



Comparative analysis of carotid hemodynamics during second trimester in pregestational diabetic and non-diabetic pregnancies

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Introduction

Maternal hemodynamic adaptation is most prominent during the second trimester of pregnancy. We investigated maternal hemodynamic changes during the second trimester using carotid ultrasonography and Doppler ultrasound in women with diabetes mellitus and compared with non-diabetic pregnancies.

Method

- ▶ Excluded multifetal pregnancies, fetal anomalies, or chronic medical disorders
- ▶ Ultrasound data obtained at 20–24 weeks of gestation
- ▶ Adjusted chronic hypertension, maternal age, pre-pregnancy body mass index, parity, and gestational age at measurement.

Result

	No overt DM (n=67)	Overt DM (n=10)	Unadjusted P	Adjusted P
MCA EDV, cm/s	5.22±1.55	5.11±2.67	0.940	0.862
MCA S/D	8.32±27.57	3.56±1.26	0.213	0.525
MCA PI	1.46±0.26	4.51±9.70	0.832	0.002
MCA RI	0.71±0.12	1.36±1.99	0.553	0.002
UA EDV, cm/s	9.21±2.37	7.79±3.77	0.174	0.075
UA S/D	3.64±0.80	3.72±1.93	0.887	0.861
UA PI	1.18±0.18	5.73±14.35	0.365	0.002
UA RI	0.68±0.0	2.13±4.66	0.967	0.002

Table 1. Fetal non-carotid artery parameters according to Overt DM

	No overt DM (n=84)	Overt DM (n=19)	Unadjusted P	Adjusted P
CCA IMT, cm	0.04±0.01	0.04±0.01	0.514	0.134
CCA PSV, cm/s	85.88±17.07	68.86±10.87	<0.001	0.003
CCA EDV, cm/s	19.06±4.03	16.74±3.86	0.139	0.034
ICA IMT, cm	0.04±0.01	0.04±0.01	0.793	0.993
ICA PSV, cm/s	68.78±15.47	61.85±17.73	0.282	0.145
ICA EDV, cm/s	22.86±6.64	21.16±4.29	0.502	0.265
ECA IMT, cm	0.03±0.01	0.03±0.01	0.034	0.082
ECA PSV, cm/s	73.23±17.46	72.19±18.27	0.949	0.517
ECA EDV, cm/s	12.06±4.41	13.39±5.57	0.204	0.564

Table 2. Maternal carotid artery parameters according to Overt DM

Conclusion

Pregestational DM was independently associated with **altered maternal carotid hemodynamics during the second trimester**, characterized by lower CCA blood flow velocities, suggesting **impaired maternal vascular function**. Pregestational DM was also associated with increased fetal MCA and UA PI and RI, indicating **altered fetal cerebral and fetoplacental hemodynamics**. **Carotid Doppler parameters may serve as useful noninvasive markers for early detection of vascular impairment** in this population.