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### Background

Fetal anemia due to red-cell allo-immunization is rare before 20 weeks' gestation. Its management may be challenging because of technical difficulties in diagnosing fetal anemia and in performing an intravascular fetal transfusion.

### Aims

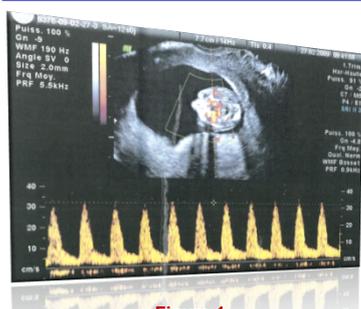
- 1) To describe the feasibility and the prognosis of very early in-utero transfusions before 20 weeks, in particular in cases where intravascular transfusion is not possible.
- 2) To assess the predictive value of middle cerebral artery peak systolic velocity (MCA-PSV) for the diagnosis of fetal anemia before 20 weeks.

### Subjects and Methods

We assessed retrospectively all intra-uterine transfusions performed for red-cell allo-immunisation before 20 weeks in our institution since 1990. The diagnosis of fetal anemia was mainly based on middle cerebral artery peak systolic velocity (MCA-PSV) since 2003. Intravascular fetal transfusion was performed when technically possible and intraperitoneal transfusion was performed otherwise.

### Résultats

We performed 18 in-utero transfusions (IUTs) before 20 weeks in 13 women. Measurement of MCA-PSV was possible in all attempted cases and was accurate in the diagnosis of fetal anemia before 20 weeks. Intravascular IUT was possible in 15 cases out of 17 attempts, as early as 17 weeks. One fetal death occurred after a failed attempt of intravascular IUT at 18 weeks. Intraperitoneal route was chosen in 3 cases, once because intravascular access was deemed impossible and twice because of failed intravascular transfusion. No improvement in MCA-PSV was observed after intraperitoneal transfusions and all 3 fetuses remained severely anemic at the time of the first possible intravascular IUT. We obtained 12 live births out of 13 pregnancies at a mean gestational age of 36 weeks.



**Figure 1**  
MCA-PSV  
12 weeks



**Figure 2**  
Fetal ascites  
19<sup>+</sup>4 weeks

	Group managed without MCA-PSV (n=8 ; 9 IUT)	Group managed with MCA-PSV (n=5 ; 9 IUT)
<b>Getational age at IUT</b>	19 weeks + 3 days	18 weeks + 3 days *
<b>Fetal hemoglobin before 1<sup>st</sup> IUT</b>	7,4 +/- 1,1 g/dl	4,6 +/- 2,4 g/dl *
<b>Fetal haemoglobin after 1<sup>st</sup> IUT</b>	14,5 +/- 2,0 g/dl	11,7 +/- 1,1 g/dl *
<b>Gestational age at delivery</b>	35 weeks + 6 days	34 weeks + 1 day

**Table 1**  
Comparison of the groups according the use of MCA-PSV (after 2003) or not (before 2003) in the diagnosis of fetal anemia

**Table 2**  
Characteristics of the patients who required IUT ≤ 20 weeks

IC : intra vascular  
IP : intra peritoneal  
LB : live birth

	Group managed without MCA-PSV (before 2003)								Group managed with MCA-PSV (after 2003)				
	18 w	19 w + 3 d	20 w	19 w + 6 d	19 w	20 w	19 w + 4 d	20 w	17 w + 3 d	17 w + 3 d	19 w + 5 d	19 w + 5 d	17 w + 2 d
<b>Gestationnel age in the first IUT</b>													
<b>Number of IUT &lt; 20 weeks</b>	2	1	1	1	1	1	1	1	1	2	1	1	4
<b>Ultrasound signs of fetal anemia</b>	+	+	+	+	+	+	+	+	+	-	+	-	+
<b>Modalities of the first transfusion</b>	IV	IV	IV	IV	IV	IV	IV	IV	IP	IV	IV	IV	IP
<b>Pronostic</b>	LB	LB	LB	LB	LB	LB	LB	LB	Fetal death	LB	LB	LB	LB
<b>Term of delivery</b>	35 <sup>+3</sup> w	37 w	36 <sup>+1</sup> w	38 <sup>+2</sup> w	Not known	Not known	36 w	32 <sup>+2</sup> w	18 w	37 <sup>+1</sup> w	37 w	36 <sup>+3</sup> w	36 <sup>+5</sup> w

### Conclusion

MCA-PSV is reliable in the diagnosis of fetal anemia before 20 weeks. When technically feasible, intravascular IUT is the best therapeutic choice. Intraperitoneal transfusion is possible at very early stages but its efficacy remains limited at such early stages of pregnancy.