



Fetomaternal haemorrhage in vaginal deliveries

Lubusky M.^{1,2}, Simetka O.³, Studnickova M.¹, Prochazka M.¹, Ordeltova M.⁴,
Vomackova K.⁵

¹Department of Obstetrics and Gynecology, University Hospital, Olomouc, Czech Republic

²Department of Medical Genetics and Fetal Medicine, University Hospital, Olomouc, Czech Republic

³Department of Obstetrics and Gynecology, University Hospital, Ostrava, Czech Republic

⁴Department of Allergology and Clinical Immunology, University Hospital, Olomouc, Czech Republic

⁵Department of Surgery I, University Hospital, Olomouc, Czech Republic

AIM OF THE STUDY

Determine the incidence of fetomaternal haemorrhage (FMH) in vaginal deliveries, determine the volume of fetal erythrocytes that infiltrate maternal circulation and identify risk factors, which lead to excessive FMH. Establishing these parameters could allow optimization of recommendations for the prevention of RhD alloimmunization.

WORKING HYPOTHESIS

A 10 µg dose of IgG anti-D administered intramuscularly should cover 0.5 ml of fetal RhD positive erythrocytes or 1 ml of whole blood. In the great majority of deliveries, less than 2.5 ml of fetal erythrocytes (5 ml of whole blood, sufficient dose of IgG anti-D 50 µg) enter maternal circulation. During delivery, only rarely does FMH occur, which surpasses 5 ml (10 ml of whole blood, sufficient dose of IgG anti-D 100 µg). **However, no risk factor is present in the majority of such deliveries.** The risk of fetal erythrocytes infiltrating maternal circulation is increased in cases of stillbirth, traumatic vaginal delivery, multiple-birth delivery, delivery with signs of placenta previa, delivery with pathology in the third stage of labour, etc.

METHODS

In the pilot study, a total of **924** examinations were performed. The amount of fetal erythrocytes which infiltrate maternal circulation during vaginal delivery was established by flow cytometry using the BDFACSCanto flow cytometer (Becton Dickonson International).

Laboratory processing: Fetal Cell Count™ kit (Diagnosis of Feto-maternal Transfusion by flow cytometry), IQ Products, IQP-379.

Calculation of the total volume of fetal erythrocytes which infiltrate maternal circulation: Scientific Subcommittee of the Australian and New Zealand Society of Blood Transfusion. Guidelines for laboratory assessment of fetomaternal haemorrhage. 1st ed. Sydney: ANZSBT, 2002: 3-12.

Supported by the grant from the Ministry of Health of the Czech Republic IGA NS 10311-3/2009

RESULTS

Fetomaternal haemorrhage (FMH) ≤ 2.5 ml (5 ml of whole blood) was present in **98.3%** cases of vaginal deliveries (908/924), and the sufficient dose of IgG anti-D was **50 µg**. FMH ≤ 5 ml (10 ml of whole blood) was seen in **99.6%** cases (920/924), and the sufficient dose of IgG anti-D was **100 µg**. In the remaining four cases, the FMH was 12.0 ml, 12.4 ml, 30.9 ml and 65.9 ml (24 ml, 25 ml, 62 ml and 132 ml of whole blood), the sufficient dose of IgG anti-D was 240 µg, 250 µg, 620 µg and 1320 µg respectively. None of the cases presented a risk factor, which could enable prediction of excessive FMH.

CONCLUSION

In vaginal deliveries where an RhD negative mother gives birth to an RhD positive child, it is appropriate to establish the volume of fetomaternal haemorrhage (FMH) in order to determine the dose of IgG anti-D necessary for the prevention of RhD alloimmunization. In 99.6 % of cases, an IgG anti-D dose of 100 µg was sufficient; contrarily, in the remaining **0.4%** of cases, there was an **excessive volume of FMH** which necessitated an IgG anti-D dose which was **several times the standard dose**. However, no risk factor which would enable prediction of excessive FMH was noted.

