

## SUPPLEMENTARY MATERIAL

### Supplementary Tables

**Supplementary Table 1. Additional characteristics of study participants.**

Characteristics	Male	Female	<i>p</i>
Clinical site, n (%)			
Columbia University	26 (17.1%)	27 (18.1%)	0.70 <sup>1</sup>
Christina Care Health Systems	25 (16.4%)	27 (18.1%)	
Saint Peters University Hospital	26 (17.1%)	29 (19.5%)	
Medical University of South Carolina	14 (9.2%)	17 (11.4%)	
Northwestern University	11 (7.2%)	10 (6.7%)	
University of California Irvine	3 (2.0%)	2 (1.3%)	
Long Beach Memorial Medical Center	24 (15.8%)	17 (11.4%)	
New York Hospital Queens	8 (5.3%)	8 (5.4%)	
University of Alabama at Birmingham	6 (3.9%)	10 (6.7%)	
Fountain Valley Hospital	6 (3.9%)	1 (0.7%)	
Women and Infants Hospital of Rhode Island	3 (2.0%)	1 (0.7%)	
Parity, n (%)			
0	72 (47.4%)	68 (45.6%)	0.92 <sup>1</sup>
1	56 (36.8%)	52 (34.9%)	
2	18 (11.8%)	23 (15.4%)	
3	5 (3.3%)	5 (3.4%)	
≥4	1 (0.7%)	1 (0.7%)	
Maternal education, n (%)			
Less than high school	16 (10.5%)	21 (14.1%)	0.48 <sup>2</sup>
High school diploma or GED or equivalent	29 (19.1%)	27 (18.1%)	
Some college or Associate degree	42 (27.6%)	44 (29.5%)	
Bachelors' degree	41 (27.0%)	33 (22.1%)	
Masters' degree or Advanced degree	24 (15.8%)	24 (16.1%)	
Maternal age in years, median (Q1-Q3)	28.00 (23.50-31.50)	28.00 (23.00-32.00)	1.00 <sup>2</sup>
Gestational age at delivery in weeks, median (Q1-Q3)	39.43 (38.71-40.14)	39.71 (39.00-40.29)	0.16 <sup>2</sup>
Trimmed placental weight in g, median (Q1-Q3)	425.00 (355.00-488.00)	416.00 (365.00-489.00)	0.54 <sup>2</sup>
Placental disc length in cm, median (Q1-Q3)	20.00 (18.00-21.50)	20.50 (19.00-22.00)	0.05 <sup>2</sup>
Placental disc width in cm, median (Q1-Q3)	17.00 (15.25-19.00)	17.00 (15.00-18.00)	0.32 <sup>2</sup>
Placental disc thickness in cm, median (Q1-Q3)	2.00 (1.40-2.50)	2.00 (1.30-2.35)	0.45 <sup>2</sup>
Placental maternal surface fibrin deposit, n (%)			
Absent	104 (69.3%)	111 (76.6%)	0.16 <sup>2</sup>
Present	46 (30.7%)	34 (23.4%)	
Placental maternal surface calcification, n (%)			
Absent	108 (71.1%)	87 (58.8%)	0.05 <sup>2</sup>
Present (Focal)	15 (9.9%)	27 (18.2%)	
Present (Diffuse)	29 (19.1%)	34 (23.0%)	

<sup>1</sup> based on Fisher's exact test; <sup>2</sup> based on Mann-Whitney test; Q1, 1st quartile value; Q3, 3rd quartile value

**Supplementary Table 2. Change in fetal weight z-score at 13-40 weeks gestation per one week increase in placental age acceleration in male and female fetuses.**

Gestational week	Male				Female			
	Beta	95% CI		p	Beta	95% CI		p
		Lower	Upper			Lower	Upper	
13	0.047	-0.062	0.157	0.40	0.172	0.082	0.261	<b>0.000261</b>
14	0.040	-0.069	0.149	0.48	0.170	0.081	0.259	<b>0.000281</b>
15	0.032	-0.077	0.142	0.56	0.168	0.080	0.257	<b>0.000308</b>
16	0.025	-0.085	0.134	0.66	0.166	0.078	0.255	<b>0.000345</b>
17	0.017	-0.093	0.126	0.76	0.164	0.076	0.253	<b>0.000394</b>
18	0.009	-0.100	0.119	0.87	0.162	0.074	0.250	<b>0.00046</b>
19	0.001	-0.108	0.111	0.98	0.159	0.071	0.247	<b>0.000547</b>
20	-0.007	-0.116	0.103	0.90	0.156	0.069	0.244	<b>0.000664</b>
21	-0.015	-0.124	0.095	0.79	0.153	0.066	0.241	<b>0.000822</b>
22	-0.023	-0.133	0.087	0.68	0.150	0.063	0.238	<b>0.001037</b>
23	-0.031	-0.141	0.079	0.58	0.147	0.059	0.234	<b>0.001332</b>
24	-0.039	-0.149	0.071	0.49	0.143	0.055	0.230	<b>0.001738</b>
25	-0.047	-0.157	0.062	0.40	0.139	0.051	0.226	<b>0.002302</b>
26	-0.055	-0.165	0.054	0.33	0.135	0.047	0.222	<b>0.003089</b>
27	-0.063	-0.173	0.046	0.26	0.130	0.043	0.218	<b>0.004193</b>
28	-0.071	-0.181	0.038	0.20	0.126	0.038	0.213	<b>0.005744</b>
29	-0.079	-0.188	0.030	0.16	0.121	0.033	0.209	<b>0.007925</b>
30	-0.087	-0.196	0.022	0.12	0.116	0.028	0.204	<b>0.010985</b>
31	-0.095	-0.204	0.015	0.09	0.111	0.023	0.199	<b>0.01526</b>
32	-0.102	-0.211	0.007	0.07	0.105	0.017	0.194	<b>0.021195</b>
33	-0.110	-0.219	-0.001	0.05	0.100	0.011	0.189	<b>0.029361</b>
34	-0.117	-0.226	-0.008	<b>0.037084</b>	0.094	0.005	0.183	<b>0.040468</b>
35	-0.124	-0.233	-0.015	<b>0.026975</b>	0.088	-0.001	0.178	0.06
36	-0.131	-0.240	-0.023	<b>0.019527</b>	0.082	-0.008	0.172	0.08
37	-0.138	-0.246	-0.029	<b>0.014098</b>	0.076	-0.014	0.167	0.10
38	-0.144	-0.252	-0.036	<b>0.010178</b>	0.070	-0.021	0.161	0.13
39	-0.150	-0.258	-0.042	<b>0.007366</b>	0.064	-0.028	0.155	0.17
40	-0.156	-0.264	-0.048	<b>0.005359</b>	0.057	-0.034	0.149	0.22

Adjusted for maternal age, pre-pregnancy body mass index, race/ethnicity, marital status, educational status, health insurance ownership, parity, and mode of onset of labor. Statistically significant associations ( $p < 0.05$ ) are marked in bold.

**Supplementary Table 3. Change in head circumference z-score at 13-40 weeks gestation per one week increase in placental age acceleration in male and female fetuses.**

Gestational week	Male				Female			
	Beta	95% CI		<i>p</i>	Beta	95% CI		<i>p</i>
		Lower	Upper			Lower	Upper	
13	0.073	-0.038	0.184	0.20	0.194	0.109	0.280	<b>1.87E-05</b>
14	0.070	-0.041	0.181	0.22	0.195	0.109	0.280	<b>1.76E-05</b>
15	0.068	-0.043	0.179	0.23	0.195	0.110	0.280	<b>1.67E-05</b>
16	0.065	-0.046	0.175	0.25	0.195	0.110	0.280	<b>1.6E-05</b>
17	0.061	-0.049	0.172	0.28	0.195	0.110	0.280	<b>1.56E-05</b>
18	0.057	-0.053	0.167	0.31	0.195	0.110	0.280	<b>1.56E-05</b>
19	0.053	-0.057	0.163	0.35	0.195	0.110	0.280	<b>1.6E-05</b>
20	0.047	-0.062	0.157	0.40	0.195	0.109	0.280	<b>1.72E-05</b>
21	0.042	-0.068	0.151	0.46	0.194	0.108	0.279	<b>1.95E-05</b>
22	0.035	-0.074	0.144	0.53	0.192	0.106	0.278	<b>2.38E-05</b>
23	0.028	-0.081	0.136	0.62	0.190	0.104	0.276	<b>3.14E-05</b>
24	0.019	-0.088	0.127	0.72	0.187	0.100	0.274	<b>4.58E-05</b>
25	0.010	-0.097	0.117	0.85	0.183	0.096	0.271	<b>7.4E-05</b>
26	0.000	-0.106	0.107	0.99	0.178	0.090	0.267	<b>0.000133</b>
27	-0.010	-0.116	0.096	0.85	0.172	0.082	0.261	<b>0.000262</b>
28	-0.021	-0.126	0.084	0.70	0.164	0.073	0.255	<b>0.000553</b>
29	-0.032	-0.137	0.073	0.55	0.156	0.063	0.248	<b>0.001219</b>
30	-0.043	-0.147	0.062	0.43	0.146	0.053	0.239	<b>0.002694</b>
31	-0.053	-0.157	0.051	0.32	0.136	0.041	0.230	<b>0.005771</b>
32	-0.063	-0.167	0.042	0.24	0.125	0.029	0.221	<b>0.011652</b>
33	-0.071	-0.176	0.033	0.18	0.115	0.018	0.211	<b>0.021754</b>
34	-0.079	-0.183	0.026	0.14	0.105	0.007	0.202	<b>0.037221</b>
35	-0.085	-0.190	0.020	0.11	0.096	-0.002	0.194	0.06
36	-0.091	-0.196	0.015	0.09	0.088	-0.011	0.186	0.08
37	-0.095	-0.200	0.011	0.08	0.081	-0.018	0.180	0.11
38	-0.098	-0.204	0.007	0.07	0.075	-0.024	0.175	0.14
39	-0.101	-0.206	0.005	0.07	0.071	-0.029	0.171	0.16
40	-0.102	-0.208	0.004	0.06	0.068	-0.032	0.168	0.18

Adjusted for maternal age, pre-pregnancy body mass index, race/ethnicity, marital status, educational status, health insurance ownership, parity, and mode of onset of labor. Statistically significant associations ( $p < 0.05$ ) are marked in bold.

**Supplementary Table 4. Change in biparietal diameter z-score at 13-40 weeks gestation per one week increase in placental age acceleration in male and female fetuses.**

Gestational week	Male				Female			
	Beta	95% CI		<i>p</i>	Beta	95% CI		<i>p</i>
		Lower	Upper			Lower	Upper	
13	0.075	-0.038	0.188	0.20	0.187	0.101	0.274	<b>4.26E-05</b>
14	0.070	-0.043	0.183	0.22	0.189	0.102	0.275	<b>3.67E-05</b>
15	0.064	-0.049	0.178	0.27	0.190	0.104	0.277	<b>3.18E-05</b>
16	0.058	-0.055	0.171	0.32	0.192	0.105	0.278	<b>2.76E-05</b>
17	0.051	-0.062	0.164	0.38	0.193	0.107	0.279	<b>2.43E-05</b>
18	0.044	-0.069	0.157	0.45	0.194	0.108	0.281	<b>2.16E-05</b>
19	0.036	-0.077	0.149	0.54	0.195	0.109	0.282	<b>1.97E-05</b>
20	0.027	-0.086	0.140	0.64	0.196	0.110	0.283	<b>1.85E-05</b>
21	0.017	-0.095	0.130	0.76	0.197	0.110	0.283	<b>1.81E-05</b>
22	0.007	-0.106	0.120	0.90	0.197	0.110	0.284	<b>1.85E-05</b>
23	-0.004	-0.117	0.108	0.94	0.197	0.110	0.284	<b>2.01E-05</b>
24	-0.016	-0.128	0.096	0.78	0.196	0.109	0.283	<b>2.32E-05</b>
25	-0.029	-0.141	0.083	0.62	0.194	0.107	0.282	<b>2.89E-05</b>
26	-0.042	-0.153	0.070	0.47	0.192	0.104	0.280	<b>3.89E-05</b>
27	-0.055	-0.167	0.056	0.33	0.189	0.100	0.278	<b>5.64E-05</b>
28	-0.069	-0.180	0.042	0.23	0.185	0.096	0.274	<b>8.77E-05</b>
29	-0.083	-0.193	0.028	0.15	0.180	0.090	0.270	<b>0.000145</b>
30	-0.096	-0.206	0.015	0.09	0.174	0.084	0.265	<b>0.00025</b>
31	-0.109	-0.219	0.002	0.06	0.168	0.077	0.259	<b>0.000445</b>
32	-0.121	-0.231	-0.011	<b>0.033642</b>	0.161	0.069	0.253	<b>0.000799</b>
33	-0.132	-0.242	-0.022	<b>0.020309</b>	0.154	0.061	0.246	<b>0.001423</b>
34	-0.142	-0.253	-0.032	<b>0.012475</b>	0.146	0.053	0.239	<b>0.002474</b>
35	-0.152	-0.262	-0.042	<b>0.007889</b>	0.139	0.046	0.232	<b>0.004154</b>
36	-0.160	-0.270	-0.050	<b>0.005178</b>	0.132	0.038	0.225	<b>0.006676</b>
37	-0.167	-0.277	-0.057	<b>0.003547</b>	0.125	0.031	0.218	<b>0.010216</b>
38	-0.173	-0.284	-0.063	<b>0.002542</b>	0.118	0.024	0.212	<b>0.014846</b>
39	-0.179	-0.289	-0.068	<b>0.001905</b>	0.113	0.019	0.207	<b>0.020478</b>
40	-0.183	-0.294	-0.073	<b>0.001493</b>	0.108	0.013	0.202	<b>0.026827</b>

Adjusted for maternal age, pre-pregnancy body mass index, race/ethnicity, marital status, educational status, health insurance ownership, parity, and mode of onset of labor. Statistically significant associations ( $p < 0.05$ ) are marked in bold.

**Supplementary Table 5. Change in abdominal circumference z-score at 13-40 weeks gestation per one week increase in placental age acceleration in male and female fetuses.**

Gestational week	Male				Female			
	Beta	95% CI		<i>p</i>	Beta	95% CI		<i>p</i>
		Lower	Upper			Lower	Upper	
13	0.051	-0.061	0.163	0.38	0.170	0.082	0.258	<b>0.000245</b>
14	0.046	-0.066	0.158	0.43	0.169	0.081	0.257	<b>0.000246</b>
15	0.040	-0.072	0.152	0.48	0.169	0.081	0.256	<b>0.000249</b>
16	0.034	-0.078	0.146	0.55	0.168	0.081	0.256	<b>0.000257</b>
17	0.028	-0.084	0.139	0.63	0.167	0.080	0.255	<b>0.000272</b>
18	0.021	-0.091	0.132	0.72	0.166	0.079	0.253	<b>0.000294</b>
19	0.013	-0.098	0.124	0.82	0.164	0.077	0.252	<b>0.000327</b>
20	0.005	-0.106	0.116	0.93	0.163	0.075	0.250	<b>0.000377</b>
21	-0.004	-0.114	0.107	0.95	0.160	0.073	0.247	<b>0.000451</b>
22	-0.012	-0.122	0.097	0.82	0.158	0.070	0.245	<b>0.000562</b>
23	-0.022	-0.131	0.088	0.70	0.154	0.067	0.242	<b>0.000729</b>
24	-0.031	-0.140	0.078	0.57	0.151	0.063	0.238	<b>0.000985</b>
25	-0.041	-0.150	0.067	0.46	0.146	0.059	0.234	<b>0.00138</b>
26	-0.051	-0.159	0.057	0.36	0.142	0.054	0.229	<b>0.001995</b>
27	-0.060	-0.168	0.047	0.27	0.136	0.048	0.225	<b>0.002951</b>
28	-0.070	-0.177	0.037	0.20	0.131	0.042	0.219	<b>0.004425</b>
29	-0.079	-0.185	0.028	0.15	0.125	0.036	0.214	<b>0.006654</b>
30	-0.087	-0.194	0.019	0.11	0.119	0.030	0.208	<b>0.009936</b>
31	-0.095	-0.201	0.011	0.08	0.113	0.024	0.203	<b>0.014598</b>
32	-0.102	-0.208	0.003	0.06	0.107	0.017	0.197	<b>0.020948</b>
33	-0.109	-0.214	-0.003	<b>0.04518</b>	0.102	0.011	0.192	<b>0.029203</b>
34	-0.114	-0.219	-0.009	<b>0.034911</b>	0.096	0.006	0.187	<b>0.039419</b>
35	-0.119	-0.224	-0.014	<b>0.027715</b>	0.091	0.000	0.182	0.05
36	-0.123	-0.228	-0.019	<b>0.022662</b>	0.087	-0.005	0.178	0.06
37	-0.127	-0.232	-0.022	<b>0.019113</b>	0.083	-0.009	0.174	0.08
38	-0.130	-0.234	-0.025	<b>0.016629</b>	0.079	-0.013	0.171	0.09
39	-0.132	-0.236	-0.027	<b>0.014917</b>	0.076	-0.016	0.168	0.11
40	-0.133	-0.238	-0.029	<b>0.013783</b>	0.073	-0.018	0.165	0.12

Adjusted for maternal age, pre-pregnancy body mass index, race/ethnicity, marital status, educational status, health insurance ownership, parity, and mode of onset of labor. Statistically significant associations ( $p < 0.05$ ) are marked in bold.

**Supplementary Table 6. Change in humeral length z-score at 13-40 weeks gestation per one week increase in placental age acceleration in male and female fetuses.**

Gestational week	Male				Female			
	Beta	95% CI		<i>p</i>	Beta	95% CI		<i>p</i>
		Lower	Upper			Lower	Upper	
13	0.054	-0.056	0.164	0.34	0.197	0.108	0.285	<b>2.75E-05</b>
14	0.053	-0.056	0.163	0.34	0.196	0.107	0.284	<b>2.97E-05</b>
15	0.052	-0.058	0.162	0.35	0.194	0.106	0.283	<b>3.27E-05</b>
16	0.051	-0.059	0.160	0.37	0.193	0.105	0.281	<b>3.69E-05</b>
17	0.049	-0.061	0.159	0.38	0.191	0.103	0.279	<b>4.26E-05</b>
18	0.047	-0.063	0.157	0.40	0.189	0.101	0.277	<b>5.1E-05</b>
19	0.045	-0.065	0.154	0.43	0.186	0.098	0.274	<b>6.36E-05</b>
20	0.042	-0.068	0.151	0.46	0.183	0.095	0.270	<b>8.34E-05</b>
21	0.038	-0.072	0.147	0.50	0.178	0.091	0.266	<b>0.000117</b>
22	0.033	-0.076	0.142	0.55	0.173	0.085	0.261	<b>0.000177</b>
23	0.028	-0.081	0.137	0.62	0.166	0.079	0.254	<b>0.000297</b>
24	0.021	-0.088	0.130	0.71	0.158	0.071	0.245	<b>0.000565</b>
25	0.012	-0.097	0.121	0.83	0.147	0.060	0.235	<b>0.001244</b>
26	0.002	-0.107	0.111	0.97	0.134	0.046	0.221	<b>0.003224</b>
27	-0.010	-0.119	0.099	0.86	0.116	0.029	0.203	<b>0.009786</b>
28	-0.024	-0.133	0.086	0.67	0.095	0.009	0.182	<b>0.033107</b>
29	-0.039	-0.149	0.071	0.49	0.070	-0.016	0.157	0.11
30	-0.055	-0.166	0.057	0.34	0.043	-0.043	0.129	0.33
31	-0.069	-0.181	0.043	0.23	0.015	-0.070	0.101	0.72
32	-0.081	-0.195	0.032	0.16	-0.010	-0.095	0.075	0.81
33	-0.091	-0.205	0.024	0.12	-0.032	-0.117	0.053	0.47
34	-0.098	-0.213	0.018	0.10	-0.048	-0.133	0.037	0.27
35	-0.102	-0.217	0.014	0.09	-0.058	-0.143	0.027	0.18
36	-0.103	-0.219	0.012	0.08	-0.062	-0.147	0.023	0.15
37	-0.103	-0.218	0.013	0.08	-0.060	-0.145	0.025	0.17
38	-0.100	-0.215	0.016	0.09	-0.052	-0.137	0.034	0.24
39	-0.094	-0.208	0.021	0.11	-0.036	-0.122	0.049	0.41
40	-0.084	-0.197	0.029	0.15	-0.014	-0.100	0.072	0.75

Adjusted for maternal age, pre-pregnancy body mass index, race/ethnicity, marital status, educational status, health insurance ownership, parity, and mode of onset of labor. Statistically significant associations ( $p < 0.05$ ) are marked in bold.

**Supplementary Table 7. Change in femur length z-score at 13-40 weeks gestation per one week increase in placental age acceleration in male and female fetuses.**

Gestational week	Male				Female			
	Beta	95% CI		<i>p</i>	Beta	95% CI		<i>p</i>
		Lower	Upper			Lower	Upper	
13	0.032	-0.076	0.141	0.56	0.179	0.087	0.271	<b>0.000219</b>
14	0.032	-0.076	0.141	0.56	0.179	0.087	0.271	<b>0.000218</b>
15	0.032	-0.077	0.141	0.56	0.178	0.086	0.270	<b>0.000219</b>
16	0.032	-0.077	0.140	0.57	0.177	0.086	0.269	<b>0.000222</b>
17	0.031	-0.078	0.140	0.58	0.177	0.086	0.268	<b>0.000227</b>
18	0.030	-0.078	0.139	0.58	0.176	0.085	0.266	<b>0.000237</b>
19	0.029	-0.079	0.138	0.60	0.174	0.084	0.265	<b>0.000252</b>
20	0.028	-0.081	0.137	0.61	0.173	0.082	0.263	<b>0.000274</b>
21	0.027	-0.082	0.135	0.63	0.170	0.081	0.260	<b>0.000308</b>
22	0.025	-0.084	0.133	0.66	0.168	0.078	0.257	<b>0.000362</b>
23	0.022	-0.087	0.131	0.69	0.164	0.075	0.253	<b>0.000451</b>
24	0.019	-0.090	0.127	0.74	0.159	0.071	0.248	<b>0.00061</b>
25	0.014	-0.094	0.122	0.80	0.153	0.065	0.241	<b>0.000927</b>
26	0.008	-0.099	0.116	0.88	0.144	0.056	0.232	<b>0.001654</b>
27	0.001	-0.107	0.109	0.99	0.132	0.045	0.219	<b>0.003672</b>
28	-0.009	-0.116	0.099	0.87	0.115	0.028	0.202	<b>0.010653</b>
29	-0.021	-0.128	0.086	0.70	0.092	0.005	0.179	<b>0.039932</b>
30	-0.035	-0.142	0.073	0.53	0.062	-0.025	0.149	0.16
31	-0.049	-0.157	0.059	0.37	0.027	-0.061	0.116	0.54
32	-0.062	-0.171	0.047	0.27	-0.008	-0.097	0.082	0.87
33	-0.072	-0.181	0.038	0.20	-0.038	-0.129	0.053	0.41
34	-0.078	-0.189	0.033	0.17	-0.060	-0.152	0.032	0.20
35	-0.082	-0.193	0.029	0.15	-0.073	-0.166	0.020	0.12
36	-0.083	-0.195	0.028	0.14	-0.077	-0.171	0.016	0.11
37	-0.084	-0.194	0.027	0.14	-0.073	-0.166	0.020	0.13
38	-0.082	-0.192	0.029	0.15	-0.059	-0.151	0.034	0.22
39	-0.076	-0.186	0.033	0.17	-0.033	-0.126	0.059	0.48
40	-0.067	-0.174	0.041	0.23	0.002	-0.089	0.093	0.96

Adjusted for maternal age, pre-pregnancy body mass index, race/ethnicity, marital status, educational status, health insurance ownership, parity, and mode of onset of labor. Statistically significant associations ( $p < 0.05$ ) are marked in bold.