

Commentary

Towards zero transmission of HIV through blood transfusion

Medicine as a scientifically validated discipline was the contribution of the 20th century. When the Spanish influenza pandemic struck the world in 1918, the only interventions in industrialized countries were through sanitation – segregation, prohibition of spitting in public, requirement of covering mouth and nose when coughing and sneezing, wearing surgical face masks – since no reliable diagnostics or specific therapeutics had been developed. Once microbiology could isolate and identify pathogens, human mastery over infectious diseases was rapid; pharmacology could develop anti-microbial drugs and vaccines could prevent selected diseases. Towards the last quarter of the 20th century, experts believed that the war against infectious diseases was more or less won through public health and medicine. Then, in 1981 a new disease was detected – the acquired immune-deficiency syndrome, AIDS. After its cause was discovered to be a novel retrovirus it dawned on the experts that new infectious diseases had been ‘emerging’ from time to time, and that new ones will emerge at unexpected times and places. In 1984 a virus was detected from a person with AIDS and was confirmed as its cause in 1985. The same year reagents were made in the USA for screening of donor blood for transfusion-recipient’s safety. All countries with public health infrastructure adopted several control measures including blood safety.

Picture India in early 1980s: in the absence of a public health infrastructure and no trained and empowered personnel deployed in the districts and cities, no one had the mandate to detect, diagnose and control diseases even in outbreaks. For a few prioritized diseases the Government had created special vehicles to fulfill the *public health function* of disease prevention. Thus, stand-alone vertical control projects had been functioning against tuberculosis,

malaria, leprosy, kala-azar and filariasis. On the other hand, no one seemed to be accountable to control other diseases. Many undiagnosed and/or uncontrolled outbreaks have occurred in recent years in Assam, Bihar, Uttar Pradesh, Odisha and Gujarat. There have been recurrent and widespread prevalence of cholera, enteric fevers, leptospirosis, scrub typhus, encephalitis, bacterial meningitis, anthrax, influenza and many more. We learn about outbreaks through media reports. Controlling diseases at the local level and informing the public of every outbreak are functions of the public health department, missing in India. There is much advocacy for universal healthcare in the country, but the medical profession and professional associations have been silent on the need for public health. The entry of AIDS in India must be seen against this backdrop.

The Christian Medical College (CMC) in Vellore, Tamil Nadu, a not-for-profit non-governmental organization, has a diagnostic virology laboratory functioning since 1967. In 1985, a retrovirus unit was opened and ELISA reagents were obtained for testing for HIV infection. We asked if the AIDS virus (then called HTLV III, now human immunodeficiency virus, HIV) had reached India. A systematic study was conducted with approval from the State Health Ministry and fund support from the Indian Council of Medical Research (ICMR)^{1,2}. In February and March 1986 we detected India’s first HIV-infected women who practiced for-fee sex work, in Madras (Chennai), Madurai and Vellore^{1,2}. This information was announced simultaneously in the State Legislative Assembly and in the Parliament in May 1986. Immediately the ICMR in partnership with the central Directorate of Health Services created an AIDS Task Force – thus was born one more vertical programme³. Fortunately the Vellore model of systematic screening for monitoring prevalence of HIV

infection every year was accepted by the Task Force and some 30 centres were opened for sentinel surveillance³. By 1992 when the programme was taken over by the Directorate under the newly established National AIDS Control Organisation (NACO), a multi-pronged matrix of interventions and nation-wide sentinel surveillance had already been ongoing³. Hospital infection control including safe blood transfusion was a part of the interventions³.

The CMC blood bank had been conducting routine screening of all blood donors for hepatitis B virus (HBV) infection from 1972⁴. Following the detection of one instance of transfusion-associated HIV transmission in Vellore in 1987, routine HIV testing was added in 1988⁵. Thereafter the Task Force was instrumental in making HIV screening in blood banks in India (as well as screening for HBV) mandatory in 1989³. Since then, over 2000 blood banks in India have been modernized, and a whole new branch of Transfusion Medicine has evolved. Blood Transfusion Councils have been established at national and State levels. Stringent quality control parameters have been defined. The goal is to reach nationally with zero transmission of HIV through transfusion. Long ago surgeons believed that all blood was clean and sterile; today it is mandatory to screen donors/donated blood for transmissible infections of HIV, HBV and hepatitis C in addition to malaria and syphilis⁶. Testing for microfilariae is optional as transfusion-transmitted microfilaraemia is only transient and self-limited.

These historical vignettes are presented here as the background against which the paper by Makroo *et al*⁷ on the prevalence of HIV among blood donors in a tertiary care centre of north India appearing in this issue must be appreciated. During 1999 to 2009, the prevalence among voluntary donors ranged from 0.12 (in 2002) to 0.39 per cent (in 2008), for a mean 0.247 per cent. As healthcare service is morally bound to provide the best quality in transfusion, the investigators have been using the fourth generation ELISA reagents that would detect P24 antigen in addition to anti-HIV antibody⁷. The antigen appears in blood in early weeks after infection, ahead of detectable antibody; thus the test method will capture those in the window period before antibody detection. Ideally viral nucleic acid testing method should be used to detect even those who would be infectious but not yet antigen positive. That method is already in use in CMC, Vellore.

What does this study inform about the epidemiology of HIV infection in north India? Unlike in some

countries where male-to-female ratio of infection is balanced, in India far greater proportions of men are infected than women. This is because the major transmission risk is for men having sex with women in sex-work⁸. For every such woman there are many men clients. Infected men are the vectors of transmission to monogamously married women; thus the gender-skewed prevalence continues as infection seeps into civil society, as confirmed by the blood bank study^{7,8}. Similarly, the age pattern also reflects the predominance of younger men with infection^{7,8}.

Among all diseases under vertical disease control programmes, HIV infection alone stands out with demonstrable decline in prevalence, thanks to the multi-pronged interventions, adequate funding and regular monitoring⁹. No other infection is monitored based on population denominator, even if on sample basis. The sample sizes are large and annually repeated^{3,9,10}. In spite of all such progress, unlicensed blood transfusion services and through them HIV transmission, continue as shown by data from NACO¹⁰. Among the estimated 120,000 new HIV infections, 1 per cent was through transfusing blood or blood products in 2009¹⁰. Ensuring quality of healthcare services including that of blood transfusion facilities in every district and city can be achieved only if public health infrastructure is established in every district and State, covering the whole country¹¹. Only public health officials can be empowered to monitor the functioning of healthcare services everywhere in quality and reach¹¹.

It is hoped that the Government will create the much-needed public health arm of health management, with empowered trained officers in every district and city, and that every healthcare facility practicing blood transfusion will be watched for adhering to the stipulated norms of quality parameters to prevent any transfusion-related infections. Only then will we be able to reach, and also document, zero transmission of HIV via blood transfusion.

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