

**Blood Products Advisory Committee Meeting
December 13-14, 2001
Gaithersburg, MD**

Topic I. Potential concerns for Simian Foamy virus (SFV) transmission by Blood and Blood Products

Issue: FDA seeks advice on its approach to assessing the possible transfusion risk from SFV.

Background:

Foamy viruses (FV), or Spumaviruses, belong to retroviridae family. The FV genome encodes the canonical retroviral *gag*, *pol*, and *env* genes, as well as at least two additional genes termed *tas* (*bel-1*) and *bet*. FV was first described in 1954 when it was found to contaminate primary monkey kidney cell cultures. Soon thereafter, FV was isolated from a wide variety of nonhuman primate species (1). The prevalence of FV infection in naturally infected animals is generally high and varies widely depending on the species and environmental condition (1). The seroprevalence is generally high in animals housed in captivity compared to animals in the wild. In 1971 a putative human FV was isolated from nasopharyngeal carcinoma (NPC) from a Kenyan patient (2). However, further analysis of the so-called human FV clone by several investigators revealed that it is a variant strain of chimpanzee FV. Nonetheless, this demonstrated human infection from SFV, and raised the question of disease association. The precise mode of transmission of FV is not well understood. So far the studies indicate that transmission can occur through saliva.

The mechanism of FV infection and disease potential have been studied in several animal models such as rabbits and mice (3, 4). Virus has been recovered from various organs from such animals. No pathology was noted in any FV-infected animals. A wide variety of diseases such as thyroiditis de Quervain, Graves disease, multiple sclerosis, Myasthenia Gravis have been tenuously associated with FV infection of humans (1). However, studies using multiple assays (western blot, RIPA, IFA and PCR) in combination for the detection of the virus, have failed to confirm the association of disease with FV in humans. Because of no definite FV pathogenesis in man or animals, this virus has been dubbed as “ a virus in search of a disease” (5).

Studies have also focused on determining whether specific human population is at risk to be infected by FV. The outcome of several studies over a period of time has shown that a significant number of people living in East and central Africa are seropositive by more than one assay. Recent studies with nonhuman primate handlers such as veterinarians and zookeepers have also indicated a small but significant number (1.8- 3.0%) are seropositive (6, 7). There was neither evidence of disease nor sexual transmission of SFV in one of the studies (7).

In addition, in a lookback study done by CDC and Atlanta Red Cross, they identified a blood donor who was confirmed to have been infected with SFV since at least 1981. Between 1992 and 1997 this person, unaware of his infection, had donated blood 6 times. Recipients of 7 components transfused between 3 and 35 days after donation were identified. Two recipients had died of unrelated causes. One recipient was alive but not available for testing. Four recipients tested negative for SFV 1.5 to 7 years after transfusion.

In conclusion at present there is not enough evidence to implicate FV as a cause of disease in humans, and transmission by blood transfusion has not been shown.

Current Concerns:

In May of this year, Health Canada researchers conducted an anonymous, unlinked SFV surveillance study of individuals who work with non-human primates. Indicative of SFV zoonosis, of the 46 participants tested, one serum sample reacted strongly while another serum sample reacted weakly to SFV proteins (western blot analysis). Based on these findings, there was a discussion by Health Canada whether the employees handling nonhuman primates should defer from donating blood, tissue or organs until more is known about the pathogenesis of SFV. As is evident from the literature survey, summarized above, there is no definite proof of SFV pathogenesis in humans nor is there evidence of SFV transmission by blood. However, SFV has been isolated from human peripheral blood lymphocytes exposed to nonhuman primates (7, 8). At present it appears that there is insufficient data to exclude the risk of SFV transmission by transfusion. Therefore, FDA in consultation with CDC and Health Canada seeks advice from the Blood Products Advisory Committee members.

CDC and FDA will present the outline of future studies in both monkeys and humans to address the question of possible SFV transmission by blood transfusion. Based on the outcome of these studies, FDA intends to reexamine the question of appropriate blood safety precautions at a future time.

Following are questions we plan to ask the BPAC members.

Questions:

1: Does the committee agree that the currently available data are insufficient to determine whether SFV can cause adverse health effects in humans?

2: Does the committee agree that currently available data are insufficient to determine whether SFV can be transmitted by blood transfusion?

3: Please comment on the adequacy of the proposed studies to evaluate SFV transmission by blood transfusion.

References:

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