BLOOD PRODUCTS & THEIR PROBLEMS

Suprarегional Haemophilia Reference Centre, Royal Free Hospital, London

"..... *the goal of treatment with factor VIII is continuous replacement*, as in the treatment of ..... diabetes with insulin." (Macfarlane, Biggs & Bidwell, 1954).

Over the last 15 years, the amount of factor VIII used in the UK has increased at a rate of almost 20% annually - ie. usage has doubled every 4 years. It now stands at about 80 million units per year. The reasons for this increased usage are clear: demand has increased because the benefits of more intensive treatment have been obvious, both to doctors and haemophiliacs; supply of factor VIII has been available both to meet and fuel this demand. Can this 'demand pull/supply push' continue indefinitely, allowing us to achieve the goal of continuous prophylaxis for all haemophiliacs ? While we are dependent on human plasma as a source of factor VIII - and this will be for the next few years at least - the answer is unquestionably no, as foreseen by Macfarlane and his colleagues 30 years ago. To provide such prophylaxis would require 5 - 10 times as much factor VIII as we currently use. The world is short of plasma, we are short of money, and, depending on your viewpoint, the NHS may have *more pressing priorities*.

In the current difficult climate, in which many sectional interests are competing for limited health care resources, we need to ask ourselves:

- "What constitutes an acceptable standard of care for haemophiliacs in the UK in the 1980's ?"
- "How should the NHS rank the needs of haemophiliacs against the needs of other patient groups ?"
- "Are we living in a fools paradise ?"
- "Where do we go from here?"

I'm not going to attempt to answer the first two questions here. As regards the third, I would suggest, yes. In answer to the last, I believe it would be prudent for us to concentrate our efforts on preservation of what we have, rather than promotion of goals which cannot realistically be met. A major priority must be to reduce our level of dependence on imported plasma products. Not only haemophiliacs needing factor VIII, but also other patients who depend on different plasma products, have become worryingly vulnerable to international political, commercial and economic forces which are outside our control. If high standards of *treatment are to be preserved for the future, we need to become masters* of our own destiny.

It comes as a surprise to many to learn that the UK, with the notable exception of Scotland, is dependent on imported commercial plasma products. This is despite our long tradition of voluntary blood donation.

Currently, about two-thirds of the factor VIII used in this country is imported, together large quantities of albumin and some gamma globulin. The same is true for most Western countries, despite a World Health Organization (WHO) recommendation that each country should be self-sufficient. Of course, it is easy to achieve 'pseudo self-sufficiency' by banning importation (as has been done, for example, in Australia, but this is likely to result in supply shortages, and unacceptably low standards of treatment.

The only large country which is clearly self-sufficient, in the sense that surpluses of plasma products are available for export, is the USA, which probably produces at least 70% of total world supplies. There, plasma products are made by commercial companies from plasma collected on a massive scale from paid donors. In many respects, commercial plasma and products made from it are regarded as commodities in which there is an international trade, and whose prices and availability are determined by various market forces. One such factor, which is also of key importance in non-profit systems, is the balance between the usage of factor VIII and that of other plasma products, particularly albumin. Without a market for albumin, it would be uneconomic to make factor VIII, Another influence is what the local market will bear - the price of factor VIII varies greatly between countries. In the UK, the price of commercial factor VIII has been very low by world standards. There is little doubt that one main reason for this is the competition provided by the NHS. This competition has become less intense over recent years, as a decreasing proportion of total factor VIII used has been provided by the NHS. Our vulnerability to price increases and supply problems caused by external factors is consequently much greater than it was a few years ago.

Whatever ones opinions about the moral and ethical issues raised by viewing plasma products as merchandise, and the periodic debates concerning the relative health hazards of volunteer or commercial products, there is little doubt that haemophiliacs in the UK have good reason to thank the commercial plasma industry. This is not only because it has provided the factor VIII that the NHS has been unable to provide, but also because it has showed us that it is possible to collect vast quantities of plasma for fractionation, and how to achieve this. It has been claimed that it is impossible for a non-profit motivated Transfusion Service based on voluntary donations to meet the plasma product needs of a country with a large population. I don't agree with this view. However, I do believe that if we are to secure high standards of treatment for the future by reducing our dependency on imported plasma products, it will be necessary for us to learn some lessons from industry, and incorporate several features of commercial operations into the NHS system. It will also be necessary, for us in the rest of the UK, to look at the Scottish example.

One major bridge has already been crossed. After many years of procrastination by successive Governments of various political shades, the present Government has made a large investment (£25 million) in the construction of a new NHS plasma fractionation factory at Elstree,

Hertfordshire. Within two years, this factory should be capable of producing 100 million units of factor VIII annually, and this figure could be increased. All NHS requirements for other plasma products will also be met. However, there remains a problem. To produce these quantities of plasma products, collection of plasma will have to increase three or fourfold. Even with technical advances, this is going to be difficult.

Of the several reasons for the failure of the NHS to provide adequate quantities of plasma products over the last decade, I would select two as being dominant. Firstly, there has been a lack of co-ordination, co-operation and understanding between those responsible for formulating national policy (central Government and its departments) and those who have to implement this policy (Regional Blood Transfusion Services, BTS). This has been much less of a problem in Scotland, which has a different administrative system. To rectify these problems, organizational changes need to be made, perhaps by creation of a 'National Blood Authority', which would co-ordinate all activities in the field, attempt to resolve conflicts between local and national priorities, and have executive power to implement its policies. Probably, the system of financing the BTS would have to be changed. It would be important for patient groups and donors to be represented on such an Authority.

The second reason for supply inadequacies has been the orientation of the BTS and many clinicians towards the collection and usage of whole blood, rather than its separate components. Traditionally, the BTS had been 'red cell driven' - ie. the need for the red cell component of blood has been the main factor influencing numbers of donations and methods of collection. Since the last war, needs for plasma and other non-red cell components of blood have accelerated to outstrip needs for red cells. Especially over the last 15 years, the BTS has had difficulties in responding to this change. A large majority of the 2 million or so donations which are given annually in this country are in the form of whole blood. Plasma separated from about 40% of these donations provides the main source of NHS plasma for fractionation. There are many difficulties in increasing the proportion of whole blood donations separated into components but in theory, at least, a target of 80% might be met, thus doubling the quantity of plasma available. Clearly, however, even this would not be enough to meet the capacity of the new Elstree factory. An alternative possibility might simply be to collect more blood, and throw away unwanted red cells. For obvious reasons, this would be both unacceptable and uneconomic. A third hope is that technical improvements in blood collection and fractionation procedures may reduce the amount of plasma needed. These measures may certainly help, but I think they are most unlikely to solve the problem.

In my view, there is only one realistic way of overcoming our plasma supply difficulties, and that is to do what industry does. Commercial companies are not interested in the cellular components of blood - it

is intriguing that despite the large excess of plasma produced in the USA, supplies of red cells have frequently had to be augmented by importation from Europe. The companies collect plasma without cells by a technique known as plasmapheresis. In this technique, blood taken from a donor is separated into its plasmatic and cellular components, and the cells returned to the donor. Because loss of red cells is the main factor which limits the frequency of whole blood donation to about once every three months (providing about 0.8 litres of plasma per year from one donor, or 180 units of factor VIII concentrate), plasmapheresis makes it possible to markedly increase the donation frequency, and the amount of plasma obtained from each donor. A single donor plasmapheresed at the conservative rate of once per month could provide 6 litres of plasma per year, or 1350 units of factor VIII concentrate. Plasmapheresis is carried out on a small scale by the NHS, and to introduce a larger programme would require both financial investment in equipment and the manpower to run it, and some fundamental changes in operating procedures. Not least, such a programme would also need recruitment of a group of highly motivated donors. It has been claimed that it would be impossible to find such donors if payment could not be given as an incentive. I very much doubt this, provided that sufficient ingenuity and effort were applied to the problem. One possibility, for example, would be to seek the help of the Haemophilia Society. If the relatives and friends of each of Britain's 5000 haemophiliacs were able to recruit 5 new plasmapheresis donors willing to give plasma monthly, a third of this country's needs for plasma would be satisfied. Coupled with increased utilisation of plasma-reduced whole blood, self-sufficiency could become a reality.

rubbish

The standard of treatment available to people with haemophilia in the UK is widely recognised to be one of the highest in the world, but it has been bought at a price - dependence on a plasma product supply system which is outside our control, and cannot necessarily be relied on in the future. Not only because of our needs for factor VIII, but also because of our increasing requirements for many other plasma products, we must take urgent steps to reduce our vulnerability. The failures of the last decade should not dissuade us from expending maximum efforts to achieve the goal of self-sufficiency in blood products, because the climate has now changed, and the case is stronger than it ever has been.

Couldn't agree more!
Tell RTs.

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