Scottish National Blood Transfusion Service
Policy Record

Ref: NATP CLIN 035 04
Cat: Clinical

Title:

Transfusion Support for Patients undergoing Allogeneic Haemopoietic Stem Cell Transplant from a donor of a different ABO and /or RhD Group

Purpose:

This policy describes the roles and responsibilities of NHSS and SNBTS staff in ensuring appropriate transfusion support is provided for patients undergoing haemopoietic stem cell transplant involving an ABO and /or RhD group change.

Key Changes from Previous Revision
Change to point 6 to update in line with policy now in place at QEUH - routine DAT and anti-A, anti-B titres are no longer undertaken on a routine monthly basis. Also added in need to inform RTC of group change. All Rh(D) changed to RhD. Reference made to BSH guidelines. Appendix 2 removed and reference made to correct form to complete.

Policy Agreement	CGSC: N/A Minor Changes	SMT: N/A
Supersedes Policy Ref:	NATP CLIN 035 03	
Date Of Implementation:	5th August 2019	

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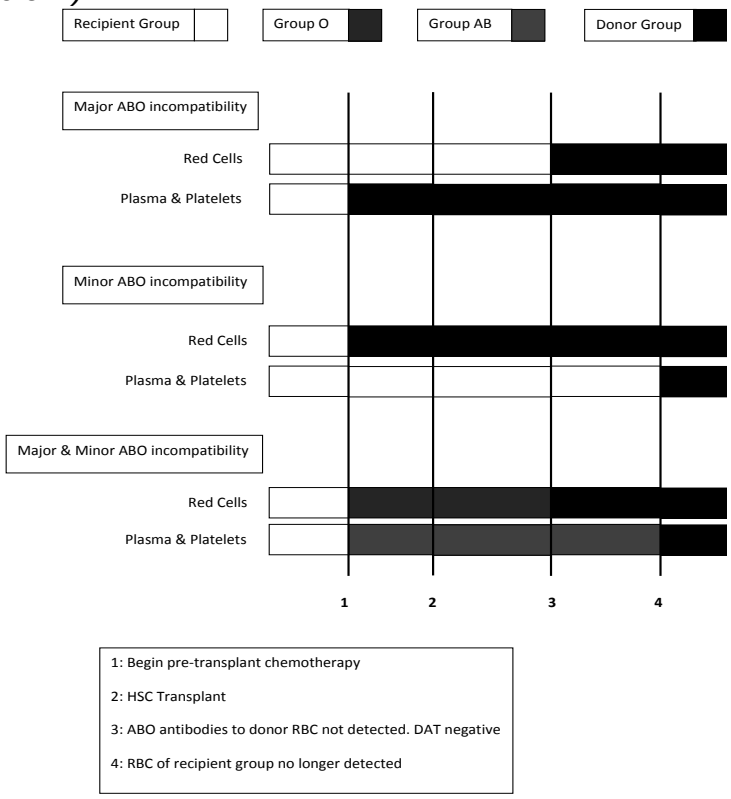
Background

Red cell incompatibility does not preclude allogeneic haemopoietic stem cell (HSC) transplantation because blood group antigens are not major histocompatibility antigens and HSCs do not express blood group antigens. However, appropriate transfusion support must be provided to prevent acute or delayed haemolytic transfusion reactions during transplantation due to ABO and or RhD incompatibility between donor and recipient. The types of ABO incompatibility are defined as:

- Major: alloagglutinins anti-A, -B or -AB reactive to donor red cells present in recipient plasma e.g. recipient Group O, donor Group A
- Minor: alloagglutinins anti-A, -B or -AB reactive to recipient red cells present in donor plasma e.g. recipient Group A, donor Group O
- Bidirectional: presence of reactive alloagglutinins in both recipient and donor plasma e.g. recipient Group B, donor Group A.

Appropriate blood group choices for transfusion support are summarised in Figure 1 and Appendix 1.

Figure 1: Transfusion support in HSC transplants involving an ABO group Change
(adapted from Practical Transfusion Medicine 4th edition, Murphy & Pamphilon, Chapter 28, page 312)



As the donor stem cells begin to engraft, the patient's blood group will begin to change and their serology will reflect this, with dual populations evident in cases where components have been

transfused. These results must be recorded and interpreted in a safe and systematic manner, and when appropriate, a patient's transfusion record must be altered to reflect the change.

Ensuring appropriate record keeping and transfusion support requires timely and accurate communication between the transplant team and the transfusion laboratory at the transplant centre, and dissemination of relevant information to all clinical teams that may be involved in the pre and post transplant care of the patient.

Principles

1. All patients who are to undergo a HSC transplant must have a **Transfusion Protocol** included in their transplant protocol drawn up by the transplant team. The transfusion protocol will include recommendations for selection of red cell, platelet and plasma components.

2. The patient's transfusion protocol must be sent by the transplant team in advance of the conditioning treatment start date to:
   - The transfusion laboratory at the transplant centre
   - The referring clinical haematology team
   - The transfusion laboratory in the referring clinical haematology team's hospital
   - BTS West of Scotland Reference Laboratory

3. The patient's transfusion protocol must be included in the patient's transfusion record in the transfusion laboratory's LIMS at the transplant centre and the referring hospital. SNBTS West of Scotland (WoS) Reference Laboratory will ensure that a patient record exists in the SNBTS LIMS.

4. The details to be made available in each of the LIMS include:
   - Date from which the protocol should be followed (from start of conditioning)
   - Patient blood group
   - Transplant infusion date (Day 0 on the protocol)
   - Donor blood group
   - Blood component requirements
   - Date after which a group change can be requested (minimum 28 days post infusion of HSCs)
   - Other information e.g. HLA matched platelets etc.

5. Pre-transplant serological testing must include ABO, full Rh Group, DAT and Anti-A and Anti-B titres (as appropriate)

6. Serological monitoring post HSC infusion, including DAT and relevant Anti-A and /or Anti B titres will be undertaken only upon receipt of specific request from the transplant team or referring Haematology team and not on a routine basis.

7. The serological tests that are required to establish that engraftment with a consequent blood group change has taken place are:
   - ABO forward & reverse group
   - RhD group
   - DAT
   - Anti-A and /or Anti-B titres as appropriate
   - Serological check using a compatibility test (IgG gel card cross match) with two donations matching the HSC donor blood group

A group change will only be confirmed if at least 28 days have elapsed since HSCs were infused and **all** of the above tests have been completed and the results consistent with the expected group change.

8. Where a patient remains in the transplant unit or is only being reviewed at the transplant centre, the serological tests required to confirm a blood group change will be undertaken by the transfusion laboratory at that centre (or by agreement, by the SNBTS WoS Reference Laboratory).

9. Where a patient has been discharged from the transplant unit and is being reviewed at another hospital before a blood group change has been confirmed, the serological tests required may be undertaken by the transfusion laboratory at that hospital (or by agreement, by transfusion laboratory at the transplant centre or the SNBTS WoS Reference Laboratory).

10. Confirmation of the blood group change must be communicated by the transfusion laboratory undertaking the relevant tests to the transplant team with a copy of the relevant serological test results, using the BMT Group email (GG-UHB.glasgowBMTconsultants@nhs.net). A standard reporting form will be used (GLAF CLS 357).

11. The transfusion laboratory undertaking the tests will amend the patient's record in their LIMS with the updated blood group. The record must include a note of the tests concluded, the date on which testing was completed and notification of the transplant team undertaken.

    Note: Once the group change has been made, a new sample will be required to initiate use of the new group for transfusion purposes.

12. The transfusion laboratory undertaking the tests to confirm a group change will also ensure that the test results and conclusions are distributed to (where applicable):
    - The transfusion laboratory in transplant centre
    - The transfusion laboratory in the referring clinical haematology team's hospital
    - SNBTS West of Scotland Reference Laboratory

13. The transplant team will include notification of the potential or actual blood group change (if confirmed) at the time of the patient's discharge from the transplant unit to the referring clinical haematology team.

14. Each transfusion laboratory receiving notification of a blood group change will make the necessary changes to their LIMS and include a note of the laboratory reporting the group change results and the date on which testing was completed.

15. Each transfusion laboratory involved in the care of patients before, during or after a HSC transplant must have a SOP in place that details the actions tailored to their LIMS that are required to ensure the electronic transfusion records are maintained in keeping with these principles.

16. Rarely, a sample from a patient who has undergone a HSC transplant and has had a confirmed group change recorded in the LIMS may produce results that are incompatible with the changed group (i.e. the donor group); this may indicate a change in the clinical circumstances of the patient.

    In this event, if there is a blood requirement, serologically 'safe' units should be selected as per the

original transfusion protocol and the transplant team should be notified using the group email given in paragraph 10.

A decision as to whether to revert to the patient's original pre-transplant group will be made in consultation with the transplant team and the necessary communications and actions undertaken as per the first group change event.

References

(1) Transfusion Medicine 2012, 23 (1). Milkins C. et al on behalf of the British Committee for Standards in Haematology. 'Pre-transfusion Compatibility procedures in blood transfusion laboratories'.

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Appendix 1

Selection of Blood Components in the immediate post HSC transplant phase (pre-engraftment)

The choice of components listed in the table should be continued until conversion to donor group is complete as demonstrated by the results of the investigations listed in section 7.

	Blood Group Details		Component Selection		
	Donor	Recipient	Red Cells	Platelets	FFP
Major ABO Incompatibility	A	O	O	A	A
	B	O	O	B	B
	AB	O	O	A	AB
	AB	A	A (or O)	A	AB
	AB	B	B (or O)	B	AB
Minor ABO Incompatibility	O	A	O	A	A
	O	B	O	B	B
	O	AB	O	A	AB
	A	AB	A (or O)	A	AB
	B	AB	B (or O)	B	AB
Bidirectional ABO Incompatibility	A	B	O	B	AB
	B	A	O	A	AB

Choice of RhD group

Major RhD incompatibility exits where a donor is RhD positive and the recipient is RhD negative. Give RhD negative components until RhD positive red cells are detected and a group change has been authorised; thereafter give RhD positive components.

Minor RhD incompatibility exists where a donor is RhD negative and the recipient is RhD positive. Give RhD negative components throughout.