Actual management of pregnancies at risk for fetal anemia

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OBJECTIVE

To evaluate the utilisation measurements of peak systolic velocities in the middle cerebral artery (MCA-PSV) to predict the degree of fetal anemia and to find out whether implementation of MCA-PSV into management of pregnancies at risk for fetal anemia enable to reduce the number of invasive procedures.

METHODS

In 81 pregnancies at risk for fetal anemia MCA-PSV had been assessed and fetal blood sampling for measurement of hemoglobin concentration was obtained subsequently, either by cordocentesis or at delivery. The values of MCA-PSV and hemoglobin concentration were expressed as multiples of median (MoM). Anemia was defined as mild (hemoglobin <0.84 MoM for a given gestational age, moderate (hemoglobin <0.65 MoM), and severe (hemoglobin <0.55 MoM). The number of cordocentesis performed in previous conventional management of pregnacies at risk for fetal anemia was compared with management by Doppler measurement of MCA-PSV.

RESULTS

313 examination was performed at 17-38 week's gestation. An MCA-PSV >1.5 MoM detected 100% of severly anemic fetuses with a hemoglobin concentration <0,65 MoM that required invasive intervention. In 27 cases a cordocentesis was performed and intrauterine blood transfusion was given alternatively. Remaining fetuses did not require invasive intrauterine intervention and no or mild hemolytic anemia and hyperbilirubinemia were diagnosed after delivery. Overall sensitivity to detect moderate to severe anemia (hemoglobin <0.65 MoM for a given gestational age) was 100%. Specificity was 92%, positive predictive value was 60% and negative predictive value was 100%. One false positive case was identified after 35 weeks.

In 2002 at least one cordocentesis was performed in all pregnancies at risk for fetal anemia 100%, in 2003 78%, in 2004 20% and in 2005 20%. At least one cordocentesis with intrauterine blood transfusion was required by only 24% of all fetuses at risk for fetal anemia. The other fetuses 76% (34/45) didn't require intrauterine transfusion.

CONCLUSION

Middle cerebral artery peak systolic velocity is a highly sensitive non-invasive means for determining the degree of fetal anemia and implementation of MCA-PSV into management of pregnancies at risk for fetal anemia enable to reduce the number of invasive procedures. This parameter should not yet be considered the global standard of care for diagnosis of fetal anemia because incorrect use by an unexperienced operator may cause more harm than good. However, if there is a reasonably close medical center with sonographers tranined to assess the MCA-PSV, patients at risk for fetal anemia should be reffered to this center.

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Maternal hemolytic antibodies identified in study patients

Antibody	n	Antibody	n
Rh D	17	Kell	6
Rh C	2	ABO	30
Rh DC	7	M	1
Rh DC^{w}	7		
Rh DCE	1		
Rh CC^{w}	1		
Rh C^{w}	1		
Rh CE	2		
Rh E	2		

Cytomegalovirus infection	2
Parvovirus B19 infection	2
Diamond-Blackfan anemia	1