Immunohematology Case Studies 2018 - #1

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Clinical History

A 31 year old female

33 weeks pregnant

Diagnosed with myxedema

Presented with anemia & low platelet count

Referred from a rural hospital of North Karnataka, for solving of blood group discrepancy

Serologic History

Patient blood group was recorded as O positive at the Primary Health center

Patient had history of one abortion and received 6 units of platelet (RDP) transfusion for thrombocytopenia

Current Sample Presentation Data

ABO/Rh:

Red cell typing: O RhD Positive

Serum typing: A

DAT: Negative

Antibody Screen Method: Column Agglutination & Tube

Antibody Screen Results: Negative

Current Sample Presentation Data

Blood typing by Column Agglutination

Anti-A	Anti-B	Anti-D	A_1 cell	B cell	O cell
0	0	+4	0	+3	0

A, B, D antisera: Ortho Clinical Diagnostics
Reagent red cells: In house prepared pooled cells
A1 & H lectin: Tulip diagnostics

- Anti-A1 lectin: Negative
- Anti-H lectin: Negative
- Anti-H (plasma from Bombay group): Negative

Autocontrol: Negative
DAT: Negative

Further Work-up to Determine if A Antigen Present

1. If patient is weak A phenotype, then why is H lectin negative
2. If patient is Bombay phenotype, why is 3 cell panel & O cells negative
3. Blood group reporting of the patient was a challenge

Interim Result
Possible Answers and Next Steps

Patient is Bombay phenotype since lacks H antigen

But possibility of weaker variant of A has to be ruled out

Need explanation of absence of anti-H in the patient

Further Work up

Cold Adsorption & Heat Elution

- Patient's Packed cells+ "B" group plasma: adsorption at 4C
- Elution at 56C waterbath
  - Patient's eluate + A1 cell – Negative
  - Pos Control Eluate + A1 cell – Positive
  - Neg Control Eluate + A1 cell – Negative

- No signs of weak A antigen on red cells

Further Work up

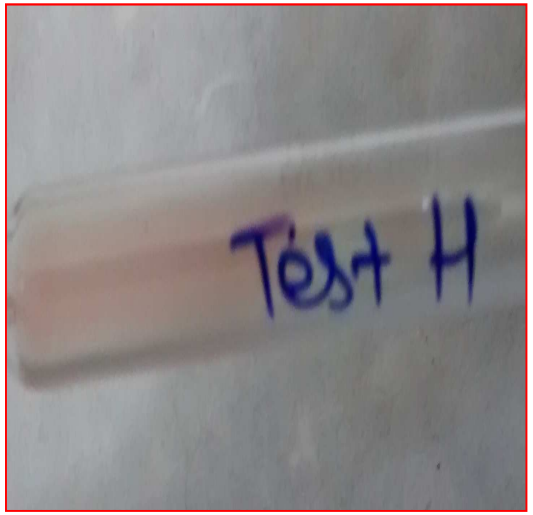
Compatibility Testing

1. Compatible with O donor cells
2. Compatible with A1 donor cells

Further Work up

Saliva testing (a type of ABH neutralization test)

	For A	For B	For H
Test	0	2+	0
Neg Control	2+	0	2+
Pos Control	0	0	0



Further Work

Interpretation from saliva test results:

Patient is

- Secretor of A
- Non secretor of B
- Secretor of H

Updated Clinical Information

- Patient was reported as Para Bombay Phenotype, i.e. a patient with an inactive *FUT1* gene but of the Secretor type
- Having weak or absent anti-H activity, that should mostly be considered as anti-HI

- Patient received one unit of red cell transfusion during child birth from Bombay blood group donor & transfusion was uneventful

Further Testing Results and Interpretations

Saliva testing suggested the patient is secretor of A & H

Cold adsorption & heat elution results ruled out possibility of weak A subgroup

Further work up confirmed Para Bombay phenotype

Conclusions

Classical Bombay group is *hh/sese*, i.e., lacking both H and Secretor gene function, whereas persons with *hh/Sese* or *hh/SeSe*, lack H antigen on RBCs but possess it in secretions and are referred to as para-Bombay or RBC H negative secretors

Summary of Case Challenges

During blood typing forward & reverse were not matching

Bombay phenotype could not be concluded due to absence of anti-H

Older serological techniques like cold adsorption & heat elution as well as saliva testing for secretor status helped in confirming Para Bombay Phenotype

Molecular investigation of the *FUT1* and *FUT2* genes available in some IRLs are also useful tools to confirm those rare phenotypes

Lessons Learned by the Case

- Blood group forward & reverse interpretation needs careful interpretation
- The reported prevalence of Bombay and para-Bombay phenotypes in Indians is reportedly 1/10,000 in different studies.
- However, since anti-H is not routinely used in blood grouping, many cases may remain undetected

References

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