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Post-transfusion hepatitis

Despite advances in screening donors and in blood fractionation, post-transfusion hepatitis remains the major complication of the modern treatment of haemophilia. The diagnosis is usually inferred from abnormalities in the results of hepatic biochemical tests rather than from clinical evidence. Surveys in haemophiliacs have shown changes in the liver architecture consistent with previous viral assault,[1] including those of chronic persistent and chronic active hepatitis and of cirrhosis. Indeed, in some cases early death from liver disease might prove to be the price paid by haemophiliacs for the improved quality of life afforded by the easy availability of clotting-factor concentrates.

So while no one doubts that the only way to treat haemorrhage in severe haemophilia is by the rapid replacement of the relevant clotting factor,[2] considerable thought is being given to reducing the risks. Attention has focused on three practices: the risks of collecting plasma from paid as opposed to volunteer donors; the optimum size of the plasma pool; and attempts at removing the several viruses of hepatitis from blood products.

The risks of viral contamination are certainly increased if plasma is obtained by plasmapheresis of paid donors.[3 4] True, the sensitivity of testing for hepatitis B has been improved so that its incidence in patients given multiple transfusions is about the same from either paid or volunteer sources, but hepatitis B is a relatively minor problem. Hepatitis A is rarely, if ever, transmitted by transfusion,[5] but at least two other viruses attack the liver specifically, and it is these "non-A, non-B" agents which are thought now to be the main cause of chronic liver disease in patients with haemophilia—as was shown by Seeff's review[4] of post-transfusion hepatitis in the United States since the introduction of screening for HBsAg. Exclusion of donor blood positive for HBsAg has had a limited effect on the incidence of hepatitis. Most prospective studies of the disease since 1975 have shown an incidence of between 8% and 17%, with almost all cases being negative to testing for both hepatitis A and hepatitis B.

On the other hand, data from Veterans Administration studies have suggested that the most important predetermining factor in the development of post-transfusion hepatitis in non-haemophilic patients in the United States is commercial blood, the rate being six or seven times higher than in recipients of blood from volunteer donors. When a participating hospital changed from commercial to volunteer blood the incidence of post-transfusion hepatitis dropped from 25·7% to 8·1%—so that when commercial blood is excluded the incidence of hepatitis is lowered by 75%. Results such as these show emphatically that the "hepatitis bogy" has not been laid to rest.[6 7]

The second transfusion practice which causes controversy is the size of the donor pool. The more donors used for the preparation of a batch of material, the greater seems the likelihood of viral or other pathogenic contamination. Indeed, one suggestion has been that only single-donor cryoprecipitate should be used in severely affected haemophilic children,[8] and that the prescription of concentrates, which are prepared from up to 6000 litres of plasma, should be reserved for the treatment of life-threatening bleeds or to cover major surgery.[9] Stirling and his colleagues[10] have recently reported that over a five-year follow-up liver function deteriorated only in a group of haemophiliacs receiving factor VIII concentrate. There was no association between the use of cryoprecipitate and impairment of liver function in this study, in which the concentrated material was prepared solely from volunteer plasma fractionated from up to 600 donations by the Scottish National Transfusion Service. Stirling's results contrast with an earlier report[11] on 98 haemophiliacs, 68 of whom had abnormal liver function values, in which no correlation was found between biochemical abnormality and the use of concentrate or cryoprecipitate. Nevertheless, while the Scottish study incriminated multidonor concentrate, the results were not sufficiently clear cut for the authors to recommend limitation in the prescription of blood products for home treatment.

Thirdly, is it likely that the recipients of multiple transfusions can be immunised, or that the threat of hepatitis can be removed from donated blood entirely? Immunisation against hepatitis B is certainly a possibility,[5] but, in the absence of specific markers for non-A, non-B hepatitis, overall protection against hepatitis appears remote. A more likely possibility is that hepatitis-free blood products will become available, three recent reports suggesting that viral contamination may be removed by specific processing by chemicals, ultraviolet light,[12 13] or heating.[14] If these or similar studies prove that hepatitis-free products are commercially practicable a major and very welcome advance will have been made—but one that will also present yet another, and probably expensive, challenge to the underfunded and fragmented services in Britain.

[1] Preston FE, Triger DR, Underwood JCE, *et al.* Percutaneous liver biopsy and chronic liver disease in haemophiliacs. *Lancet* 1978;ii:592-4.
[2] Jones P. Hepatitis in haemophilia: an overview. In: Seligsohn U, Rimon A, Horoszowski H, eds. *Haemophilia.* Tunbridge Wells: Castle House Publications, 1981:123-4.
[3] Zuckerman AJ. Viruses transmitted by blood clotting factors. In:

Seligsohn U, Rimon A, Horoszowski H, eds. *Haemophilia*. Tunbridge Wells: Castle House Publications, 1981:125-30.
[4] Seeff LB. Post-transfusion hepatitis in haemophilia. In: Seligsohn U, Rimon A, Horoszowski H, eds. *Haemophilia*. Tunbridge Wells: Castle House Publications, 1981:131-9.
[5] Zuckerman AJ. Acute viral hepatitis. *J R Coll Physicians Lond* 1981;15: 88-94.
[6] McAuley C. Plasma exchange and the paid donor system. *Lancet* 1980;ii: 855.
[7] Hamblin TJ. Blood donors, paid or unpaid? *Lancet* 1980;ii:976.
[8] McGrath KM, Lilleyman JS, Triger DR, Underwood JCE. Liver disease complicating severe haemophilia in childhood. *Arch Dis Child* 1980;55: 537-40.
[9] Craske J, Dilling N, Stern D. An outbreak of hepatitis associated with intravenous injection of factor-VIII concentrate. *Lancet* 1975;ii:221-3.
[10] Stirling ML, Beckett GJ, Percy-Robb IW. Liver function in Edinburgh haemophiliacs: a five-year follow-up. *J Clin Pathol* 1981;34:17-20.
[11] Levine PH, McVerry BA, Attock B, Dormandy KN. Health of the intensively treated hemophiliac, with special reference to abnormal liver chemistries and splenomegaly. *Blood* 1977;50:1-9.
[12] Harris RB, Johnson AJ, Semar M, Delente J, Fields JE. Freedom from transmission of hepatitis-B of gamma-globulin and heat-inactivated plasma protein fraction prepared from contaminated human plasma by fractionation with solid-phase polyelectrolytes. *Vox Sang* 1979;36: 129-36.
[13] Lissner RW, Pincus H, Mortelmans P, Tanaka W. On the mutagenicity of beta propiolactone treated therapeutic blood products. *Abstracts of 1st International Haemophilia Conference*. Bonn: Institut für Experimentelle Hämatologie und Bluttransfusionswesen der Universität Bonn, 1980: 174.
[14] Schwinn H, Heimburger N, Mauler R, *et al*. A hepatitis-free factor VIII concentrate/proof of the efficacy of the heat treatment in solutions. *Abstracts of 1st International Haemophilia Conference*. Bonn: Institut für Experimentelle Hämatologie und Bluttransfusionswesen der Universität Bonn, 1980:177.

Less listening, more discussion

A fanfare of trumpets may or may not precede the platitudes of the minister of health at opening ceremonies of international conferences, but the pattern of the rest of the meeting is more predictable. The keynote review address given by a star performer is often a rehash of his own textbook. Original papers read by the naive to the gullible are often strongly represented by speakers from the host country. Perhaps the most pernicious device for cementing international friendships is the round table composed of the same experts each year. A large proportion of original papers given even at national meetings would not stand up to the scientific rigour of a referee and are never published in full.[1] Instead, the conference proceedings are published between one and two years later, and most of the copies will never be removed from their shelves.

What is the remedy? Instead of just moaning about the futility of these international jamborees Professor John Dobbing has tried to experiment with a new design of meeting. Seven authors were asked to write a paper on the role of maternal nutrition in the determination of fetal growth. The authors were chosen for their authority and for the variety of their views. Each paper was sent to the other authors in the group and also to six other people who had contributed substantially to the subject. All 13 were asked to criticise all the papers. The original papers and the criticism were circulated to all the participants several weeks before the meeting started—so giving them time to consider carefully all the written material, to examine appropriate references, and for the original authors to change their minds before the conference. The meeting itself consisted exclusively of discussion, with experts talking to each other and exposing the strengths and fallacies in their arguments. Such a format contrasts vividly with the conventional conference, where the pattern of presentation stifles discussion and the most valuable interchange of ideas is squeezed into the coffee break. The design of this meeting and the resulting book[2] must be rated as a highly successful experiment in communication—but some features need further development, and in particular the omission from the book of the discussions which took place at the workshop means that the cut and thrust of important debates are entirely lacking.

This type of meeting might seem to be suitable only for small groups, but the Society for General Microbiology holds annual meetings attended by several hundred doctors and has a similar arrangement. Its collection of papers is published by Cambridge University Press and sent to each participant a month before the meeting. Every member is expected to have read it before he attends. Though informed discussion takes place throughout the meeting, there is no method of publishing this material.

Whatever else, conference proceedings need to be published quickly, if at all. With proper organisation it is not difficult to achieve this. Whatever their status, authors who do not provide a full and final copy of their papers by the deadline set before the conference should not be paid their expenses or invited in the future. Contributions can be recorded on tape and an edited, shorter version typed immediately for approval by the participants at the meeting. In this way an edited version of the entire approved script of the conference can be made available to the printers only a few hours after the conference is over. Organisers, editors, and authors will all benefit from changes designed to convert conferences from entertaining circuses to productive symposia, and Professor Dobbing is to be congratulated on showing us how.

[1] Goldman L, Loscalzo A. Fate of cardiology research originally published in abstract form. *N Engl J Med* 1980;303:255-9.
[2] Dobbing J, ed. *Maternal nutrition in pregnancy—eating for two? Based on Nestlé Nutrition workshop, Chateau de Rochegude, Vaucluse, France, June 1980*. London: Academic Press, 1981.

Arthrogryposis multiplex congenita

When the prevalence of a congenital disorder varies considerably between countries and also over time its aetiology might be expected to be clarified by detailed epidemiological investigation. Arthrogryposis multiplex congenita is such a disorder. Affected individuals have multiple congenital articular rigidities, characteristically accompanied by muscle wasting, but no identifiable neurological abnormality. During the 1960s the prevalence of arthrogryposis in Helsinki was reported to be three per 10 000 births,[1] whereas only one case was recorded among about 56 000 births in the Edinburgh register of newborn babies in the same period.[2] Furthermore, hospital records in Britain, Australia, and the United States have shown a more than tenfold increase in diagnosis of the condition between the early 1940s and 1960s followed by a subsequent decline.[3] In South Africa a nationwide investigation in 1974 found only 26 cases, mostly in children; the oldest patient was aged 24.[4] Some of these variations in prevalence may have been due to differences in the extent to which associated abnormalities responsible for secondary congenital joint contractures were investigated and excluded from the figures; but in view of the similar pattern of changes over time in many countries diagnostic factors are unlikely to account for all the variation.