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Female to Male: An Inefficient Mode of Transmission of Human Immunodeficiency Virus (HIV)

To the Editor: Although acquired immune deficiency syndrome (AIDS) was first seen among homosexuals (1), heterosexual transmission of the syndrome is probably now the leading route of HIV infection worldwide (2,3). However, whether heterosexual transmission of HIV infection is more efficient from men to women or from women to men is still controversial. Here we report on five women with HIV infection (four of them contracted the infection through blood transfusion) and on their children, who also were diagnosed as having AIDS or AIDS-related complex (ARC), and a follow-up on their husbands. The patients were seen, diagnosed, and followed at King Khalid University Hospital in Riyadh during the past two years (1987–1988). A summary of the clinical status, HIV markers, and diagnosis of the five cases and their family members including their husbands is shown in Table 1. In the four cases where the wife contracted HIV infection through blood transfusion, all of the husbands were healthy and negative for all markers of HIV. Perinatal transmission of HIV infection took place in cases 1, 2, and 5. In case 3, all five children, who were born before the mother had the blood transfusion, were healthy and negative for HIV markers. In case 5, there was no relevant history to suggest contracting HIV infection except from the husband, who was a recipient of factor VIII concentrate due to his bleeding disorder (hemophilia type B).

Transmission of HIV infection from males to females is well accepted whereas the frequency of transmission from females to males remains controversial. Although female to male transmission of HIV infection is well documented in Africa (4), such a mode of transmission has been reported infrequently in the United States. One explanation for this observation is that, in the United States, female to male transmission is less efficient or that this transmission is not yet well recognized among Americans due to the relatively lesser number of infected women compared to men. Although more cases have to be investigated, our data are in favor of the former explanation. Further support to the more efficient transmission of HIV infection from male to female is provided by the isolation of HIV from semen (5) and also by transmission of HIV infection through artificial insemination by semen alone (6). HIV was isolated from the vagina (7,8) but HIV transmission by vaginal fluid has not yet been proved. Burke and Redfield (9) suggest that the capacity of HIV-infected persons to transmit infection venereally to others increases with the duration of infection since more antigens could be detected in the late stages of infection. Although this might be true, none of the husbands of the two AIDS female cases had evidence of HIV infection even after 4–5 years of sexual exposure. The husbands are still being followed for evidence of HIV infection. Although the number of our cases is small; we still can agree with Handsfield (10) that, at least at present, sustained heterosexual transmission of HIV seems to be limited by the relatively inefficient female to male spread. The inefficient transmission of HIV infection from the infected wives to their husbands was in sharp contrast to the transmission of infection to their offspring. This is in keeping with recent evidence that perinatal (intrauterine or peripartum) transmission is a major route of transmission of HIV infection from infected mothers to their offspring (11,12).

Finally, it must be mentioned that AIDS in African men has been associated with the frequency of sex with female prostitutes (4). Based on our data, it is perhaps reassuring that regular sexual partners of HIV-infected females remain uninfected.

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TABLE 1. *Summary of relevant history, clinical status and HIV markers for HIV-positive cases and their family members*

Wife[a]		Children[a]		Husband	
Relevant history	Clinical status	Age	Clinical status	Clinical status	HIV Markers[b]
1. Blood transfusion	ARC	1. 3 year	ARC	Healthy	Negative
		2. 6 months	ARC		
2. Blood transfusion	ARC	10 months	AIDS (died)	Healthy	Negative
3. Blood transfusion	AIDS (died)	All five children were over 5 years of age and were healthy and negative for HIV markers[b]		Healthy	Negative
4. Blood transfusion	AIDS (died)	—	—	Healthy	Negative
5. Husband had hemophilia B	ARC	1 year	AIDS (died)	ARC (Hemophilia B)	Anti-P24 (+) Anti-gP41 (+) HIV-Ag (−)

[a] All patients were anti-P24 and anti-gP41-positive.
[b] HIV markers: anti-HIV core (anti-P24); anti-HIV env (anti-gP24); HIV-Ag.

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