

Transfusion Management of Passenger Lymphocyte Syndrome at Leeds Teaching Hospitals NHS Trust

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Passenger Lymphocyte Syndrome (PLS)

- PLS is an Immune mediated haemolysis that can occur following ABO mismatched solid organ transplantation
- PLS is a primary or secondary response against the recipients RBC antigens
- Occurs when viable Lymphocytes from the donor are transferred to recipient and make antibodies that can cause haemolysis
- The more lymphoid the organ the greater the likelihood of PLS

Passenger Lymphocyte Syndrome (PLS)

- A type of graft versus host disease
- Onset of PLS is usually 1-3 weeks post-transplant
- PLS is a self-limiting process which usually resolves 3 months after the transplant
- Most commonly reported cases due to ABO
- Other antibodies implicated Rh, Lewis, Kidd and Duffy related

ABO incompatibility

Major incompatibility



Recipient lacks donor's antigens

Recipient can form antibodies against donor's antigens

Minor incompatibility



Donor lacks recipient's antigens

Donor can form antibodies against recipient's antigens

Bidirectional incompatibility



Donor lacks recipient's antigens

Recipient lacks donor's antigens

Both can form antibodies against the other

ABO incompatibility

RECIPIENT Blood Group	DONOR Blood Group
MAJOR ABO INCOMPATIBLE	
O	A
O	B
A	AB
B	AB
O	AB
MINOR ABO INCOMPATIBLE	
A	O
B	O
AB	O
AB	A
AB	B
BI-DIRECTIONAL INCOMPATIBLE.	
A	B
B	A

Laboratory Procedure Pre-transplant

- Sample received in laboratory for group and crossmatch
- LTH policy - crossmatch 5 units of blood
- Blood issued via electronic issue
- Electronic issue for 72 hrs post transplant
- Patients with any special requirements treated on an individual basis

Post Liver Transplant

- Transplant confirmed by transplant team
- Informs lab of date and donor blood group
- Patient excluded from electronic issue for 12 months
- Information recorded on LIMS
- Must have full group every time (forward and reverse)
- Issue of Anti-D immunoglobulin

Management of PLS

- Anticipation of PLS is important
- Anaemia induced by PLS is usually abrupt in onset
- Associated with a positive Direct Antiglobulin Test (DAT) as well as the presence of serum antibodies in addition to evidence of haemolysis
- Haemolysis is usually apparent between days 3-24 post-transplant
- Timing does not appear to be dependent on antibody specificity
- Blood samples are taken for a Haemolysis screen on day 5 post-transplant in order to identify the presence of haemolysis

Laboratory indication of PLS

- Unexpected reaction in reverse group/ positive control
- Positive crossmatch
- Positive antibody screen

Laboratory Investigations

- DAT
- Eluate
- Antibody investigation (if necessary)
- Blood selected for crossmatch to be compatible with donor and recipient

Blood Selection for Recipients of ABO Mismatched Organs

Recipient ABO blood group	Donor ABO Blood group	Red Blood Cell: recommended group	Platelets: recommended group	FFP/Cryoprecipitate: Recommended group
O	A	O	A	A,AB
	B	O	B	B,AB
	AB	O	AB	AB
A	O	A,O*	A	A,AB
	B	A,O*	B	AB
	AB	A,O*	AB	AB
B	O	B,O*	B	B,AB
	A	B,O*	A	AB
	AB	B,O*	AB	AB
AB	O	AB,A,B,O*	A	AB
	A	AB,A*	A	AB
	B	AB,B*	B	AB

Incidence of PLS at LTH

- Retrospective look back at Adult and paediatric Liver transplants over 18 months
- 221 liver transplants on 187 patients
- No post transplant sample on 56 patients
- 6 cases of PLS found
 - 1 due to Anti-D
 - 5 due to ABO antibodies
 - 4 Anti-A
 - 1 Anti-B
- 5% of Liver transplant cases at LTH resulted in PLS

Conclusion

- PLS is a frequent event
- Review of these 6 cases showed varying duration and severity of PLS
- Complications in patients avoidable with:
 - Early detection
 - Correct transfusion policy

References

Nadarajah, L., et al. "Literature review of passenger lymphocyte syndrome following renal transplantation and two case reports." *American Journal of Transplantation* 13.6 (2013): 1594-1600.

Marton, Ashley, et al. "Passenger Lymphocyte Syndrome Following Solid Organ Transplantation: Graft Source, Incidence, Specificity, Duration, and Severity Of Hemolysis." *Blood* 122.21 (2013): 37-37.

Thank you for listening
Any questions?