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Screening of RHD fetal genotype in RhD negative women

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Objective

In all women with a first trimester screening a laboratory testing for fetal RHD status from maternal peripheral blood can be performed. The main objective of the screening is to select RhD negative pregnant women (approximately 15%, i. e. 15. 000 pregnant women in the Czech Republic) who are at risk of alloimmunization. RhD alloimmunization can develop only in pregnancies with RhD positive fetuses. In indicated cases RhD negative pregnant women should recieve anti-D immunoprophylaxis during pregnancy. These cases include potentially sensitizing events that are likely to cause a feto-maternal haemorrhage, leading to RhD alloimunization. Furthermore in RhD negative women immunoprophylaxis anti-D is routinely offered at 28 weeks of gestation and after delivery of RhD positive fetus.

Methods

At the beginning of pregnancy in RhD negative women fetal RHD genotype can be determined from free fetal DNA circulating in maternal peripheral blood. For clinical implementation non-invasive fetal RHD genotyping should be an accurate test, reliable and available to large numbers of patients.

Results

The objective is to evaluate the effectiveness of non-invasive fetal RhD genotype determination in all RhD negative women.

Conclusion

Non-invasive determination of fetal RHD genotype in all RhD negative women at the beginning of pregnancy seems to be clinically effective. It enables to select approximately 40% of pregnancies with RhD negative fetuses that do not require administration of IgG anti-D. Immunoprophylaxis anti-D should be recommended only in indicated cases as IgG anti-D is a derivative of human plasma and its production has limited resources. Furthermore it is a heterologous protein which might have certain side effects. Recombinant form of IgG anti-D is not available at the moment. Fetal RHD genotyping in all RhD negative women is not cost-effective in the Czech Republic given the relatively low price of immunoglobulin IgG anti D.