Hospital stocks and usage of platelets

Introduction and background

Over the last few years, hospitals have increasingly been requesting more group A than group O platelets for stock. A Blood Stocks Management Scheme Platelet Inventory Survey conducted in 2009 showed that in 2003, hospital platelet stocks consisted of 57% group O and 43% group A in comparison with 30% group O and 70% group A in 2009. The reduction in use of group O platelets for patients of other groups has been influenced by reports to the Serious Hazards of Transfusion (SHOT) haemovigilance scheme of rare serious episodes of haemolysis. Another factor influencing this trend is likely to be the reduction in hospital wastage of platelets when stocks consist of exclusively group A, since these platelets, particularly A RhD neg, can be regarded as “universal donors”. However, the disproportionate use of group A platelets impacts on the optimum use of blood stocks and impairs measures to reduce the incidence of Transfusion-Related Acute Lung Injury (TRALI) and vCJD.

The risks of transfusing platelets that are not ABO identical

Minor incompatibility (donor plasma contains antibodies against the A and/or B antigens on the recipient's red cells)

SHOT reports since 1998 have included 17 cases where group O platelets have given rise to haemolysis when given to non-group O recipients. 15 of the recipients were group A, one group B and one group AB. 4 recipients were < 5 years old, 4 < 18 years, 6 > 18 years and in 3 cases the ages are not known. In 9/17 cases, the platelets had tested negative for high-titre haemolysins.

All patients survived. (www.shotuk.org)

There are a further 29 similar cases in the literature, of which 14 occurred in patients > 18 years with 2 deaths directly related to the haemolysis in patients < 5 years. 1,2

These figures however should be seen in context. The four UK Blood Services have issued 3.4 million platelets over this period (although the proportion of those transfused with minor incompatibility is unknown) and therefore haemolysis can be considered a rare event.

Major incompatibility (donor platelets having A and/or B antigens expressed on the surface against which the recipient has the corresponding antibodies)

There is evidence of a modest reduction in platelet increment following the transfusion of platelets with major incompatibility, but a recent Canadian systematic review found that this does not influence the clinical outcome of bleeding.3
Adverse impact of preferential use of Group A platelets upon other known risks of transfusion

Transfusion-related acute lung injury (TRALI) is recognised to be the commonest cause of patient morbidity and mortality following transfusion. A key initiative taken by the UK Blood Services since 2003 to reduce this risk has been the preferential use of male plasma and male plateletpheresis donors. The use of apheresis platelets is also recommended to reduce donor exposure and the risk of transfusion-transmitted vCJD. However, to meet the requirement for more group A platelets, it is necessary to obtain platelets from both buffy coat pools and apheresis and to use donors of either sex; both of which are contrary to the current safety strategy and will increase risk to patients from TRALI and vCJD.

Summary and recommendations

- Haemolysis can rarely occur following the transfusion of group O platelets to non-group O recipients even when the platelet component has tested negative for high-titre haemolysins.
- The risk of haemolysis from transfusing group O platelets to non-group O recipients is greatest in paediatric patients (followed by adult patients with stable plasma volumes receiving support for thrombocytopenia).
- The risk of giving group O platelets to a non-group O patient in the context of trauma or massive haemorrhage is negligible.
- Hospitals should transfuse ABO identical platelets whenever possible, and it is important to avoid the disproportionate use of group A platelets ("universal donor") for patients of other groups in order to ensure the conservation of national platelet stocks and to avoid any adverse impact on vCJD and TRALI prevention measures.
- Large hospital users of platelets should stock a mix of group O and group A.

Acknowledgements

The Blood Stocks Management Scheme
Ensuring Provision of Optimal Platelets (EPOP) Project – NHSBT

References