
Heterosexual and Mother-to-Child Transmission of AIDS in the Hemophilia Community

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Synopsis

Growing awareness of the potential modes of transmission of the human immunodeficiency virus (HIV) has encouraged interest in the epidemiology of infection among sexual partners and children of HIV-infected persons. The authors reviewed data on two groups, the first being those with HIV infection acquired heterosexually from a person whose hemophilia, or other chronic bleeding disorder, was treated with blood products. The second group was children with HIV infection acquired from a mother (vertical transmission) who either

had been treated for a chronic bleeding disorder or had been the heterosexual partner of a person being treated. Surveillance data were examined for cases of acquired immunodeficiency syndrome (AIDS) in the United States reported to the Centers for Disease Control and Prevention, diagnosed before January 1, 1992, and for whom the only identified risk factor was being either the heterosexual partner or the child of a parent with a chronic bleeding disorder.

Of the cases examined, 107 were in persons who were heterosexual partners of persons with chronic bleeding disorders. Of the 107, 98 (92 percent) were women and 87 (81 percent) were white; all were 17 years of age or older. In addition to the 107, there were 14 children, 10 (71 percent) of whom were diagnosed with AIDS in the first year of life. The rate of increase in such cases has not been as great in recent years as that observed early in the primary epidemic of AIDS among persons with hemophilia and other chronic bleeding disorders.

These data underscore the risk of HIV transmission among heterosexually active couples, if one partner is seropositive, and the risk of transmission to offspring. Estimates of the prevalence of HIV infection among heterosexual women partners of HIV-infected men with hemophilia are comparable to estimates for women who had heterosexual contact with spouses infected with HIV from transfusions with cellular products. However, better data for estimates of persons at risk are needed to obtain more accurate comparisons.

WORLDWIDE, most cases of human immunodeficiency virus (HIV) infection have been acquired through heterosexual activity. In the United States, most cases of infection have occurred among homosexual and bisexual men and among intravenous drug users (1), with heterosexual transmission occurring primarily from men to women (2, 3).

In 1983, the wife of an elderly man with hemophilia was reported as having acquired immunodeficiency syndrome (AIDS). The report reflected the potential for heterosexual transmission of HIV within couples if a partner with a chronic bleeding

disorder had been treated with infected blood products (4). In 1984, 3 of 30 (10 percent) persons tested who were sexual partners of persons with hemophilia were found to be HIV seropositive, presumably acquired through exposure by heterosexual contact (5, 6). By September 1988, at least 25 women who were sexual partners of hemophilic men and 1 man who was the sexual partner of a woman with an acquired coagulopathy had developed AIDS (7).

Vertical transmission of HIV occurs transplacentally during pregnancy and probably during labor

'...studies from hemophilia treatment centers suggest that HIV infection has occurred in 33 to 92 percent of treated persons with hemophilia A and 14 to 60 percent of treated persons with hemophilia B.'

and delivery as a result of contact with contaminated blood and body fluids (8). In several case reports, breast milk also has been implicated strongly as the vehicle of HIV transmission (9-12). Epidemiologic evidence has linked breast feeding to higher rates of infant seropositivity (13). In one study, at least 39 percent of children born to HIV-seropositive mothers were infected with HIV (14). By September 1988, at least six children who were born to women sexual partners of hemophilic men had developed AIDS (7).

AIDS has become the leading cause of death for women of childbearing age in major cities in the Americas, Western Europe, and sub-Saharan Africa (15). AIDS is now estimated to be among the top five causes of death among children 1 to 4 years of age in this country (16).

As awareness of the potential modes of HIV transmission has grown, the emerging secondary epidemic among sexual partners and children of HIV-infected persons with hemophilia or other chronic bleeding disorders is receiving increased attention (17). We used national demographic and diagnostic AIDS surveillance data in reexamining the epidemiology of AIDS among persons whose only risk factor for infection was having heterosexual contact with a person with a chronic bleeding disorder or having a parent with a chronic bleeding disorder.

Surveillance Data Review Methods

Surveillance of AIDS is maintained through standardized AIDS case reporting, which is required in all States and territories, with State health departments reporting to the Centers for Disease Control and Prevention (CDC) (18, 19). Data were examined for persons with AIDS whose only identified risk factor for HIV infection was being either a heterosexual partner or a child whose father or mother had hemophilia or another chronic bleeding disorder, who were diagnosed with AIDS before January 1, 1992, and whose case was reported to

CDC by April 30, 1992. The parent or partner with the bleeding disorder had to have received blood or blood components since 1978 as treatment for a congenital or acquired chronic dysfunction of the coagulation system.

There were 69 persons diagnosed with AIDS before January 1, 1992, who were heterosexual partners of persons with hemophilia, but who had other risk factors for acquiring HIV infection. They were excluded from the study. They included 22 persons who had reported engaging in homosexual or bisexual activity, 18 with histories of intravenous drug use, 12 with histories of both homosexual or bisexual activity and intravenous drug use, 7 with heterosexual contact with an intravenous drug user, 6 who had hemophilia or another chronic bleeding disorder, 3 who had received blood or blood product transfusions since 1977, and 1 who reported heterosexual contact with a bisexual man.

Seven persons diagnosed with AIDS before January 1, 1992, who were children of persons with hemophilia and who had other risk factors for acquiring HIV infection, were excluded because of lack of knowledge as to which exposure was the source of their HIV infection. They included four persons whose mothers had histories of intravenous drug use, two who had received blood or blood product transfusions since 1977, and one whose mother reported heterosexual activity with an intravenous drug user.

Data were analyzed by sex, age, race or ethnicity, date of diagnosis with AIDS, and AIDS-indicator diseases. The date of the AIDS diagnosis was defined as the date that the first AIDS-indicator disease was diagnosed, such as an opportunistic infection or a neoplasm meeting the CDC's AIDS case definition (19).

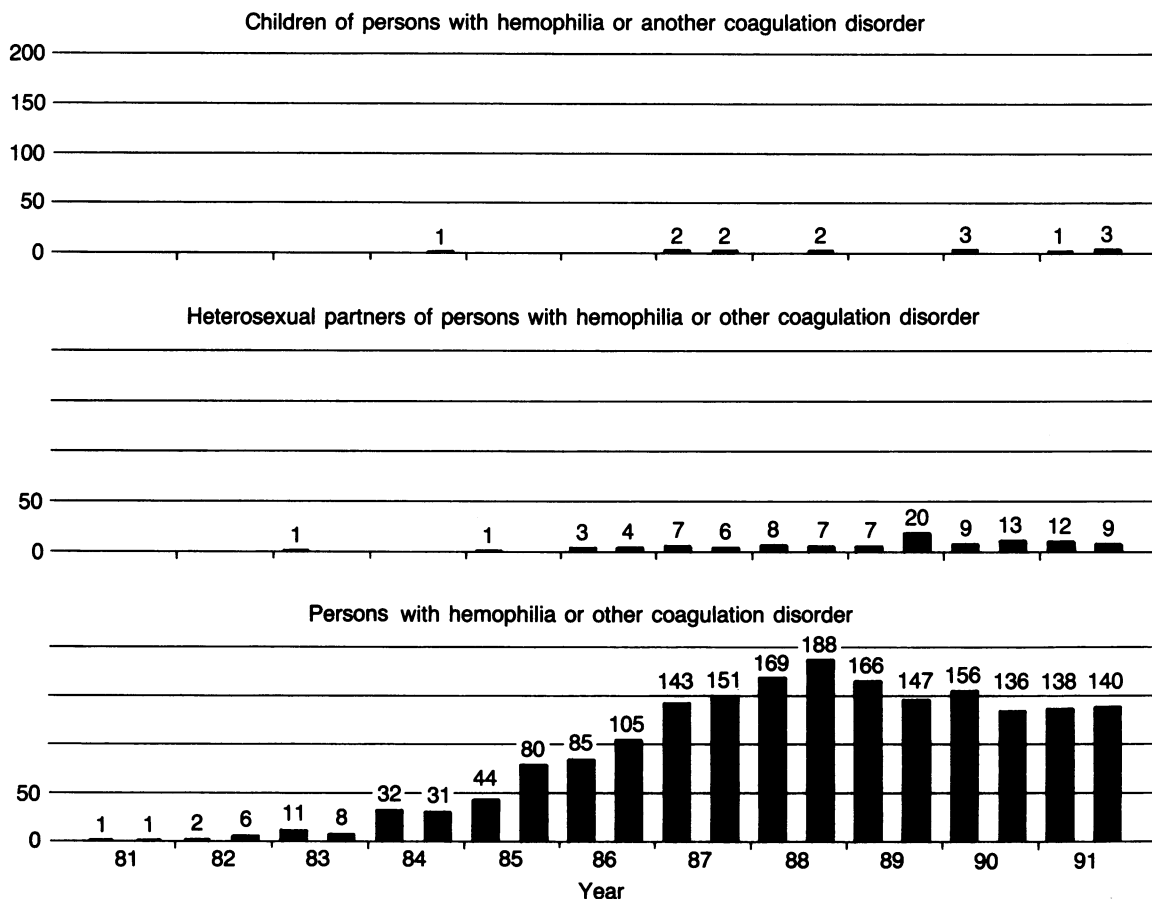
Results of Surveillance Data Review

From January 1, 1981, through April 30, 1992, 107 cases of AIDS were reported to CDC in persons whose diagnosis of AIDS was made before January 1, 1992, and whose only identified risk factor for HIV infection was being a heterosexual partner of a person with hemophilia or another chronic bleeding disorder. The first case was diagnosed in early 1983, about 2 years after the first case of hemophilia-associated AIDS (see chart).

The distribution of the 107 cases by time of diagnosis at half-year intervals initially resembled the distribution of reported AIDS cases from the earliest years of the AIDS epidemic among persons with hemophilia or another chronic bleeding disorder.

AIDS cases among persons whose only identified risk factor for HIV infection was being (a) a child of a person with hemophilia or other chronic bleeding disorder, (b) a heterosexual partner of a person with hemophilia or other chronic bleeding disorder, or (c) a person with hemophilia or other chronic bleeding disorder who received blood or blood components since 1978, by 6-month period of diagnosis, 1981–91, reported as of April 30, 1992, in the United States

Number of AIDS case diagnosed



der and with no other identified risk factors for acquiring HIV infection (see chart); however, subsequent increases in numbers of cases have been minimal. Of the 107 case patients, 98 (92 percent) were female, 87 (81 percent) were white, 13 (12 percent) were black, 5 were Hispanic, and 2 were Asian. All were 17 years of age or older, ranging from 17 to 76 years. The average age was in the childbearing years, with a mean of 36 years and a median of 31 years.

The proportions of AIDS-indicator diseases observed among heterosexual partners of persons with hemophilia were similar to those reported for other heterosexually HIV-infected populations (20). The most common AIDS-indicator disease was *Pneumocystis carinii* pneumonia (PCP) (56 percent), with a wide spectrum of other AIDS-indicator diseases observed, each with a few cases (0.9 to 17.8 percent) (table 1). Kaposi sarcoma (KS), an

uncommon finding among heterosexually infected persons with AIDS (21), was reported as an AIDS-indicator disease in only one of 107 patients in this study.

Fourteen cases of AIDS among children were reported to CDC from January 1, 1981, through April 30, 1992, whose diagnosis of AIDS was made before January 1, 1992, and whose only identified risk factor for HIV infection was having a parent with hemophilia or another chronic bleeding disorder. The first case was diagnosed in late 1984 (see figure). Of the 14 children, 11 were male, 9 were white, 3 were black, and 2 were Hispanic. Ten were diagnosed with AIDS in the first year of life, two at age 1 year, and two at age 2 years. This is consistent with observations in other populations of vertically HIV-infected children, in which the majority of those who manifest signs and symptoms of HIV infection do so in the first year of life (13,

Table 1. Diagnoses indicative of AIDS among 107 persons whose only identified risk factor for HIV infection was being the heterosexual partner of a person with hemophilia or another chronic bleeding disorder

| Diagnosis | Number of cases | Percent |
|---|-----------------|---------|
| <i>Pneumocystis carinii</i> pneumonia | 60 | 56.1 |
| Candidiasis, esophageal | 19 | 17.8 |
| Cytomegalovirus infection, internal organ | 11 | 10.3 |
| HIV encephalopathy | 9 | 8.4 |
| HIV wasting syndrome | 9 | 8.4 |
| <i>Mycobacterium avium</i> complex, disseminated | 8 | 7.5 |
| Cytomegalovirus retinitis | 5 | 4.7 |
| Chronic mucocutaneous herpes simplex infection | 4 | 3.7 |
| Lymphoma (Burkitt's, immunoblastic, or primary of brain) | 4 | 3.7 |
| Toxoplasmosis of brain | 4 | 3.7 |
| Cryptococcosis, extrapulmonary | 3 | 2.8 |
| Chronic cryptosporidiosis | 3 | 2.8 |
| Atypical <i>mycobacterium</i> infection, disseminated or extrapulmonary | 3 | 2.8 |
| Coccidiomycosis, disseminated or extrapulmonary | 2 | 1.9 |
| <i>Mycobacterium tuberculosis</i> , disseminated or extrapulmonary | 2 | 1.9 |
| Candidiasis of bronchi, trachea, or lungs | 1 | 0.9 |
| Kaposi sarcoma | 1 | 0.9 |

Table 2. Diagnoses indicative of AIDS among 14 children whose only identified risk factor for HIV infection was having a parent with hemophilia or another chronic bleeding disorder

| Diagnosis | Number of cases | Percent |
|---|-----------------|---------|
| <i>Pneumocystis carinii</i> pneumonia | 9 | 64.3 |
| Bacterial infections, multiple or recurrent (including <i>Salmonella</i> septicemia) ¹ | 4 | 28.6 |
| HIV wasting syndrome | 2 | 14.3 |
| Lymphoid interstitial pneumonia or pulmonary lymphoid hyperplasia ¹ | 2 | 14.3 |
| Candidiasis, esophageal or of bronchi, trachea, or lungs | 1 | 7.1 |
| Cytomegalovirus retinitis | 1 | 7.1 |
| HIV encephalopathy | 1 | 7.1 |

¹ Included in CDC case definition for AIDS for persons younger than 13 years of age.

22-24). As in other HIV-infected populations, PCP was the most common AIDS-indicator disease (nine cases or 64 percent) at the time of initial diagnosis, with several other AIDS-indicator diseases, each of which was observed in four or fewer cases (table 2).

Discussion and Conclusions

The surveillance data describe the epidemiology of AIDS among heterosexual partners and children of persons with hemophilia or other chronic bleeding disorders. These data underscore the risk of transmission of HIV among heterosexually active couples. Among women in the United States, the second most common AIDS risk group had heterosexual contact with a person at risk for AIDS (25). Although mostly limited by small sample sizes, recent estimates of the prevalence of HIV seropositivity among heterosexual women partners of HIV-infected persons with hemophilia have ranged from 7 percent (26) to 21 percent (27), comparable to estimates for women who had heterosexual contact

with spouses infected with HIV from transfusion with cellular products (28).

In the largest study, a 1987 national telephone survey of physicians and hemophilia treatment centers, HIV-seropositivity was reported in 77 (10 percent) of 772 known spouses or sexual partners of HIV-seropositive hemophilic men (29). A 1990 survey at a treatment center in Germany of 178 heterosexual partners of HIV-seropositive persons with hemophilia yielded similar results. Nineteen (11 percent) partners were found to be HIV-seropositive (30). Other studies have indicated a continuing risk of HIV infection for spouses and other sexual partners of HIV-infected persons with hemophilia (26, 31-33) and a need for educational strategies and psychosocial support programs appropriate for the hemophilia community (34).

Accurate estimates of the number of heterosexual partners of HIV-infected persons with hemophilia in the United States do not exist. If AIDS-related mortality is discounted, present median life expectancy of persons with hemophilia, even among the

severely affected, is only slightly less than that of the general population (35). Hence, increases beyond historic levels in the prevalence of identified cases of hemophilia, owing to advances in diagnosis and therapy, have rendered meaningless the 1980 estimate of 14,467 as the total number of persons in the country with hemophilia (36). Consequently, estimates of the number of HIV-infected persons with hemophilia have lacked precision. Those estimates have been 8,000 (37), 10,000 (38), and 16,000 (39). By extension, those have been estimates as well of potential heterosexual partners at risk.

Studies from hemophilia treatment centers suggest that HIV infection has occurred in 33 to 92 percent of treated persons with hemophilia A and 14 to 60 percent of treated persons with hemophilia B (40-45). Hence, the number of potential heterosexual partners at risk for HIV infection in the hemophilia community is assumed to be high, as is the potential for vertical transmission of HIV through pregnancy (46, 47). However, continued heterosexual HIV transmission in the hemophilia community could be interrupted by the influences of HIV infection on sexual relationships, resulting in divorce, separation, death of the person with hemophilia, or cessation of sex (48).

Heterosexual transmission has been associated with the failure to use condoms and with the total number of sexual contacts with an infected partner that include ejaculation, oral-genital sex, and passive anal intercourse (49-51). However, the frequency of such transmission is erratic, with a biologic variation in transmissibility or susceptibility that is unexplained (28). HIV infectivity may be maximal at the temporal extremes, the earliest and the latest phases, of HIV infection (48, 52). Almost a decade has passed since the peak occurrence of initial HIV infection in the hemophilia community (1981-83). Most persons with hemophilia now are in one of three conditions. They are either in their asymptomatic period, or in the late stages of symptomatic disease when clinical illness often precludes sexual activity and potential transmission, or they are not infected with HIV. Hence, the numbers of new AIDS cases among sexual partners of persons with hemophilia may be expected to decrease (48). In addition, transmission of HIV from infected persons to household or family members has not been documented, except to those who potentially had shared intravenous needles, had sexual contact, or were exposed at conception, in utero, or in the perinatal period (6, 51-55).

The secondary epidemic in heterosexual partners

and offspring of persons with hemophilia has grown slower and affected fewer persons than the primary epidemic recognized 4 years earlier (56). A recent decline has been observed in the number of reported AIDS cases among heterosexual partners of persons with hemophilia. The decline might reflect a true and continuing decline in new AIDS cases rather than random variation in small numbers of cases reported at the beginning of a larger epidemic. Such a decline could be attributable in part to social and biological considerations and in part to preventive education and counseling efforts of the National Hemophilia Foundation, hemophilia treatment centers, CDC, and the Surgeon General of the Public Health Service.

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Tobacco Use Prevention and Cessation Programs in the U.S. Navy

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Synopsis

A representative sample of 406 U.S. Navy commands, including all medical treatment facilities, was surveyed in 1990 about their activities and programs to prevent the use of tobacco and promote smoking cessation during the preceding year. The vast majority of Navy commands (86 percent) provided some type of tobacco cessation educational materials or programs. However, the most common activities typically were rated as only

"somewhat useful" in helping to curb tobacco use.

Almost one-half of all commands offered psychological or behavioral cessation programs. Survey respondents estimated that approximately one-third of those persons who attended such a program stopped their tobacco use and nearly one-half reduced their tobacco use as a result of the program. Over-the-counter smoking cessation aids were not widely available at Navy exchange stores, individual commands, or medical treatment facilities. Furthermore, only 61 percent of all commands reported that they had a written policy or instruction regarding tobacco use.

Only about one-third of medical treatment facilities had a routine system for identifying tobacco users by glancing at their medical records. However, it was estimated that 80 percent of medical treatment facility physicians routinely asked their patients about their tobacco use. The authors discuss the need for a more active Navy approach in prevention and cessation efforts and a routine system for identifying tobacco users from their medical records. In addition, inequities in cessation efforts were found among command subgroups.

ALTHOUGH THE PREVALENCE of smoking among adults has decreased during the past 25 years, smoking still remains the single most important preventable cause of death in our society (1). While tobacco use continues to be a public health concern and challenge for the nation at large, it is of particular concern to the U.S. Navy. A 1988 Department of Defense study reported that nearly

44 percent of the Navy's force (more than 550,000 personnel) smoked compared with 29 percent of civilian adults in 1987 (2-4).

Part of this difference between Navy and civilian smoking rates can be attributed to differences in age, education, and other sociodemographic factors. However, even after adjusting for such factors, the prevalence of smoking has been shown to