The New England Journal of Medicine

Official Organ of
The Massachusetts Medical Society

PROSPECTIVE authors should consult "Information for Authors," which appears in the first issue of every volume and may be obtained from the *Journal* office.

ARTICLES with original material are accepted for consideration with the understanding that, except for abstracts, no part of the data has been published, or will be submitted for publication elsewhere, before appearing here.

NOTICES should be sent at least 30 days before publication date.

ALTHOUGH all advertising material accepted is expected to conform to ethical medical standards, acceptance does not imply endorsement by the *Journal*.

REPRINTS: The *Journal* does not stock reprints, and reprints of the MGH CPCs are not available.

EDITORIAL OFFICES: 10 Shattuck St., Boston, MA 02115.

SUBSCRIPTION PRICES: U.S. funds drawn on U.S. banks only: $75 per year (interns, residents $55 per year; students $45 per year). Pounds sterling drawn on London banks only: £48 per year (interns, residents £35 per year; students £29 per year). Remit sterling only to NEJM, 13 Colina Road, Tottenham, London N15 3JA, England. Remit dollars to London, or to U.S. business and subscription office: NEJM, 1440 Main Street, Waltham, MA 02254. Communications regarding subscriptions may be sent to either address. Please include current mailing label with renewal order.

Payments and correspondence for all subscriptions delivered to Japan should be sent directly to: Nankodo Co., Ltd., 42-6, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan.

TRANSFUSION-ASSOCIATED AIDS — A CAUSE FOR CONCERN

IN 1943 Beeson[1] first reported jaundice in patients who had received blood or plasma transfusions and suggested that their illness resembled infectious hepatitis. Now, some 40 years later, the transmission of hepatitis by at least four different blood-borne viruses is a recognized risk of transfusion, and numerous other infectious agents are listed as being transmissible by blood and blood products.[2] In this issue Curran and co-authors[3] present data suggesting that the acquired immunodeficiency syndrome (AIDS) should be added to that list. They report 18 cases of AIDS in adults who were not in a high-risk group but who had received a blood transfusion within five years before diagnosis. In seven instances epidemiologic investigation of the donors was complete, and in each case there was a donor either from a high-risk group or with an abnormal ratio of helper to suppressor T lymphocytes. It is interesting and perhaps important that no donor with clinical AIDS was identified, although in one reported case[4] a donor with AIDS was found among the 18 persons who donated blood to a newborn infant who later died with an AIDS-like illness.

The apparent conclusion, and the one favored by Curran et al., is that some cases of AIDS are caused by a blood-borne agent that is transmitted by transfusion. This conclusion also requires that there be a carrier state during which a person with infectious disease is healthy enough to be accepted as a blood donor. Although other epidemiologic studies have also suggested such a carrier state, these transfusion-associated cases provide an opportunity to evaluate it more carefully and to study the critical aspect of recipient susceptibility.

Of vital importance — and missing from the Curran paper — is information about what happened to recipients of other blood components from the donor who was identified as "suspect." Currently, most donations are channeled into component production; hence, more than one recipient is exposed to each donation. If recipients of other components from the suspect donation remain healthy, one must either postulate an agent of low infectivity and assign major importance to host factors or question the basic assumption of blood-borne spread. In addition, the identification of one donor from a high-risk category in recipients who received a median of 14 units does not necessarily implicate that donor as a carrier. Case-control studies in patients who receive similar numbers of transfusions for similar indications need to be performed before we can be sure that the finding of a high-risk donor is not due to chance alone. For example, in one study 6 of 26 normal male donors had abnormal ratios of helper to suppressor T lymphocytes[5]; hence, the finding of one such donor in patients who had received 14 units of blood is not surprising.

Despite these problems, Curran's data provide substantial evidence that transfusion-related AIDS does

occur. Whether the disease is caused by a transfusion-transmitted infectious agent is still unknown and will continue to be until further data are gathered or the agent isolated. The possibility of such transmission was anticipated in March, however, when the Food and Drug Administration requested that blood banks institute procedures informing members of high-risk groups that they should refrain from donating blood. That recommendation, arising from concern about a carrier state, has been instituted by the nation's blood banks and is expected to reduce the incidence of transfusion-related AIDS. Its effect, however, may not be evident for at least two years because of the long period between exposure to the putative infectious agent and the diagnosis of AIDS. Until then, additional case reports of transfusion-associated AIDS will almost surely heighten concern in the minds of the public. Physicians can and should reassure patients that appropriate steps have been taken to prevent members of high-risk groups from being blood donors, with the expectation that eventually this approach will reduce the number of cases.

Although the data from the Centers for Disease Control were not published until today, they had been extensively discussed, and the concept that AIDS may be spread by transfusion has been with us for over a year. During that year, widespread and, at times, unreasonable concern about AIDS and transfusion has developed to such a point that a few persons have refused even to donate blood for fear of getting AIDS. This unfounded anxiety, if left uncorrected, has the potential to interfere seriously with our ability to supply blood and blood components. Physicians must remind everyone that because blood donors are exposed only to new, sterile, and disposable equipment, transmission of AIDS by blood donation is impossible. All of us must encourage continued support of our voluntary blood banks, which now supply over 98 per cent of the nation's blood needs. Any important interruption of their operations will almost surely be followed by a serious blood shortage.

For recipients, physicians must weigh the risk of transfusion against the expected benefit. This concept is not new but has become more pressing, since one can no longer assure an anxious patient that he or she will not get AIDS from transfusion. Curran's data, although not perfect, are convincing enough to justify listing AIDS among the rare but possible complications of receiving blood transfusions. Currently the number of cases of transfusion-related AIDS is extremely low, especially in relation to the over 3,200,000 persons given transfusions each year in the United States. Even if there is a striking increase in cases over the next year, AIDS will remain an extremely infrequent complication of transfusion.

Blood banks have already taken steps to reduce the risk of transfusion-related AIDS by restricting donations from persons in high-risk groups. Autologous donation, which has been accepted for a long time and is recommended in some situations, may also be valuable, although the large number of transfusions received by the patients described by Curran et al. places an important limitation on its potential. Directed donations (donations designated for a particular patient) have been seen by some as a useful measure to reduce the risk of AIDS.[6] The concept that patient-selected donors are relatively safe has superficial appeal, but wide application of this approach would have undesirable consequences. Concern about this, especially about the potential undermining of our voluntary blood-bank system, and an unwillingness to see blood supplies separated into two categories (with the supposedly less-safe blood destined for the poor, the elderly, and the minorities) have led all major blood-collecting organizations to take strong positions against such programs.

Surely the most effective way to reduce all complications of transfusions, including AIDS, is for physicians to exert continued caution in the use of blood. Although blood components should never be used casually, this apparent new risk underscores the importance for physicians of carefully considering the expected benefits and alternative measures before prescribing transfusions.

The paper by Curran et al. adds at least one additional dimension to the dilemma of AIDS, because it expands the population at risk to include transfusion recipients. Although the risk is extremely low the concern is great, and physicians can expect potential recipients to be anxious. Patients should be reassured that blood banks are taking all possible steps to provide for safe blood transfusion. In turn, physicians should use these products when, and only when, they are unquestionably indicated.

Yale University School of Medicine
New Haven, CT 06510 JOSEPH R. BOVE, M.D.

REFERENCES

1. Beeson PB. Jaundice occurring one to four months after transfusion of blood or plasma: report of seven cases. JAMA 1943; 121:1332-4.
2. Conrad ME. Diseases transmissible by blood transfusion: viral hepatitis and other infectious disorders. Semin Hematol 1981; 18:122-46.
3. Curran JW, Lawrence DN, Jaffe H, et al. Acquired immunodeficiency syndrome (AIDS) associated with transfusions. N Engl J Med 1984; 310:69-75.
4. Ammann AJ, Cowan MJ, Wara DW, et al. Acquired immunodeficiency in an infant: possible transmission by blood products. Lancet 1983; 1:956-8.
5. Simon TL, Bankhurst AD. A study of surrogate tests to prevent transmission of acquired immune deficiency syndrome. Blood 1983; 62: Suppl 1:238a.
6. Ballas SK, Draper EK, Harris M, MacCarthy V. Designated blood donations. N Engl J Med 1984; 310:124-5.

TYPHOID FEVER TODAY

TYPHOID fever is almost always acquired by ingestion of food or water contaminated with excreta from a patient with typhoid or from a carrier.[1] Human beings are the only reservoir of *Salmonella typhi*, and control of typhoid fever has been achieved in many countries by limitation of the fecal–oral spread of the organism from person to person. Nevertheless, the disease con-