

Leading article

Clinical interface of blood transfusion

Blood transfusion has recently been the focus of attention with respect to training of specialists in this field of medicine¹ and the overall organisation of the blood transfusion service in relation to the National Health Service.² Little attention, however, has been paid to the clinical interface of blood transfusion, an area of growing interest and change. The purpose of this article is to consider this aspect of blood transfusion so as to promote a better understanding of the organisation, professional regulation, and quality assurance of blood transfusion practice in hospitals.

Central role of the haematologist

In the United Kingdom transfusion is part of the speciality of haematology and the consultant haematologist is responsible for provision of the hospital blood transfusion service. Ideally, most haematology laboratories serving hospitals of the size of district general hospitals will have at least two haematologists, one of whom will have a special interest in blood transfusion. The proposed Joint Planning Advisory Committee (JPAC) reductions in senior registrar posts in haematology will at best delay, but most probably prevent the achievement of this objective, and the allocation of senior registrar posts to haematology should be revised at the earliest opportunity to ensure an adequate number of training posts to meet the need for blood transfusion specialists in hospitals and regional transfusion centres.

The haematologist is supported by a team of medical laboratory scientists specially trained in blood transfusion serology and immunohaematology.

Changing face of blood transfusion practice

The term "blood bank" is an outdated and inadequate description of the functions of the present day hospital blood transfusion laboratory which encompasses a complex clinical, laboratory, and research discipline. Transfusion practice today is orientated towards giving patients the blood component or plasma product best suited to their particular needs and is more appropriately described as blood component therapy. The responsibility for blood component

therapy extends beyond the laboratory to the bedside, and there are a growing number of clinical situations where special blood components and specialist haematological advice are required, including cardiac bypass surgery, hepatic surgery and transplantation, renal transplantation, bone marrow transplantation, supportive care of marrow depressed and immunocompromised patients during chemo- or radiotherapy, haemophilia, and other bleeding disorders, fetal and neonatal transfusion for RhD haemolytic disease and alloimmune thrombocytopenia, to list but a few. In addition to blood transfusion serology, a major function of the blood transfusion laboratory is that of diagnostic immunohaematology. The extent and local organisation of these and other transfusion related activities—for example, apheresis—vary depending on the special needs of the hospital, but should all be grouped together as a functional unit within the overall haematology service.

Supporting role of regional transfusion centres

Regional transfusion centres supply blood and blood products to hospitals in their region. Although the NHS aims to be self sufficient in blood and blood products, there is still a shortfall in some products, which can be met commercially in some cases—factor VIII concentrate, human albumin—or by hospitals providing their own special requirements for cellular components, such as platelet and leucocyte concentrates by apheresis techniques, often in conjunction with regional transfusion centres which provide selected walk-in donors.

While the production of factor VIII concentrate and human albumin currently depends on the supply of human plasma from whole blood donations and plasmapheresis, this position is likely to change with the impact of biotechnology.

In addition to supplying blood and blood products, the regional transfusion centres act as reference centres for difficult problems in blood transfusion serology. They also provide centralised routine services for some hospitals—antenatal serology, histocompatibility testing, and HLA serology. In most regions regional transfusion centres are separated, often by large distances, from the hospitals they supply, but in a few exceptional cases, notably in

Scotland, the regional transfusion centre is functionally linked with a hospital and operates its blood transfusion service.

At the clinical level, there is a direct link between the hospital haematologist and the director of the regional transfusion centre who may be consulted about clinical problems relating to blood transfusion. Closer clinical association with hospitals in the region is also being encouraged in the form of honorary attachment of regional transfusion centre consultants, which increases the attraction of consultant appointments in the blood transfusion service.

Management of blood usage

Record keeping is an essential part of the management of blood supplies. This can now be assisted by computerisation which makes available a greater variety of current statistical data than is possible with manual methods which are so labour intensive. For medical reasons (such as tracing transfusion transmitted infections) and to account for a valuable resource, records must permit the tracing of all blood and blood products from collection to transfusion or disposal, as recommended by the DHSS.³ These records must be kept at regional transfusion centres, hospital "blood banks" and at ward level in the patient's notes.

Supervision of the use of blood and blood products in hospitals is the responsibility of the haematologist. He/she should liaise closely with the regional transfusion centre to obtain adequate blood supplies to meet the clinical needs of the hospital, and be prepared to intervene when inappropriate demands are made. This requires close liaison with clinical colleagues and continuing education of junior medical staff who are usually responsible for ordering blood for patients. The issue of blood products needs a more professional pharmaceutical approach which is lacking in many hospitals. All blood products for transfusion, or related purposes such as prophylactic IgG anti-D, should be distributed through the blood transfusion laboratory with proper prescription documentation, as only then can the recommendations of the DHSS be met.³

Improvements in pretransfusion testing and the formulation of realistic guidelines for these procedures⁴ should encourage the wider use of selective blood ordering for elective surgery in place of "defensive" cross-matching just in case blood is needed. Selective blood ordering, which is based on preoperative grouping and antibody screening, aims to reduce unnecessary cross matching and to avoid reserving blood for patients who do not need it. Surgical procedures may be classified as "G and S" only—that is, group, antibody screen, and save serum—but blood is not cross matched unless an irregular antibody is detected—where experience has

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shown that less than 30% of cross matched blood is used, or those requiring cross matched blood according to a "tariff" agreed with the surgeons and anaesthetists.⁵

If blood has not been cross matched for a patient ("G and S" category) and there is unexpected blood loss during or after surgery, blood of the same ABO/RhD group can be issued subject to a rapid spin cross match. This approach to cross matching has led to more effective use of available blood stocks, less wastage due to out-dating, and a reduction in laboratory workload which releases technical staff to deal with urgent situations.

The computerisation of hospital blood transfusion data will make it much easier to assess the efficiency of blood use and determine the effects of any change of policy or procedure. The activities of different hospital departments, or of individual physicians or surgeons can thus be compared, and the blood use for different surgical procedures can be more accurately determined.

Ward procedure

To avoid possible blood transfusion mishaps it is mandatory to follow standard procedures at all times. The procedures should be agreed between medical and nursing staff and be part of the hospital's medical and nursing code of practice.

The decision to transfuse a patient and the request for grouping and cross matching is the responsibility of medical staff. Blood and blood products for transfusion should be made available only on written request signed by medical staff, as for other prescriptions. The ultimate safety of blood transfusion depends on accurate and unique patient and sample identification at all stages, starting with taking the blood sample from the patient for compatibility testing and ending with the transfusion of compatible blood. The procedure from "arm to arm" depends on a series of checks and double checks by responsible staff at each stage to minimize human error and ensure that the right blood is transfused to the right patient.

Hospital transfusion committee

In 1985 the British Committee for Standardisation in Haematology (BCSH) recommended that haematologists should consider the introduction of hospital transfusion committees, so widely used in the United States, to review local blood transfusion policies on a regular basis. There is already a line of communication between the regional transfusion centre director and the haematologist in charge of the hospital blood transfusion unit; this is particularly important with respect to use of blood and blood products in hospitals. The purpose of the hospital

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transfusion committee is to improve liaison within the hospital between the haematologist and other clinicians to promote good transfusion practice.

The committee should preferably be set up on a local basis, district rather than regional, and the membership should be representative of the various groups most concerned with blood transfusion practice. With so many interested parties there is a distinct danger of divided responsibility and areas of potential conflict where the transfusion committee can have a very important role.

Professional regulation and maintenance of laboratory standards

The Royal College of Pathologists, British Society for Haematology, Association of Clinical Pathologists, and more recently the British Blood Transfusion Society, founded in May 1983, are concerned with clinical blood transfusion practice.

The Royal College of Pathologists is responsible for training and examination in haematology. Blood transfusion is a major component of the final examination for membership and candidates must achieve a high standard in blood transfusion practice to be successful. In addition, specialist accreditation in haematology by the Joint Committee On Higher Medical Training requires a specified period of training in blood transfusion in an approved post.

The British Society for Haematology and British Blood Transfusion Society are represented on the British Committee for Standardisation in Haematology, a subcommittee of the British Society for Haematology, which makes recommendations for good transfusion practice through its blood transfusion task force. Recent British Committee for Standardisation in Haematology documents include *Guidelines on Hospital Blood Bank Documentation and Procedures* (1984), *Guidelines on Hospital Blood Bank Computing* (1986), and *Guidelines for Compatibility Testing in Hospital Blood Banks* (1987). Further guidelines in preparation include transfusion management of massive blood loss and autologous transfusion.

Laboratory performance is monitored by the National External Quality Assessment Scheme (NEQAS) for blood group serology. The DHSS funds

the scheme and appoints the organiser and an advisory steering committee. Although the scheme is voluntary, all NHS and private laboratories are encouraged to participate, and strict confidentiality is maintained between the scheme organiser and the participating laboratories. A laboratory returning persistently poor performance in NEQAS is referred for assistance to the National External Quality Assurance Advisory Panel for Haematology, comprising representatives of the Royal College of Pathologists, British Society for Haematology, Association of Clinical Pathologists, Institute of Medical Laboratory Services, and a co-opted member from the British Blood Transfusion Society. NEQAS is thus a self regulatory system. Ideally it should provide a critical assessment of worker performance. In practice, however, it tends to reflect the "best" laboratory performance, and should be supplemented by an in-house scheme based on regular assessment of individual worker performance to maintain the highest laboratory standards.

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