Health Officials Seek Ways to Halt AIDS

A recent workshop considered the options for preventing the spread of the new immune disease; an easy solution is unlikely

On 4 January the Centers for Disease Control (CDC) convened a workshop at its Atlanta headquarters to assess the options for halting the spread of the new disease called acquired immunodeficiency syndrome or, more commonly, AIDS. The main topic of discussion was the possibility that the disease, which may kill up to 70 percent of the patients within 2 years of diagnosis, might be spread in blood and blood products.

The CDC recently reported that hemophiliacs are at high risk of contracting AIDS, which may be transmitted by an infectious agent in the blood clotting factor preparations that they take (Science, 7 January, p. 42). The Center's Bruce Evatt told the workshop that AIDS was the second leading cause of death for hemophiliacs in 1982, even though the disease was first discovered in hemophiliacs in the summer of that year. Eight hemophiliacs who had none of the other known risk factors died from AIDS, compared to some 40 who died of bleeding. James Curran, head of the CDC task force investigating AIDS, says, "The sense of urgency is greatest for hemophiliacs. The risk for others who receive blood products now appears small, but is unknown." Suspicion has been cast on blood products in addition to clotting factor, however. An infant contracted AIDS after receiving red blood cells that had come from a man who developed the disease several months after he donated the blood. The CDC is also investigating the cases of two adults who developed AIDS after receiving blood transfusions during surgery. The two did not belong to any of the known high-risk groups, which include, in addition to hemophiliacs, homosexual and bisexual men who are extremely active sexually, users of intravenous drugs, and Haitians. In each case, investigators have identified a blood donor who has certain characteristics associated with AIDS, including a particular immune defect, although neither donor has actually developed the disease.

The CDC investigators have also identified several AIDS patients who donated blood. None of the recipients has contracted the condition, but there is still cause for worry. Thomas Spira of the CDC points out that there may be a long lag period, a year or more, between the time of exposure to the causative agent and the onset of AIDS. In other words, although there is currently no firm evidence linking ordinary blood transfusions to transmission of the disease, it is too early to rule out such a link.

The workshop participants easily reached agreement on some preventive measures that might check the spread of AIDS. About 75 percent of the AIDS victims are homosexual or bisexual men in whom the disease is thought to be sexually transmitted. There was general agreement that homosexual men should avoid sexual contact with known or suspected AIDS patients, minimize the number of their sexual partners, and refrain from anonymous sexual contacts. Heterosexuals might follow the same suggestions because, according to Curran, there are indications that AIDS may also be transmitted by heterosexual sex and other forms of intimate personal contact, such as that between mother and child.

The seriousness of the threat of AIDS transmission by blood products and what, if anything, ought to be done in the current state of uncertainty remained thorny issues for the workshop participants. Not everyone agrees with the conclusion, accepted by CDC officials and many other investigators, that AIDS is caused by an infectious agent, presumably a virus, which could contaminate blood products. Louis Aledort, the medical director of the National Hemophilia Foundation, says, "I think it is too early to conclude that there is a transmissible agent. I can't rule it out but the data are not there yet." Aledort favors the idea that hemophiliacs, as well as homosexuals and intravenous drug users, because they are exposed to a great number of foreign antigens, experience a high degree of antigenic stimulation that effectively wears out their immune systems.

Nevertheless, because of the seriousness of AIDS, many participants were in favor of introducing measures to prevent persons with a transmissible agent from donating blood or plasma. The question is how to do this, especially in view of the long latency period of the disease and the possibility that many individuals who do not have full-blown AIDS may have a milder form or be asymptomatic carriers of an infectious agent.

Asking members of high-risk groups to voluntarily refrain from donating blood is one relatively uncontroversial approach, although it would probably not eliminate all potential carriers. Automatically excluding all members of high-risk groups is another, although this measure has the disadvantage of stigmatizing all homosexual males when only a fraction—those who are extremely sexually promiscuous—are likely to transmit an AIDS agent. Past and present users of intravenous drugs, who may be hepatitis carriers, and hemophiliacs are already excluded. Potential donors may also be screened for AIDS symptoms through a physical examination or a medical history.

Finally, the blood itself may be screened. Since the agent has not been identified, it would be necessary to use a "surrogate agent" as a marker for AIDS infectivity. The best candidate for this is an antibody to the core antigen of the hepatitis B virus. According to Spira, testing for this antibody in donated blood would detect about 90 percent of the donors who might transmit an AIDS agent, including persons with full-blown AIDS, those with the milder symptoms, and members of high-risk groups.

Some workshop participants favored requiring the test for all blood collection centers, but Aaron Kellner of the New York Blood Center dissented. "It is one thing to do these tests in the laboratory and another in the real world," he said. Kellner suggests that a few blood collection centers in the cities where AIDS is most prevalent—New York, San Francisco, and Los Angeles—undertake pilot projects to see if it will work.
studies to assess the feasibility and costs (including lost blood donations) of doing the antibody test.

The next step after the workshop is the preparation by CDC officials of a list of options for containing AIDS. This list will not be submitted to Edward Brandt, assistant secretary for health in the U.S. Department of Health and Human Services, whose office will decide which options, if any, to implement.

Meanwhile, hemophiliacs who need clotting factor face an uncertain situation. Carl Slatoff, a hemophilia specialist from University Hospitals in Cleveland, proposes that they might minimize their risk of AIDS by using clotting factor concentrate instead of cryoprecipitate. A given lot of cryoprecipitate is made from material donated by one individual whereas each lot of concentrate contains material from an average of 3000 donors. Cryoprecipitate may not be potent enough to control bleeding of some patients, however. The National Hemophilia Foundation recommends that new patients be given cryoprecipitate as long as possible, but that hemophiliacs who have already been treated should switch to concentrate.

Once SPECMAP workers had adjusted the climatic records of the three sediment cores to make the best match with the known short-period orbital variations, they found that the amplitude of each of the main eccentricity cycles of the past 800,000 years was proportional to the amplitude of the corresponding 100,000-year glacial cycle, according to John Imbrie of Brown University and SPECMAP. The correlation between the two near the 100,000-year frequency explains about 77 percent of the climate variance. On the basis of standard statistical techniques, Imbrie concluded that orbital variations accounted for 60 ± 10 percent of climatic variability in the range from 19,000 to about 100,000 years per cycle. Orbital variations are thus "the fundamental cause of the succession of the Pleistocene ice ages of the past 800,000 years," he declared.

Although some had questioned such uncompromising statements about the control of the ice ages (Science, 14 July 1978, p. 144), no one rose on this occasion to object. Not everyone would stand by that specific number; most felt that the statisticians could be left to fight over the meaning of such a calculation. Instead, the geologists and palaeoclimatologists, now thoroughly convinced of the connection, are eager to use orbital variations to sort out how climate varied in the past and what processes intervene between orbital variations and climate. One of the great mysteries has been how such large climatic changes could be prompted by such small effects on insolation. Only eccentricity variations...