi Tavazzi, Pavia, Italy

We evaluate manuscripts of broad clinical interest from all specialities, including experimental medicine and clinical investigation.

We look forward to receiving your paper!

Guidelines for authors:

[http://www.smw.ch/set\\_authors.html](http://www.smw.ch/set_authors.html)

### Impact factor Swiss Medical Weekly



All manuscripts should be sent in electronic form, to:

EMH Swiss Medical Publishers Ltd.  
 SMW Editorial Secretariat  
 Farnsburgerstrasse 8  
 CH-4132 Muttenz

Manuscripts: [submission@smw.ch](mailto:submission@smw.ch)  
 Letters to the editor: [letters@smw.ch](mailto:letters@smw.ch)  
 Editorial Board: [red@smw.ch](mailto:red@smw.ch)  
 Internet: <http://www.smw.ch>