Alloantibody Testing of Platelet Refractory Patients

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Platelet Refractory Patients

Platelet refractoriness is the repeated failure to obtain satisfactory responses to platelet transfusions.

Can be immune and non-immune related

Need to provide best platelet product for the patient
Antigens presented by platelets

Human Platelet Antigens (HPA)

Class-1 Human Leucocyte Antigens (HLA)

Alloantibodies to these antigens can cause immune destruction of transfused platelets
HPA alloimmunisation

Not as common as HLA alloimmunisation

Most common alloantibodies involved in platelet specific refractoriness:

- anti-HPA-1b
- anti-HPA-5a
- anti-HPA-5b
PIFT

Platelet Immunoflorescence Test

Indirect Coombs test
IgG-AHG conjugated with florescent dye
Platelet cell suspensions are prepared from donor platelets
Measured by Flow Cytometry
PIFT

Can only detect the presence of alloantibodies

Can not identifying alloantibody specificity

Use for quick screening and for cross matching
GTI ELISA

Solid phase PAK 12G ELISA kit manufactured by GTI Diagnostics

Wells are coated with glycoproteins of known HPA types

One set of duplicate are coated in HLA class-1 antigens
GTI ELISA

Detects presence and specificity of HPA alloantibodies

Detects presence of HLA alloantibodies
HLA alloimmunisation

Major cause of immune platelet refractoriness

Due to HLA on platelets

Also HLA on white cells in platelet transfusion
LCT

Lymphocytotoxicity Test
Tissue Typing Laboratory, RBH

Dectes and specifies HLA alloantibodies

Does not test for HPA alloantibodies
HLA Correlation

45 samples tested by both methods
- 18 samples positive for HLA alloantibodies in both methods
- 23 samples negative for HLA alloantibodies in both methods

91.1% agreement between LCT assay and GTI ELISA assay

90% co-positivity & 92% co-negativity
Discrepancies

4 discrepancies in the 45 samples

• 2 samples positive in LCT method and negative in GTI ELISA

• 1 sample negative in LCT method and positive in GTI ELISA

• 1 sample negative in LCT method and weakly positive in GTI ELISA
Antigens

LCT method - made up of 60 lymphocyte cells with known HLA types
Varies from week to week, but generally is a cross section of the QLD population and always includes the common HLA types

GTI ELISA method - pool of at least 300 platelet donors
Need to provide best platelet product for patients

Identifying the cause and specificity of immune related refractoriness

Less transfusions

Less risk

Less use of platelet donations