eP059: Crossmatch Incompatibility following transfusion: Diagnostic Challenges and Differentiation of AIHA and DHTR – A Case Series

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BACKGROUND:

The Direct Antiglobulin Test (DAT) is a common finding in both Autoimmune Hemolytic Anemia (AIHA) and Delayed-Type Transfusion Reaction (DHTR), as both conditions involve antibody-mediated hemolysis. However, the underlying causes and clinical outcomes differ significantly.

OBJECTIVE:

To differentiate DHTR from AIHA by detailed medical review and pre-transfusion testing with history of transfusion.

METHODS:

- **Case Selection:**
  Five referred cases with suspected AIHA and transfusion history showing cross match incompatibility.

- **Immunohaematological Work-up**:
  - DAT, monospecific DAT, thermal specificity of suspected auto-antibodies
  - Antibody screening (AS) and antibody identification (AI) to rule out alloantibodies
  - Elution study and extended phenotyping

- **Case Evaluation:**
  - Comprehensive review of patient's medical history, transfusion history, and haemolytic markers.
  - Haematology consultations sought when necessary.

Case details	PT 1	PT 2	PT 3	PT 4	PT 5
Age/sex	73 y/F	21y/M	47y/F	19y/M	23y/M
Previous Tx	Yes, 2 units WB	Yes, 4 units WB	Yes, 4 units FFP	Yes, Multiple with PRBC	Yes, 2 units PRBC
Diagnosis	Diagnosed as AIHA (peripheral centre)	Beta -Thal Trait with suspected AIHA	DCLD , portal HTN & Anemia (?AIHA)	AIHA (K/C/O SCD)	AIHA (K/C/O SCD)
Hb	5.3mg/dl	2.4g/dl	2.3g/dl	5.1g/dl	4.8g/dl
Retic Count	32%	42%	5.04%	30%	Not done
LDH	609u/l	1426u/l	267u/l	1476u/l	Not done
Total Bilirubin	2.69mg/dl	2.48mg/dl	10.19mg/dl	4.02mg/dl	6.42mg/dl
Indirect	2.04hg/dl	4.07mg/dl	4.20mg/dl	1.16mg/dl	4.65mg/dl
DAT	Positive 4+ (Anti-IgG 3+)	Positive 4+ (Anti-IgG 3+)	Positive 3+ (Anti-IgG 3+)	Wk Positive	Wk positive
AS	Wk Positive	Pan-positive (2+)	Differential Pattern	Differential Pattern	Differential Pattern
AI	Anti E	Pan-positive 2+	Anti M	Anti E	Anti E
Elution study	Anti E	Pan-positive 2+	Anti M	Negative	Negative
Auto Control	Negative	Only +ve at 22^0c	Negative	Negative	Negative
Transfusion support	Managed without transfusion support	3 best match PRBC under steroid coverage	Antigen negative 1 unit PRBC	Antigen negative 1 unit PRBC	Antigen negative 2 units PRBC
IVIG + Steroids	Rituximab + Steroids	IVIG + Steroids	Steroids	Rituximab	Steroids
Outcomes	Recovered with Therapy	Stable at discharge	Expired, Septic Shock with DIC	Stable at discharge	Stable at discharge

CONCLUSION: The case series underscores the complexity of diagnosing DHTR versus AIHA. While a positive DAT is a common feature, the detection of alloantibodies through antibody screening and elution studies plays a pivotal role in differentiating between these two conditions. A comprehensive immunohematological evaluation, including extended phenotyping, is essential in cases with prior transfusion history to avoid misdiagnosis and ensure appropriate transfusion support.