



First Trimester Markers of Preeclampsia in Twins: Maternal Mean Arterial Pressure and Uterine Artery Doppler Pulsatility Index



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Objectives

This study aims to evaluate the distribution of *mean arterial pressure (MAP)* and uterine artery Doppler *pulsatility index (PI)* in first trimester twins with and without preeclampsia.

Methods

A total of 147 twins were recruited from a specialist clinic and 110 unaffected singleton pregnancies attending the same institution served as controls. MAP and Doppler PI values were expressed in multiples of the gestationspecific median using published equations.

Results

Among the twins, 12 had preeclampsia and two had pregnancy-induced hypertension. Among unaffected pregnancies, there was no significant difference in MAP levels between twins and singletons ($P = 0.17$, Wilcoxon rank sum test, two-tail). However, the Doppler PI levels were highly statistically significantly lower than in singletons ($P < 0.0005$). MAP was unrelated to chorionicity ($P = 0.46$), but there was a statistically significant increase in Doppler PI among mono chorionic compared with dichorionic twins ($P < 0.01$) (Table 1). In twins with preeclampsia, MAP was significantly higher than in unaffected twins ($P < 0.02$, one-tail), whereas Doppler PI levels were significantly reduced ($P < 0.01$, two-tail) (Table 2).

Table 1. MAP and Doppler PI distributions in unaffected twin and singleton pregnancies*

	Cases	Median (MoM)	SD (log ₁₀ MoM)
MAP			
Twins-All	124	0.981	0.0383
-DC	106	0.977	0.0361
-MC	17	0.999	0.0594
-ART	62	0.979	0.0350
-not	61	0.983	0.0415
Singletons	94	0.957	0.0355
Doppler PI			
Twins-All	121	0.935	0.120
-DC	105	0.910	0.120
-MC	15	1.201	0.097
-ART	61	0.910	0.122
-not	59	0.948	0.129
Singletons	92	1.042	0.125

*Correlation coefficient between log MoMs for MAP and Doppler PI: twins -0.12 ($P = 0.18$, 2-tail) and singletons -0.40 ($P < 0.0001$)

Table 2. Individual MAP and Doppler PI values in affected twins

Case	MAP (MoM)	Dopler PI (MoM)	Delivery (Week)	Chorionicity
Pre-eclampsia				
1	1.134	0.469	29	DC
2	1.129	0.606	35	DC
3	1.113	0.995	30	DC
4	1.102	0.580	35	DC
5	1.074	0.680	34	DC
6	1.064	0.788	36	DC
7	1.060	0.518	34	DC
8	1.034	0.864	37	DC
9	1.004	1.499	26	DC
10	0.973	-	36	DC
11	0.901	0.887	36	DC
12	0.868	0.480	37	DC
Pregnancy-induced hypertension				
1	1.000	1.016	34	DC
2	0.997	0.675	35	DC

Conclusions

if first trimester screening for preeclampsia is extended to twins, a different normal median Doppler PI equation will be needed. Contrary to expectations, Doppler PI levels may not be raised in affected twins, although this needs confirmation in a larger study.