Platelet Immunology
Case Study 2020-1
Prepared by:

Lucie RICHARD
Héma-Québec
Stem Cells and Reference Laboratory,
Saint-Laurent, Quebec, Canada

Gerald BERTRAND
BloodCenter of Brittany
Platelet Immunology Laboratory
Rennes, France
Introduction

Clinical history:

- 41 year old Canadian woman originated from Africa
- Fourth pregnancy (three voluntary abortions)
- Delivery of a male dead newborn at 39 weeks of gestation
- Newborn platelet count not defined, but intracranial haemorrhage identified as being the obvious cause of the death
Laboratory Investigation

Platelet Immunology laboratory of Hema-Quebec in Montreal:

- HPA genotyping of the parents: no incompatibility in HPA-1. Difference in HPA-5 and -15 observed (Table 1)
- No platelet antibody against GPIbIX, IaIIa, and IIbIIIa (MAIPA assay)
- Cross-match of maternal serum against father’s platelets also negative against GPIbIX, IaIIa, and IIbIIIa (MAIPA assay)
# Laboratory Investigation

## Platelet Immunology laboratory of Hema-Quebec in Montreal:

### Table 1: HPA Genotyping

<table>
<thead>
<tr>
<th>Genotype</th>
<th>HPA-1</th>
<th>HPA-2</th>
<th>HPA-3</th>
<th>HPA-4</th>
<th>HPA-5</th>
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<td>a/a</td>
<td>a/a</td>
<td>b/b</td>
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<td>a/a</td>
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<td>a/a</td>
<td>a/a</td>
<td>a/a</td>
<td>a/b</td>
</tr>
</tbody>
</table>
Laboratory Investigation

Platelet Immunology laboratory of Hema-Quebec in Montreal:

• Additional investigations performed with Luminex (PakLx): anti CD36 iso-antibodies identified in the maternal serum (Table 2)
• No additional testing can be performed on CD36 by Hema-Quebec
Laboratory Investigation

Platelet Immunology laboratory of Hema-Quebec in Montreal:

Table 2: HPA Serology results with PakLx kit
Laboratory Investigation

Platelet Immunology laboratory, BloodCenter of Brittany in Rennes:

- Anti CD36 iso-antibodies confirmed with PakLx
- Maternal serum Negative in MAIPA assay (monoclonal antibodies: FA6-152, 10,5 and TR9)
- Platelet phenotyping: CD36 Negative for the mother, and Positive for the father (Flow Cytometry) (Fig. 1b)
- CD36 gene exons sequenced (Fig. 1a)
Platelet Immunology laboratory, BloodCenter of Brittany in Rennes:

**Fig. 1a**

NM_000072.3:c.975T>G
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<table>
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<th>C</th>
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**Fig. 1b**

Counts

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<td>10^2</td>
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</table>

Mother | Father
Laboratory Investigation

Platelet Immunology laboratory, BloodCenter of Brittany in Rennes:

• Mutation on Exon 10 of mother’s CD36 gene, absent for the father: NM_000072.3:c.975T>G
• Mutation already been described as the most frequent in African people and already recorded as rs3211938 in the international database
Basis on CD36 Deficiency

- CD36: Multi-ligand receptor expressed on platelets, monocytes, macrophages, capillary and mammary endothelium, adipocytes
- 2 types of CD36 deficiency: Type I lacking CD36 on both platelets and monocytes; Type II only platelets affected
- Deficiency mainly observed in Asian and African populations (2-9%)
Conclusion

How to manage a future pregnancy:

• Non-invasive antenatal therapy based on intravenous immunoglobulin (IvIg). Only few cases of treated women in the literature
• Mother’s platelets collected before pregnancy, and frozen (if possible)
• Screening of CD36-deficient blood donors in Brittany
  ➢ Should we export this practice in other countries?
Conclusion

How to manage a future pregnancy:

- Platelet count of the newborn at delivery
- If severely thrombocytopenic:
  - Transfusion of mother’s platelets when collected before pregnancy
  - Transfusion of CD36 negative platelets if available
Lessons Learned by the Case

- Importance to know the ethnic origin of the family
- Think to screen CD36 antibody in case of Asian/African mother
- Try to collect maternal platelets or donor platelets if you can store it frozen
References

1. Curtis BR, Aster RH. Incidence of the Nak(a)-negative platelet phenotype in African Americans is similar to that of Asians. Transfusion 1996; 36(4):331-334.


Neonatal Intracranial Hemorrhage with a Dramatic Outcome Due to Maternal Anti CD36 Antibodies

Gérald Bertrand 1*, Virginie Renac 1, Marie-Christine Lefaix 1, Carl Nivet 1, Elise Trudel 2 and Lucie Richard 2

1 BloodCenter of Brittany EFS, HLA-HPA Laboratory, BP91614, 35016 Rennes Cedex, France;
virginie.renac@efs.sante.fr (V.R.); marie-christine.lefaix@efs.sante.fr (M.-C.L.); carl.nivet@efs.sante.fr (C.N.)
2 Héma-Québec, Laboratoire de Référence et des Cellules Souches, H4R 2W7 Saint-Laurent, Canada;
elise.trudel@hema-quebec.qc.ca (E.T.); lucie.richard@hema-quebec.qc.ca (L.R.)
* Correspondence: gerald.bertrand@efs.sante.fr; Tel.: +33-223-225-938

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