NORDLANDSSYKEHUSET NORDLÁNDA SKIPPIJVIESSO

Case studies: Rhesus incompatibility in pregnancy Mother O Rhesus D negative and newborn O Rhesus D negative

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Background:

When a pregnant woman is Rhesus D negative and is having a Rhesus D negative foster, it is unlikely that she will develop antibodies in the Rh-system. Less than 0.01 % of the population are RhD negative and Rhc negative. In this case, the pregnant woman was Rhc negative and formed the antibody: anti- Rhc. The foster is heterozygote Rhc positive.

Pregnancy care in Norway:

We routinely perform ABO/ RhD and antibody screening in the first pregnancy test as part of the pregnancy care program. RhD negative pregnant women are followed up with a control sample in pregnancy week 24 (antibody screening and fetal RhD typing of free fetal DNA). Pregnant women who carry an RhD positive fetus should be offered Rh prophylaxis in week 28 of pregnancy, post-partum prophylaxis (within 72 hours after birth) is determined by the result of the umbilical cord test. The purpose of the pregnancy tests is to reduce the risk of developing anti-D, as well as to find out if the pregnant woman is developing other antibodies against fetal blood cells that can cause hemolytic disease in the fetus and newborn. A number of different antibody specificities can cause hemolytic disease. Specificity and titer provide only partial information about the risk of such a disease and follow-up must therefore be performed individually by the attending physician / gynecologist.

Material and methods:

- All tests were analyzed in fully automatic gelcard-techniques on IH-500, Biorad. <u>Test cells (Biorad)</u> <u>Gelcards (Biorad)</u>
- ID- DiaCell I –II- III
- ID-DiaCell IP- IIP- IIIP
- ID- DiaPanel 11 cells
- ID- DiaPanel –P 11 cells
- Liss/Coombs
- NaCl, Enzyme Test and Cold
 - Agglutinins
- DiaClon Rh-Subgroups + K

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Table 1

Phenotypes (% occurrence) (Reid, Lomas-Francis& Olsson, 2012, s.192-193)

D-negative											
Phenotype (alternative)	Caucasians	Blacks	Asians								
r'r	0.8	Rare	0.1								
r'r'	Rare	Rare	0.1								
r"r	0.9	Rare	Rare								
r"r"	Rare	Rare	Rare								
rr	15.1	6.8	0.1								
r'r'' (r ^y r)	0.05	Rare	Rare								
r'r ^y ; r''r ^y ; r ^y r ^y	Rare	Rare	Rare								
r' ^s r	0	1-2	0								

Case:

Pregnant women, born 1990

The tests during pregnancy

Pregnant week 12: The first pregnancy sample

Figure 1: Antigen-table used for the identification of the antibody

Results:

A pregnant woman was admitted to the maternity ward and gave birth to a healthy child without any complications. Blood samples were taken to test the blood type and antibody screening. The antibody screening turned out to be positive and we discovered that she had develop anti-Rhc. We informed the maternity ward that we didn't have any blood available due to the antibodies she developed. This time there was no need for blood transfusion. A letter was sent to the patient in which she was recommended to become a blood donor (Autologous blood donation), so that we could freeze blood for a

- Typing: O Rhesus D negative, antibody screening: negative
- Pregnant week 24: The second pregnancy sample
 - Antibody screening: negative, Fetal Rhesus D: negative
- Labor week 40:
 - Typing: O Rhesus D negative
 - Antibody screening: positive → identified as anti-c (little), titers: 16
 - DAT: negative
 - Phenotype: r´r´ (C+, D-, E-, c-, e+)

Newborn, born 2019:

- Typing: O Rhesus D negative
- Antibody screening: positive \rightarrow identified as anti-c (little)
- DAT: positive 2+
- Phenotype: r´r (C+, D-, E-, c+, e+)

The newborn is typed c+ positive and monitored closely for hemolytic disease.

possibly transfusion in the future. She was also informed on future pregnancies risk.

Discussion:

• Is there blood in Norway for the women?

- We have checked with the national blood bank in Norway (Oslo Universitty Hospital) and Helse Nord neither of them have any blood bags available.
- If the mother needs transfusion?
 - We would have taken into account that she has developed anti-c, so it would have been best to give
 - RhD positive blood. R1r' would have been best, but this phenotype is also rare. So we would probably

end up with R1R1 with the risk of anti-D immunization

References:

Table 1: Reid, M., Lomas-Francis, C. & Olsson, M. (2012) The blood group antigen factsbook. London: Elsevier