Prediction of outcome in twin pregnancy with first and second trimester ultrasound

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Objective: To establish if first or second trimester biometry (11+0 to 21+6 weeks) is a useful adjunct in the prediction of adverse perinatal outcomes in twin pregnancy.

Study Design: A consecutive cohort of 1028 unselected twin pregnancies were enrolled for the Evaluation of Sonographic Predictors of Restricted growth in Twins (ESPRiT) study, a multicenter prospective study conducted at 8 academic perinatal centers in Ireland. Complete outcome data was recorded for 1001 twin pairs that completed the study {200 monochorionic (MC) and 801 dichorionic (DC)}. Biometric data obtained between 11 and 22 weeks were evaluated as predictors of a composite of adverse perinatal outcome (mortality, hypoxic ischemic encephalopathy, periventricular leukomalacia, necrotizing enterocolitis, respiratory distress, or sepsis), preterm delivery (PTD), birthweight discordance greater than 18% (18% BW) Outcomes were adjusted for chorionicity and gestational age using Cox Proportional Hazards regression.

Results: Differences in CRL of 10% or 20% were not predictive of adverse perinatal outcome in either DC or MC twins.

Between 14 and 22 weeks, an abdominal circumference (AC) difference of more than 10% was the most useful predictor for adverse perinatal outcome, PTD and 18% or more BW discordance in both DC and MC twins. The strongest correlation was observed for biometry obtained between 18 and 22 weeks (Table).

Conclusion:
While first trimester biometry was not useful for predicting adverse outcome, biometry in the early second trimester can successfully identify twin pregnancies at increased risk of poor perinatal outcome. Intertwin AC difference of greater than 10% between 14 and 22 weeks gestation was the best individual predictor of perinatal risk in both monochorionic and dichorionic twins. Sonographic biometry in the early second trimester should therefore be utilized to establish perinatal risk, thus allowing prenatal care to be tailored accordingly.

Parameter & Gestational Age	**Twin Difference**	**All Twins**			**DC twins**			**MC twins**		
		CO#	18% BW	PTD	CO#	18% BW	PTD	CO#	18% BW	PTD
CRL from 11+0 to 14+0 weeks	**≥ 20%**	50%	50%	50%	50%	50%	50%	0%	0%	0%
	< 20%	13%	18%	13%	12%	18%	11%	20%	20%	24%
	HR 95% CI	0.2 -1.8	0.4-2.2	0.4-2.4	0.3-3.1	0.4-2.4	0.5-4.3	NE	0.2-4.5	0.1-3.0
AC from 14+1 to 17+6 weeks	**≥ 10%**	31%	42%	37%	22%	45%	28%	44%	52%	52%
	< 10%	22%	22%	17%	18%	22%	12%	32%	20%	26%
	HR 95% CI	1.0-2.5	**1.6-3.8*** **	**1.5-3.8*** **	0.7-2.9	**1.1-3.4***	**1.2-4.8***	0.9-3.2	1.9-7.2***	1.2-4.4**
AC from 18+0 to 21+6 weeks	**≥ 10%**	45%	43%	37%	34%	38%	20%	61%	50%	61%
	< 10%	22%	20%	16%	19%	19%	14%	31%	21%	23%
	HR 95% CI	**1.7-3.2*** **	**2.1-4.1*** **	**1.7-3.4*** **	**1.2-2.8****	**1.4-3.3*** **	**0.8-2.6**	**2.0-4.9 *** **	**2.9-8.2*** **	**2.2-5.7*** **

Abbrevations: CO=Composite Outcome, BW= Birthweight discordance, PTD=Pre-term delivery, HR=Hazard Ratio, NE=Non-estimable

Composite outcome defined as any: Death, IVH, HIE, PVL, NEC, RDS or Sepsis

* P-value < 0.05, ** P-value < 0.01, *** P-value < 0.001