



SHOULD EMERGENCY RED CELLS BE ANYTHING OTHER THAN GROUP O?

BSMS ROADSHOW 2019

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OH
YES!



University Hospital Southampton



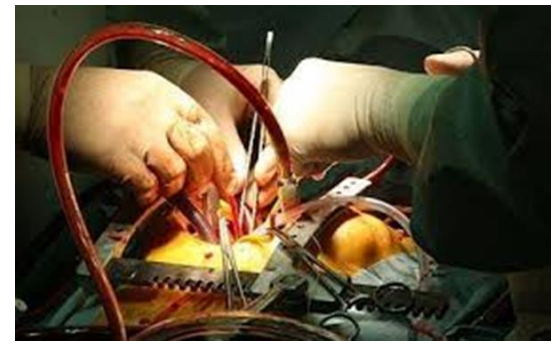
NHS Foundation Trust

SOUTHAMPTON UNIVERSITY HOSPITALS NHS FOUNDATION TRUST (UHS)

- Services 1.9 million patient
- 1600 beds
- 10,500 staff
- Teaching Hospital
- Foundation Hospital (since 2011)
- Research partnership with University of Southampton
- Values: Patients First, Working Together,

Always Improving

UHS SERVICES & TRANSFUSION CHALLENGES



- Centre of Excellence (cancer, respiratory, neurological, GI, Cardiac)
- Major Trauma Centre
- BM/SC Transplant Centre
- Cardiac Surgery (inc Paediatrics & ECMO)
- Foetal Medicine Unit (IUT)
- Maternity Hospital

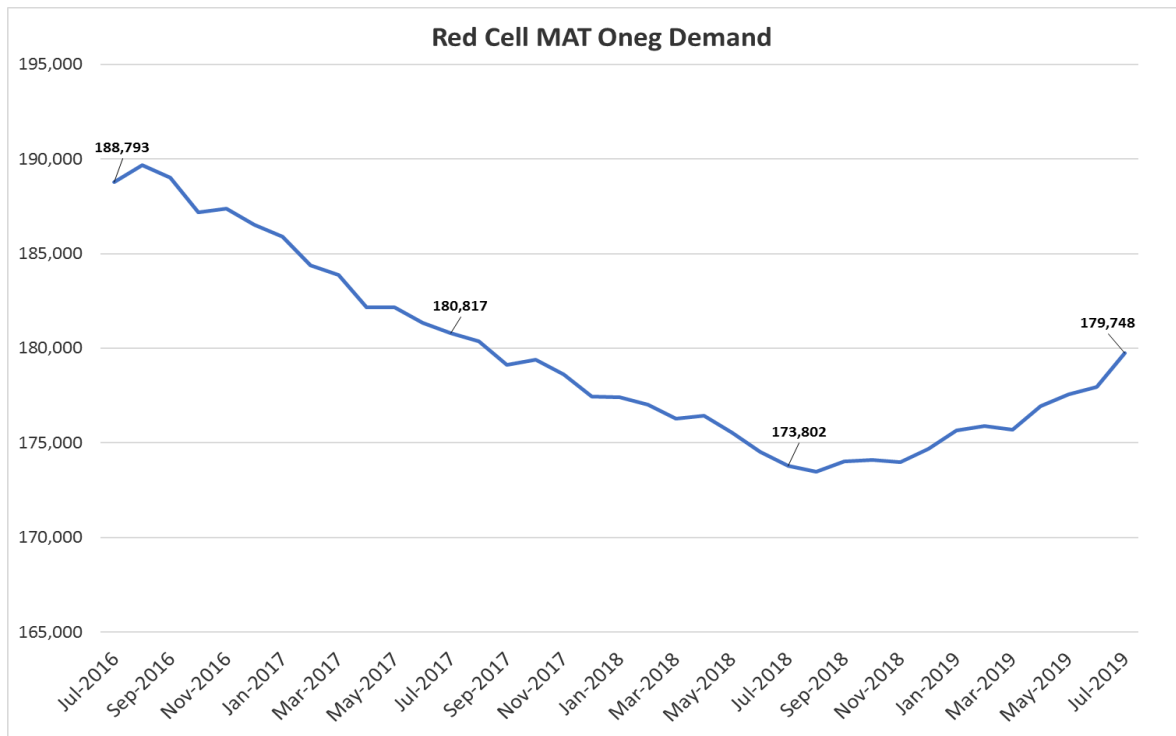


AIM

- To evidence that 'group O' only is not suitable for emergency blood provision in all patient populations
- To consider other approaches to the problem of supply and demand



BACK GROUND CONSIDERATIONS



Hospital demand for O neg 13-14%

8% population O neg

11% donors O neg

Demand may exceed supply

Provision of high spec units further complicates provision – reduces number of donations that are suitable

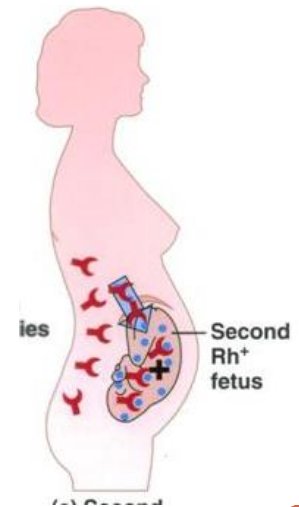
WHY EMERGENCY BLOOD?

- Lifesaving treatment for haemorrhaging patients whilst awaiting crossmatched components
- Unexpected event
- Often 'unknown' patients
- Can be required for male, female, adult or child

So why not just give group O with no other specification?

O D NEGATIVE

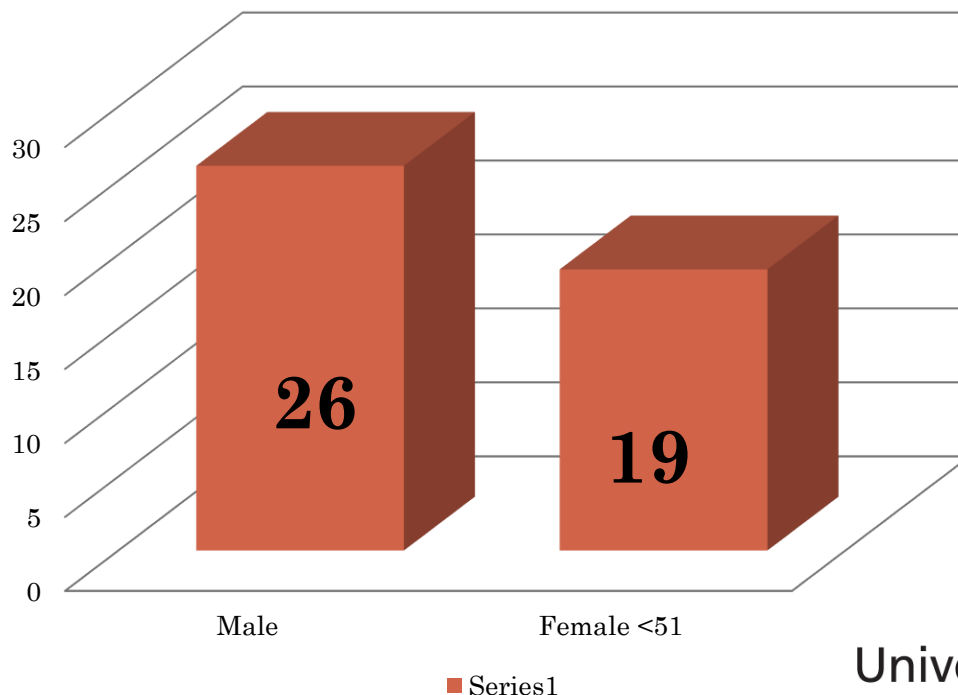
- Transfusion of D positive red cells to RhD negative females of child bearing age can lead to alloimmunisation
- Allo anti-D was the most common cause of HDFN prior to the advent of anti-D prophylaxis
- Healthy population exposed – 80% immunised
- Trauma patient 10-40% immunised



O D NEGATIVE



- Aren't most trauma patients male?? Does it matter – the numbers are low
- Audit emergency blood use UHS September 2019
- 45 instances



Its not just about trauma cases!

O D NEGATIVE



- 19 women transfused
- 20% = 4 women sensitised per month
- If only one of these women has a baby effected by HDFN is it worth the risk?
- Treatment of a baby with HDFN costs the NHS £40k-£120k
- Cost of an O negative donor drive?

O D NEGATIVE

- No problem – give them a dose of anti-D??



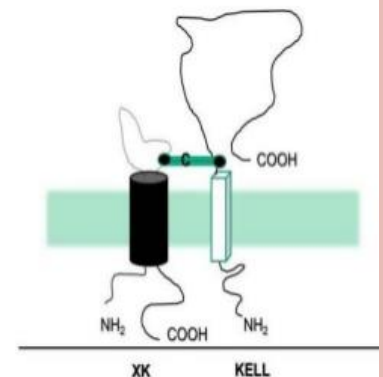
O D NEGATIVE

- IV administration required
- Unnecessary treatment with a human component
- Risks of anti-D
- Cost of anti-D
- Availability of anti-D



THE K ANTIGEN

- Kell antigens are the third most potent, after those of the ABO and Rh blood groups, at triggering an immune reaction.
- Cases of HDFN caused by Kell immunisation tend to result in severe fetal anemia
- anti-Kell antibodies target fetal RBC precursors, suppressing the fetal production of RBCs.
- 9% Caucasians K+
- Potential 5 women per year sensitised?



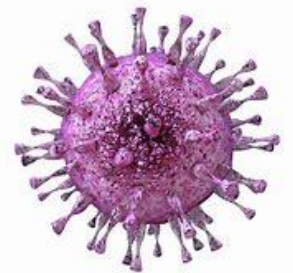
NBTC GUIDANCE

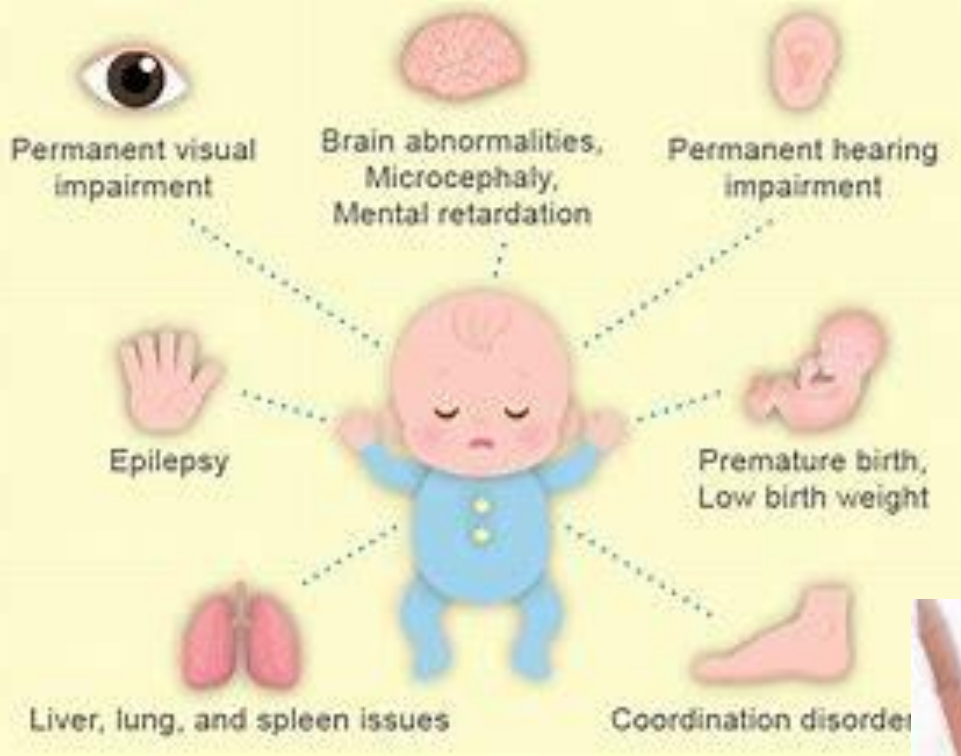
- Equal access to O D neg K neg RBC based on need
- D negative females (including D variants) and female patients of unknown blood group (in an emergency), with child-bearing potential (<50yrs old) should be given D negative red cells to prevent D alloimmunisation.
- All K- and K unknown female patients of childbearing potential should be provided O neg K neg components in an emergency

CMV NEGATIVE COMPONENTS

- Transmission of CMV through blood components can give rise to infection in naïve individuals
- Leucodepletion does not eliminate the risk of transmission
- 20% of babies that acquire CMV infection die
- 12% of hearing loss and 10% cerebral palsy cases are due to CMV infection
- CMV negative blood components are required for intrauterine transfusions and the transfusion of neonates and pregnant women
- If, in an emergency situation, it is not possible to provide CMV negative blood products, leucodepleted products of unknown serostatus may be used

(SaBTO position statement)





CMV NEGATIVE COMPONENTS

- If, in an emergency situation, **it is not possible** to provide CMV negative blood products, leucodepleted products of unknown serostatus may be used



- Is it possible? **Yes** it is

- Blood banks should provide O D- K- CMV- red cells for emergency blood in relevant clinical areas
- Maternity hospitals
- Common sense approach to requirements

CMV COST

- Congenital CMV estimated cost to the NHS for 2016

£732 million

- CMV unit supplement £9.07

CDE NEGATIVE

- Theory – if the recipient of the emergency blood is Rh neg they will likely be rr

Genotype	Caucasian frequency
Dce/dce	15%
dCe/dce	<1%
dcE/dce	<1%

CDE NEGATIVE

- Anti-e – rare antibody – weak immunogenicity
- Anti-e – rarely causes HDFN and is mild
- Anti-c – Causes HDFN and transfusion reactions? Conundrum

- Approx 1.7% of O D Neg Donors will possess either the C or E antigen (BSMS data 2018)
- Use these outside of an emergency situation
- Small numbers - ?worth the effort? – Resource into other means to conserve O neg



IRRADIATION?

- Gamma or X-ray irradiation to disrupt DNA of residual donor lymphocytes – stop replication and engraftment.
- Preventative measure for Transfusion Associated Graft versus Host Disease.
- Reportable error when requirement not met



IRRADIATION?

- Case study UHS
 - 41 year old male
 - Hodgkins disease
 - RTC – multiple injuries
 - 9 units of O pos blood given – non-irradiated
 - Follow up of patient – no sign of TaGvHD



IRRADIATION?



- Case study UHS
 - 6 month old child on ECMO
 - ECMO requirement for irradiation (exchange)
 - Emergency resuscitation
 - 2 unit EMO- given – non irradiated
 - Follow up of patient – no sign of TaGvHD
- What are the ethics if disease developed
- Leucodepletion - ?enough
- Consideration to at risk areas

ITS ALL ABOUT RISK PROBABILITIES?



What is an acceptable risk?

What do you think would be acceptable if you were a pregnant woman requiring transfusion?

NHS CONSTITUTION



University Hospital Southampton

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WHAT SHOULD WE BE DOING?



- Hospitals and NHSBT need to work together
- Hospitals use sex and age appropriate protocols for emergency blood
- Hospitals must implement the use of emergency O positive red cells for male patients
- Hospitals to actively manage and improve O neg stock holding and wastage
- NHSBT donor drives and education
- NHSBT sufficient CMV- components
- Implement 60 minute rule
- Hospital to consider high spec units requirement with a methodical approach and use lower spec units in other practice



SUMMARY

- Conservation and appropriate use of O neg red cells is imperative
- Hospitals should have emergency blood protocols that reduce the use of high spec O neg units
- BUT not at the expense of patient safety



QUESTIONS?



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