

METHODS: Pregnant women enrolled in the Pregnancy Outcomes and Community Health Study (1998-2004) provided a non-fasting venous blood sample at 15-27 weeks gestation. Lipids (TC, high-density lipoprotein (HDLc), low-density lipoprotein (LDLc) cholesterol, and TG) were measured in a subcohort (n=1309). The midrange of lipid levels (25-75th %tile) was designated as referent. Gender and gestational age-specific birth weight z-scores (BWz) were calculated. Women recalled pregnancy LTPA (any= Active, none= Inactive) at follow-up in 2007 (n=722). Linear regression was used to examine associations among lipids (Low, Referent, High) and BWz within pregnancy LTPA groups. Final models were adjusted for race, pre-pregnancy BMI, maternal age, gestational weight gain, and gestational age at time of blood draw.

RESULTS: Comparisons between the Active (n=363) and Inactive (n=359) groups showed that the Active group had significantly lower mean TC (223, 95%CI: 218-228 mg/dl vs. 236, 230-242 mg/dl), LDLc (119, 115-123 mg/dl vs. 129, 124-134 mg/dl), and TG (179, 171-187 mg/dl vs. 196, 185-207 mg/dl) (p <0.05). In adjusted analyses among the Active group, lipid levels were not associated with BWz. Among inactive women, Low HDLc (beta=-0.4, 95%CI: -0.7, -0.01) and Low LDLc (beta= -0.4, 95% CI: -0.7, -0.1) were associated with significantly lower BWz, and High TG was associated with higher BWz (beta=0.2, 95%CI: 0.1, 0.6). After excluding cases of gestational hypertension or diabetes (n=52 for active and n= 74 for inactive women), results remained the same for the Active group, and relations were strengthened in the Inactive group.

CONCLUSION: Our results offer preliminary support that LTPA during pregnancy may disrupt associations between maternal lipids and birth weight.

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The Effect of Pregnancy on Ground Reaction Forces during Stair Locomotion

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Pregnant women are at a high risk of falling. To our knowledge, ground reaction forces (GRFs) during stair locomotion have not been reported for pregnant women.

PURPOSE: To examine the effects of advancing pregnancy on GRFs during stair locomotion.

METHODS: Data were collected on 41 pregnant women in the mid 2nd and 3rd trimesters, and on 40 control women. Subjects walked at their freely chosen walking speeds during ascent and descent. A force plate imbedded in the second stair, but structurally independent of the staircase, was used to collect GRF data (1080 Hz). Three trials were collected from each subject. GRF variables were normalized to body mass. A two-factor ANOVA (trimester x subject) was performed on each of these vertical GRF variables: passive peak, time to passive peak, loading rate, min between peaks, time to min between peaks, active peak, time to active peak, and impulse. A second ANOVA was performed on each of these shear GRF variables: max braking force, time to max braking force, braking impulse, max propulsive force, time to max propulsive force, propulsive impulse, medial impulse and lateral impulse. (Bonferroni-corrected $\alpha = 0.006$). Tukey post-hoc tests were performed when appropriate.

RESULTS: Differences in GRFs between pregnant women in their 2nd and 3rd trimesters and control women were noted for both ascent and descent (Table 1).

CONCLUSIONS: Pregnant women demonstrated GRF alterations that may be related to a slower walking velocity or increased instability. In particular, the increase in the medial impulse during pregnancy may be related to 'waddling' and changes in frontal plane control. *Funding: NIOSH K01 008458.

Table 1: GRF variables which were different between pregnant women and controls.

		Control	2nd Trimest.	3rd Trimest.	p-value	Post-hoc
Ascent	Medial Impulse (BW s)	0.022±0.013	0.032±0.015	0.036±0.015	0.001	3rd >2nd>C
	Passive Peak (BW)	1.11±0.14	1.04±0.10	1.02±0.82	0.003	C>2nd,3rd
	Loading Rate (BW/s)	5.68±1.51	4.41±0.90	4.16±1.12	0.001	C>2nd,3rd
	Vertical Impulse (BW s)	0.537±0.072	0.590±0.078	0.604±0.079	0.001	3rd >2nd>C
Descent	Vertical Impulse (BW s)	0.480±0.070	0.507±0.062	0.530±0.076	0.001	3rd >2nd>C

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Sympathetic Baroreflex Sensitivity is Not Altered from Pre- to Early Pregnancy in Healthy Humans

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Anecdotally, many women during early pregnancy report symptoms of presyncope when moving from supine to standing. During early pregnancy many hormonal and hemodynamic changes occur that can lead to a decrease in orthostatic tolerance. It is unclear how the baroreflex is altered during the early stages of pregnancy.

PURPOSE: To determine whether sympathetic baroreflex sensitivity (BRS) decreases from pre-pregnancy to early pregnancy.

METHODS: Five healthy young women were tested twice, once during pre-pregnancy (mid-luteal phase) and once during early pregnancy (4-8 weeks gestation). Heart rate (HR), blood pressure (systolic, SBP; diastolic, DBP), and muscle sympathetic nerve activity (MSNA) were measured during supine baseline, 30° and 60° head-up tilt (HUT), and supine recovery. Sympathetic BRS was determined from the spontaneous changes in beat-by-beat DBP and corresponding MSNA.