

High Frequency antigen negative rare In(a+b-) phenotype in Indian patients producing anti-Inb: a case series

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INTRODUCTION

- INDIAN (IN) BLOOD GROUP SYSTEM:** ISBT 023 Discovered by Badakare and Co-workers in 1974
- Consists of 6 antigens: In^a, In^b, INFI, INJA, INRA and INSL
- The antigens in this system are located on CD44, a single-pass membrane glycoprotein, encoded by the *CD44* gene on chromosome 11 at position p13
- Two antithetical antigens: In^a present in ~10% of some Arab populations and in 3% of Bombay Indians
- Its allelic antigen In^b (IN*02) is a high frequency antigen present in >99% of the population
- Antibodies against these antigens are mostly IgG type, responsible for severe HTR

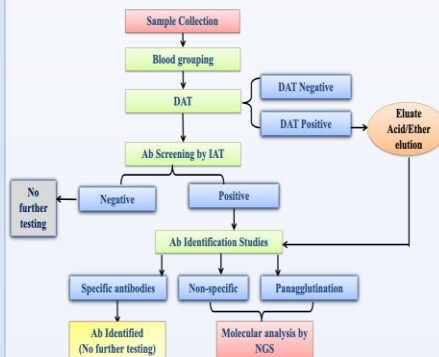
AIM

- To investigate the specificity of the antibody to the HFA using Targeted Next Generation Sequencing (tNGS) which will help in predicting the antibody specificity once the complete antigen profile of the patient is known.

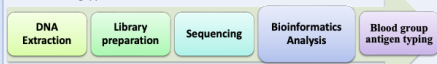
MATERIALS & METHODS

Cases	Age/Sex	Clinical History	Tx history	Hb (g/dl)
1	47/F	Multiple myeloma (transfusion required for surgery)	Yes	9.7
2	2/M	Multitransfused thalassaemic patient	Yes	4
3	24/F	Transfusion required for surgery	No	7.5
4	28/F	Women with bad obstetric history	No	10

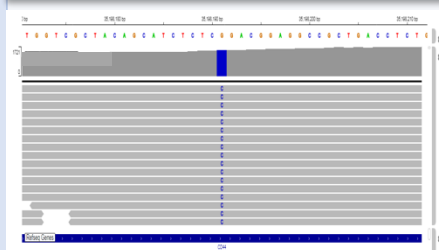
❖ Extensive immunohaematological workup



- Extended antigen typing** was carried using tNGS assay for 41 blood group systems
- Antibody specificity was predicted once the full antigen profile of the patient is known



RESULTS



Genomic analysis revealed "In (a+b-)" phenotype due to homozygous mutation c.137G>C in exon 2 of *CD44* gene

Antibody was predicted as anti-In^b

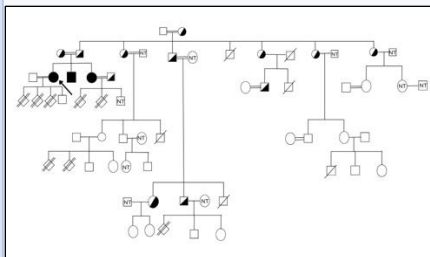
Predicted antibodies were further confirmed by using glycerol preserved In^b negative red cells.

In 3 patients antibody confirmed as anti-In^b

- One patient was incompatible due to additional antibodies
- Additional antibodies further confirmed by adsorption and elution method.

In 1 patient antibody confirmed as anti-In^b + anti-E

Extended family screening



Out of 22 members - Brother and sister were found as "In (a+b-)" phenotype

CONCLUSION

- High-throughput genotyping is an effective tool for resolving transfusion-related serological challenges and identifying rare donors
- Family studies led to the identification of 2 In(a+b-) rare donors
- The rare donors identified in this study will be registered in the Rare Donor Registry of India to facilitate the provision of rare blood units both nationally and internationally.

ACKNOWLEDGEMENT

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