

CONTINUING MEDICAL EDUCATION

AIDS—EPIDEMIOLOGY UPDATE 1986

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The fiery spell of AIDS epidemic has truly been known as an epidemic of fear. Whenever some new knowledge on AIDS has emerged, the fear has intensified. Recognition of the asymptomatic carrier-state; isolation of the AIDS virus from breast milk, semen, cervical secretions, saliva, tears, peripheral blood mononuclear cells, serum, plasma, urine, CSF and brain tissue; reports of widespread bi-directional sexual spread in Africa and its resemblance to the polio epidemic of early 50's, have intensified the concern far and wide.^{1,2}

The outlines of economic impact of AIDS are beginning to emerge. Every case of AIDS now costs as much as a heart transplant. Recent reports of AIDS having been detected in 18 cases in India until 18 July 1986 (15 in Tamil nadu, 2 in Maharashtra and 1 in Andhra Pradesh); that its wrath has claimed the first victim in Bombay on 9th June 1986; and a 24-year-old suspected AIDS victim has returned home from USA recently and took refuge at his home town in Hyderabad,^{4,5} boldly underline that the dreaded disease has at last captured India formally. And perhaps the foregoing facts have sent down shivers through the minds of most of us.

Evolution

Notwithstanding being American by adoption, the AIDS virus possibly originated in Central Africa. Known to be all American in initial dissemination, the disease spread to

most of the remaining world after a gap of 2 to 3 years. In an incredibly short time after the epidemic was reckoned, the virus was isolated in France and US. Soon, a highly productive cell culture system and tests for thorough screening of blood (ELISA/Western Blot) on a massive scale, could be established.⁷⁻⁹ Recently, in Japan, 27% of the hemophiles receiving factors VIII and IX concentrates revealed sero-conversion, contrary to none in non-hemophilic/homosexual groups. A very high incidence of sero-positivity in the centres for prostitution in Haiti, has perhaps been a reflection of the activity of holidaying American homosexual men, and the dire poverty prevalent in the island.³

Nevertheless, it is not evident why the disease did not manifest itself until recently, since old medical records at various centers in US and elsewhere failed to reveal any evidence of AIDS. Interestingly, the cases of AIDS detected in Central Africa were not from the known high risk groups. In addition, antibodies to HTLV were found in Central Africans, though it is not yet known if same is the case for HTLV-III, however.¹¹ The observed relationship between CMV and Kaposi's sarcoma, and between EBV and Burkitt's lymphoma, both endemic to Central Africa, provokes one to speculate that AIDS may also be endemic to this area. Could it be possible that the disease failed to cause an epidemic in such a geographic location because of lack of the life style practices such as male homosexual promiscuity and i/v drug abuse, which underlie the large scale transmission of this disease? Hopefully and pre-

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dictably, the on-going or the future advances would say if this hypothesis has any conviction.

Of the approximately 19,500 cases reported world-wide, 16,500 were in US, 1,650 in Europe and the rest elsewhere with almost 8,220 of them already dead. The cases detected in the US so far are perhaps the most unlucky ones of the estimated 1.4 million patients who are possibly already infected.¹²

Transmission

Casual contact : The fear of AIDS spreading through casual contact is surrounded by error and myth. Notwithstandingly, it has generated many political, legal and ethical dilemmas, leading to calls for quarantine, mass screening and expulsion of sero-positive subjects from military services or schools. Even refusal to care for AIDS patients has been condoned in some cases.² The AIDS virus, though subtle, is perhaps a poor pathogen.³ Current data indicate that occupational exposure to patients, aerosol route, casual contact, sharing a bus or a waiting room, talking to or shaking hands with a patient do not constitute any significant antecedents of AIDS infection.¹³ Friedland et al,¹⁴ in a recent study on 101 close non-sexual household contacts, exposed to 39 AIDS patients, for a median period of 22 months, failed to detect any infection in them. Antibody positivity for the only subject (a five-year-old child) was attributed to the vertical transmission of the virus in-utero or perinatally rather than horizontally. This should serve to dispel any doubt on the fact that non-sexual close or intimate household contacts, who are not born to AIDS patients, are at minimal or no risk for infection whatsoever.

Sexual contact and intravenous drug abuse : Sexual promiscuity is perhaps the greatest risk factor associated with the male homosexuals,¹⁵ who constitute by far the largest AIDS population (over 70% in US and almost 90% in Britain).¹⁶ Large number of sexual partners,

and exchange of blood by sharing contaminated needles (by drug abusers) help viral transmission. However, the disease spreads heterosexually too, which is probably the predominant mode of infection in equatorial Africa, where the female prostitutes appear to be at a very high risk for infection. But in US, the number of cases with implicated heterosexual spread is as few as 180 (M to F=152; F to M=28).² As of December 1985, of the 1000 female patients recorded at centres for disease control (USA), 53% were i/v drug users, about 15% were sexual contacts of high risk males, 10% were transfusion recipients and 22% had no known risk factor.¹⁷ However, a recent report suggested that 34% of male patients with no apparent risk factor, had contracted the disease from female prostitutes, and it was also found to occur in some of the heterosexual partners (male) of female i/v drug addicts.¹⁸

Recently, AIDS virus has been cultured from the vaginal/cervical secretions of sero-positive females (8 of 22 cases) and from the blood of 7 of the 13 women tested.^{17,19} indicating that female genital secretions may indeed be a source for sexual transmission to men. Similarly, male homosexuals are known donors in artificial insemination programme, and in July 1985, four women in this programme in New South Wales were found to be sero-positive, one of whom also developed lymphadenopathy.²⁰

Vertical transmission : Spread of infection from mother to fetus is now an established fact, the risk being as high as 50%. Clinical AIDS develops more often in the infected infants than in adults. Breast-feeding may also pose a hazard, as virus has been detected in the breast milk too.²

Transfusion associated AIDS : The disease developing after an ordinary blood transfusion is rather unusual (1 in 1,00,000), though four Australian premature infants had acquired it from one transfusion. But then, the incidence of sero-conversion in healthy hemophiles has been

steadily rising all over the world. In Germany, for example, it went up from 0% before 1980 to 53% in 1984; the situation in other countries like UK and France being no better, while in US the figure is as high as 72%.²¹ AIDS has been reported in patients with factor VIII (Hemophilia-A) and factor-IX (hemophilia-B) deficiency, more in the former who receive factor VIII concentrates, each unit of which is derived from the pooled blood of 2000 to 5000 donors (contrary to each unit of cryoprecipitate which comes from a single donor).¹¹

Intravenous drug abuse has been associated as the primary risk factor because 17% of AIDS patients in US belong to this group and recently in New Haven, sero-positivity was detected in 10% of the members of such a group.²² About 40 cases of AIDS have occurred in the high risk groups following hepatitis B vaccine, though the evidence to implicate the latter is not very imposing.¹¹

Needle-stick injury and AIDS : The fear has been widely expressed that needle-stick injury can transmit AIDS. Though possible, the risk is perhaps less than 0.5%. In two documented reports, sero-conversion in 2 health-care workers followed a micro-injection of contaminated blood into the finger and deep intramuscular inoculation of the same with a large bore needle, in UK and USA respectively.²³ The fact however, remains that the risk factor for AIDS is far less than that for hepatitis B in which 20 to 30% individuals may acquire the virus following needle stick injury. This is possibly due to the large difference in the concentration of the viral particles in blood (upto 10^{13} /ml for hepatitis B, against 10^4 /ml for AIDS). Caring for the AIDS patients, even with an intensive exposure to the contaminated secretions, therefore, does not constitute a high risk activity, though needle-stick injury should be avoided.^{2,25,26}

The Present

Hope and despair loom over AIDS in equal measure, and hence the question one would possibly ask next is, where we are now five years after detection of the epidemic in which humanity appears to have embarked on a mortal race with a novel pathogen of great subtlety. Lethal effect of the virus on T-cells and its nasty habit of frequently changing the antigenic spots to evade previously evoked immune responses are ostensibly the main reasons for devastation of AIDS. Hopefully, the monoclonal technology will identify the epitopes on parts of the antigenic molecules that pervade immune response to many variants and might be effective in neutralization of the virus, as the antibodies currently being measured do not do so. Nevertheless, though the epidemic is progressing at an alarming rate, there is some indication that the rate is declining in some parts of US. Moreover, amazingly, it did not spread to the other populations and remained largely confined to the known high risk groups, and also the distribution of the cases has been remarkably constant (in only 5%, the mode of transmission remained unknown). The picture is therefore clear. The disease spreads sexually, by injection of contaminated blood and vertically from mother to the fetus, other modes of spread being extremely rare. Persons at high risk are homosexually/bisexually active men, intravenous drug addicts, recipients of blood or blood products and the children born of infected mothers. At intermediate risk are sex partners of persons at high risk groups. Health care workers/persons in casual contact with patients, like food handlers, family members and co-workers constitute the lowest risk (virtually non-risk) group.²³

Thus, at the moment, past mid-1986, a number of informations are available on AIDS, each of which is as complex as the others and poised delicately.

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