LỰA CHỌN NHÓM MÁU TRONG TRUYỀN MÁU Ở SƠ SINH

TTYHCT: KHOA HỒI SỨC SƠ SINH

ĐẶT VẤN ĐỀ

- 82% trẻ SS <1.200 gr cần truyền máu ít nhất một lần
  - ✓ Mất máu
  - ✓ 0-5ml/trẻ 500 gr # 80ml/ người lớn 80 kg

NỘI DUNG

Câu hỏi 1: Khó khăn trong xác định nhóm máu ở trẻ ss?

Câu hỏi 2: Các xét nghiệm trước truyền máu?

- Tại bệnh viện Nhi Đồng 2
- Trên thế giới

Câu hỏi 3: lựa chọn nhóm máu khi truyền các chế phẩm máu:

- Hồng cầu lắng
- Plasma
- Tiểu cầu

TÀI LIỆU THAM KHẢO

- *Phác đồ sơ sinh bệnh viện Nhi Đồng 2*
- *FDA: Blood Grouping Reagent DG Gel 8 ABO/Rh + Kell*
- *Guideline blood tranfusion in UK (BJH), USA (AABB) -2016*
- *Neonatal Transfusion Practices – 2017*
- *Manual neonatal 2015 Blood products used in newborn.*
- *Uptodate 2017: Pretransfusion testing for red blood cell transfusion.*

1. KHÓ KHĂN TRONG XÁC ĐỊNH NHÓM MÁU SS

- Biểu hiện kháng nguyên ABO nghèo nàn
- Tạo kháng thể ABO ít do hệ miễn dịch chưa trưởng thành
- Kháng thể IgG ABO từ mẹ hiện diện trong tuần hoàn con (10% nhóm non-O)

→ có thể không xác định chính xác được nhóm máu ở trẻ SS

→ sàng lọc kháng thể từ máu mẹ (hạn chế lấy máu, mức độ dương tính mạnh hơn)

2. CÁC XÉT NGHIỆM TRƯỚC TRUYỀN MÁU?

- Tại bệnh viện Nhi Đồng 2:

1. Xác định nhóm máu trẻ bằng pp Gelcard
2. Thực hiện phản ứng chéo thuận tại giường
3. Truyền HCL nhóm O, Plasma AB, tiểu cầu cùng nhóm (Rh túi máu tương hợp với Rh bệnh nhân)

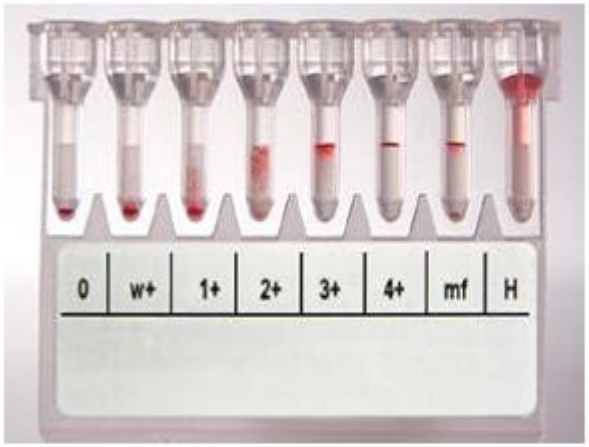

Figure 1. Picture of an example of reaction grades.

2. CÁC XÉT NGHIỆM TRƯỚC TRUYỀN MÁU?

- Trên thế giới (BJH-UK 2016 ,AABB- USA 2016)

Wherever possible, samples from both mother and infant should be obtained for initial ABO and RhD group determination.

Investigations on the maternal sample:

- ABO and RhD group.
- Screen for the presence of atypical red cell antibodies.

Investigations on the infant sample:

- ABO and RhD. ABO by cell group only, repeated on same sample if no historical result (a reverse group would detect passive maternal antibodies).
- Direct antiglobulin test (DAT) performed on the neonate's red cells.
- In the absence of maternal serum, screen infant's serum for atypical antibodies by an indirect antiglobulin technique (IAT).

Những khó khăn gặp phải?

1. Vắng mặt mẹ?

→ lấy mẫu máu thứ 2 (có thể có 1 mẫu từ máu cuống rốn)

1. Có cần lập lại xét nghiệm sau 4 tháng?

→ Nếu xuất hiện kháng thể bất thường (chứng cứ 2B)

Nếu kháng thể bất thường xuất hiện trong máu mẹ hoặc con hoặc test coomb trực tiếp (+) ở hồng cầu con cần xác định:

1.Kháng thể mẹ có khả năng gây bệnh thiếu máu tán huyết?

2.Kháng nguyên của trẻ có dương tính với kháng thể mẹ?

3.Bất tương hợp ABO mẹ và con?

4.Mẹ đã được dự phòng anti – D?

3. LỰA CHỌN NHÓM MÁU

Ở TRẺ LỚN: *TƯƠNG HỢP ABO*

Table I. Choice of ABO group for blood products for administration to children.

Patient's ABO group	ABO group of blood product to be transfused		
	Red cells	Platelets	FFP*
O			
First choice	O	O	O
Second choice	–	A	A or B or AB
A			
First choice	A	A	A or AB
Second choice	O†	O†	–
B			
First choice	B	B‡	B or AB
Second choice	O†	A or O†	–
AB			
First choice	AB	AB‡	AB
Second choice	A, B	A	A
Third choice	O†		

MANUAL NEONATAL

- HCL, Plasma, Tiểu cầu tương hợp ABO, Rh
- Plasma không tương hợp ABO trong túi tiểu cầu rất ít khi gây phản ứng tán huyết do đó Children Hospital, Boston cho phép truyền tiểu cầu đậm đặc nhóm O, B cho bệnh nhân nhóm A.
- Túi máu được chiếu xạ: tất cả trẻ sơ sinh

AABB guideline (*Clinical Transfusion Medicine Committee- USA*)

- Repeat ABO and Rh typing is not required for the remainder of the neonatal period up to 4 months of age; if the initial antibody screen is negative, *the patient is being transfused group O or ABO identical RBC units, and units are either D negative or identical to the patient's D type*.
- Due to the immaturity of the neonatal immune system, it is unlikely that alloimmunization to red cell antigens will occur during the first 4 months of life. *However if non-group O neonates (group A, B, or AB) are receiving non-group O cells incompatible with maternal ABO group, the neonate's plasma or serum must be tested for anti-A and anti-B antibodies.*

Guidelines on transfusion for fetuses, neonates and older children

Recommendations

1 Obtain the neonatal and maternal transfusion history (including fetal transfusions) for all new neonatal admissions. Obtain a maternal sample for initial testing when possible and use this for crossmatching if required (1C).

2 Laboratory control measures are required, ideally controlled by the LIMS, to ensure that units are ABO, D compatible with both mother and baby, and antigen-negative for clinically-significant maternal antibodies (1C).

8.3.1 Red cell selection: no maternal antibodies present

Select appropriate group and correct neonatal specification red cells. Group O D-negative red cells may be issued electronically without serological crossmatch. If the laboratory does not universally select group O D-negative red cells for neonatal transfusions, group selection should either be controlled by the LIMS to prevent issue of an incorrect ABO group of red cells, or an IAT crossmatch should be performed using maternal or neonatal plasma to serologically confirm ABO compatibility.

8.3.2 Red cell selection: maternal antibodies present

Select appropriate group red cells, compatible with maternal alloantibody/ies. An IAT crossmatch should be performed using the maternal plasma. If it is not possible to obtain a maternal sample it is acceptable to crossmatch antigen-negative units against the infant's plasma.

CHỌN LỰA CHẾ PHẨM HỒNG CẦU – NEOREVIEWS

- If the antibody screen is positive, RBCs that are compatible with the maternally derived antibody must be provided until the maternal antibody is no longer demonstrable.
- Leukocyte-reduced, gammairradiated, and ABO-Rh-compatible RBC products are used for transfusions in neonates, especially those whose birthweights are less than 1,200 g.
- *When group O RBCs are used for transfusing type A or B neonates, centrifugation before transfusion to remove the excess of plasma that contains anti-A and anti-B antibodies can reduce the risk of hemolysis in the neonate*

LỰA CHỌN CÁC CHẾ PHẨM KHÁC

Patient's ABO Group	Platelets	MB FFP & SD FFP‡	MB Cryoprecipitate‡
O			
1st choice	O	O†	O†
2nd choice	A, B or AB	A or B or AB	A or B or AB
A			
1st choice	A	A	A
2nd choice	AB	AB	AB
3rd choice	B*	B‡	B‡
4th choice	O*	—	—
B			
1st choice	B	B	B
2nd choice	AB	AB	AB
3rd choice	A*	A‡	A‡
4th choice	O*	—	—
AB			
1st choice	AB	AB	AB
2nd choice	A*	A‡	A‡
3rd choice	B*	B‡	B‡
4th choice	O*	—	—
Unknown			
1st choice	AB	AB	AB
2nd choice	A*	A‡	A‡
3rd choice	B*	B‡	B‡
4th choice	O*	—	—

THAY MÁU/TRUYỀN KHỐI LƯỢNG LỚN

- Cấp cứu: O Rh(-)
- Lý tưởng:

1.Tương hợp ABO máu mẹ & trẻ

2.Không có kháng nguyên tương ứng vs kháng thể mẹ

3.Tuổi của túi máu

4.Tình trạng chiếu xạ

5. CMV âm tính

6.Chất bảo quản phù hợp

1 ABO compatibility with mother and infant
2 Antigen-negative for maternal antibodies
3 Age of unit
4 Irradiation status
5 CMV negativity: there is acceptance that, in an emergency situation, leucodepleted components may be provided for recipients who would normally receive CMV-negative components
6 A component that satisfies the neonatal specification e.g. multi-satellite packs, MB FFP, HT negative red cells.

THỜI GIAN LƯU TRỮ TÚI MÁU (BJH GUIDELINE)

3.1.2.1. Component and procedure specifications. Red cells for ET should

- be group O or ABO compatible with maternal and neonatal plasma, RhD negative (or RhD identical with neonate);
- be negative for any red cell antigens to which the mother has antibodies;
- be IAT-cross-match compatible with maternal plasma;
- be 5 d old or less (to ensure optimal red cell function and low supernatant potassium levels);
- be collected into CPD anticoagulant;
- be CMV seronegative;
- be irradiated and transfused within 24 h of irradiation. Irradiation is essential if the infant has had a previous IUT and is recommended for all ETs (see Section 1.1.4 and Appendix 2). Irradiation for ET in absence of IUT is not essential if this would lead to clinically significant delay;
- have a haematocrit of 0·50–0·60;
- not be transfused straight from 4°C storage. If it is decided

TÓM LẠI:

- Ở trẻ sơ sinh, có thể không xác định được chính xác nhóm máu trong một số trường hợp, có thể tới 4^{th} tuổi.
- Cần truyền HCL, Plasma, TC phù hợp ABO và Rh, trong trường hợp cấp cứu ưu tiên HCL nhóm O, Rh (-) nếu ko xác định được nhóm máu.
- Các chế phẩm máu khi thay máu ở SS phải là những túi máu mới trong 5 ngày.
- HCL truyền ở SS là HCL đã được chiếu xạ để giảm lây nhiễm.

Xin cảm ơn quý đồng nghiệp đã chú ý lắng nghe

Table b. Red cell components for fetal/neonatal/infant/paediatric transfusion.

Component type	Component details and administration	Comments
All red cells	*Group and phenotype:*	
	Less than 4 months of age:	D-negative red cells should be selected for all D-negative patients less than 18 years old and all females of childbearing age.
	Compatible with maternal and neonatal ABO and D group (usually supplied as group O) and clinically-significant maternal antibodies.	Fetal/neonatal/infant specification red cells are currently K-negative (Appendix 1, Table a)
	From 4 months of age:	
	Compatible with recipient's ABO and D group and any red cell alloantibodies.	All females of child-bearing potential should receive K-negative red cells unless unavailable in an emergency (BSCH, 2013b)
IUT	Red cells up to the end of Day 5	Not stocked in the hospital BT laboratory, special order from the Blood Services
Approx unit volume 240 ml	Hct 0·70–0·85 Irradiated • shelf-life 24 h post-irradiation In CPD See Section 1.2.1 for administration details	• 'fresh' blood, within 24 h of irradiation to reduce the risk of hyperkalaemia • high Hct to minimize number of IUT procedures required • irradiated cellular components are recommended for infants up to 6 months of age post-IUT (BSCH, 2011b) For urgent and emergency situations refer to Appendix 3 for options when specific IUT red cells are not readily available

Neonatal exchange transfusion Approx unit volume 355 ml	Red cells up to the end of Day 5 Hct 0·5–0·6 (NHSBT provide 0·5–0·55) Irradiated • shelf-life 24 h post-irradiation. In CPD Transfusion volume: typically 160 ml/kg (double volume exchange) Transfusion rate: depends on clinical status of baby, discuss with NICU consultant	Not stocked in the the hospital BT laboratory, special order from the Blood Services • tight Hct range provided to reduce the chance of post-exchange transfusion anaemia or polycythaemia • irradiation recommended for all exchanges post- IUT, and for all others unless would cause undue delay (BSCH, 2011b) • 'fresh' blood, within 24 h of irradiation, to reduce the risk of hyperkalaemia • CPD instead of SAGM reduces theoretical risk of toxicity from mannitol and adenine additives (Luban *et al*, 1991) • exchange units contain 100–120 ml plasma with significant coagulation factor activity It is recommended that this component is used only for exchange transfusion of neonates ≤28 d of age, to reduce exposure of older infants to UK plasma and to reduce the theoretical risk of haemolysis from the (usually) group O plasma. If not used, may be reissued for patients born before 1 January 1996

Neonatal/infant small volume transfusions ('Paedipacks') Approx unit volume 45 ml (Six split paedipack from single-donor unit)	Red cells up to the end of Day 35 Hct approx 0·5–0·7 In SAGM additive solution • if irradiated, shelf-life for top-up transfusion 14 d post irradiation Transfusion volume: typically 15 ml/kg (for non-bleeding patients) or use transfusion formula (see Section 6.1.2) Transfusion rate: 5 ml/kg/h	Generally available from hospital BT laboratory stock *Note: specification is the same as for 'LVT' but units are split, and may have been stored at ambient temperature for up to 24 h before processing* • there is no requirement to use red cells before the end of Day 5 for neonatal top-up transfusions but caution should be exercised at high flow rates (Strauss, 2010b). To minimize donor exposure, consider age of red cells when allocating a set of paedipacks to a neonate requiring repeat transfusions • paedipacks are usually transfused on neonatal units; may be used for small infants on other wards • for maternity and specialist neonatal units group O D-negative paedipacks should be available for emergency use. Two paedipacks should provide sufficient volume for resuscitation (up to 20 ml/kg), ideally less than Day 14 to reduce the risk of hyperkalaemia (see Section 7.1.5) • group O D-negative adult emergency units are *NOT* suitable for neonatal resuscitation: they lack the additional neonatal component safety specification • if maternal and neonatal blood are stored in the same refrigerator they must be separated and clearly labelled