Supplemental Material

Urinary polycyclic aromatic hydrocarbons in relation to anthropometric measures and pubertal development in a cohort of Northern California girls

Table S1. BMI and waist-to-height by age in creatinine-corrected tertiles of urinary 2-naphthol concentrations: predicted means and difference (95% CIs) based on mixed effects models in 404 girls, BCERP Northern California site.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age (years) | tertile 1/low | tertile 2/medium | tertile 3/high | Difference between tertile 1 and tertile 3 | p-value |
| BMI (kg/m2) |  |  |  |  |  |  |  |  |
| 7 | 16.4 | (15.7-17.1) | 16.8 | (16.2-17.4) | 17.3 | (16.6-17.9) | 0.8 | (-0.1-1.8) | 0.086 |
| 8 | 17.0 | (16.3-17.7) | 17.5 | (16.9-18.1) | 18.0 | (17.4-18.6) | 1.0 | (0.1-1.9) | 0.033 |
| 9 | 17.6 | (16.9-18.3) | 18.2 | (17.6-18.8) | 18.8 | (18.1-19.4) | 1.1 | (0.2-2.0) | 0.014 |
| 10 | 18.2 | (17.6-18.9) | 18.9 | (18.3-19.5) | 19.5 | (18.9-20.1) | 1.2 | (0.3-2.2) | 0.007 |
| 11 | 18.9 | (18.2-19.6) | 19.7 | (19.0-20.3) | 20.2 | (19.6-20.9) | 1.3 | (0.4-2.2) | 0.004 |
| 12 | 19.6 | (18.9-20.3) | 20.4 | (19.8-21) | 21.0 | (20.3-21.6) | 1.4 | (0.5-2.3) | 0.003 |
| 13 | 20.3 | (19.6-21.0) | 21.2 | (20.6-21.8) | 21.7 | (21.1-22.3) | 1.4 | (0.5-2.3) | 0.002 |
| 14 | 21.0 | (20.3-21.7) | 22.0 | (21.4-22.6) | 22.4 | (21.8-23.0) | 1.4 | (0.5-2.3) | 0.003 |
| 15 | 21.8 | (21.1-22.5) | 22.8 | (22.2-23.4) | 23.1 | (22.5-23.8) | 1.4 | (0.4-2.3) | 0.004 |
| 16 | 22.6 | (21.8-23.3) | 23.6 | (23.0-24.3) | 23.9 | (23.2-24.5) | 1.3 | (0.3-2.3) | 0.008 |
| Waist-to-height ratio |  |  |  |  |  |  |  |
| 7 | 0.476 | (0.465-0.487) | 0.487 | (0.477-0.497) | 0.495 | (0.485-0.505) | 0.018 | (0.004-0.033) | 0.015 |
| 8 | 0.472 | (0.461-0.482) | 0.481 | (0.472-0.491) | 0.490 | (0.480-0.499) | 0.018 | (0.004-0.032) | 0.014 |
| 9 | 0.468 | (0.458-0.478) | 0.477 | (0.467-0.486) | 0.485 | (0.476-0.495) | 0.017 | (0.003-0.031) | 0.015 |
| 10 | 0.465 | (0.455-0.476) | 0.474 | (0.464-0.483) | 0.482 | (0.473-0.492) | 0.017 | (0.003-0.031) | 0.018 |
| 11 | 0.463 | (0.453-0.474) | 0.472 | (0.462-0.481) | 0.480 | (0.470-0.489) | 0.017 | (0.002-0.031) | 0.021 |
| 12 | 0.462 | (0.452-0.473) | 0.471 | (0.461-0.480) | 0.478 | (0.469-0.488) | 0.016 | (0.002-0.030) | 0.024 |
| 13 | 0.462 | (0.452-0.473) | 0.471 | (0.462-0.481) | 0.478 | (0.468-0.488) | 0.016 | (0.002-0.030) | 0.026 |
| 14 | 0.463 | (0.452-0.473) | 0.473 | (0.463-0.482) | 0.479 | (0.469-0.488) | 0.016 | (0.002-0.030) | 0.028 |
| 15 | 0.465 | (0.454-0.475) | 0.475 | (0.465-0.485) | 0.480 | (0.470-0.490) | 0.016 | (0.001-0.030) | 0.033 |
| 16 | 0.467 | (0.456-0.478) | 0.479 | (0.469-0.490) | 0.483 | (0.472-0.493) | 0.016 | (0-0.031) | 0.045 |

Predicted means and differences were computed from mixed models that included PAH concentration tertile, age, age squared, a term for interaction between age and PAH tertile, a term for interaction between age squared and PAH tertile, race/ethnicity, and a term for interaction between race/ethnicity and age.

Table S2. BMI and waist-to-height by age in creatinine-corrected tertiles of urinary Σfluorene concentrations: predicted means and difference (95% CIs) based on mixed effects models in 404 girls, BCERP Northern California site.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age (years) | tertile 1/low | tertile 2/medium | tertile 3/high | Difference between tertile 1 and tertile 3 | p-value |
| BMI (kg/m2) |  |  |  |  |  |  |  |  |
| 7 | 16.4 | (15.8-17.1) | 17.0 | (16.4-17.7) | 17.1 | (16.5-17.8) | 0.7 | (-0.2-1.6) | 0.111 |
| 8 | 17.0 | (16.4-17.7) | 17.7 | (17.1-18.3) | 17.9 | (17.3-18.5) | 0.9 | (0-1.7) | 0.051 |
| 9 | 17.6 | (17.0-18.3) | 18.4 | (17.8-19.0) | 18.6 | (18.0-19.2) | 1.0 | (0.1-1.8) | 0.024 |
| 10 | 18.3 | (17.6-18.9) | 19.1 | (18.5-19.7) | 19.4 | (18.8-20.0) | 1.1 | (0.3-2.0) | 0.011 |
| 11 | 18.9 | (18.3-19.6) | 19.8 | (19.2-20.5) | 20.1 | (19.5-20.8) | 1.2 | (0.4-2.1) | 0.005 |
| 12 | 19.6 | (18.9-20.2) | 20.6 | (19.9-21.2) | 20.9 | (20.3-21.5) | 1.3 | (0.5-2.2) | 0.003 |
| 13 | 20.3 | (19.6-20.9) | 21.3 | (20.7-21.9) | 21.7 | (21.1-22.3) | 1.4 | (0.6-2.3) | 0.001 |
| 14 | 21.0 | (20.3-21.6) | 22.1 | (21.4-22.7) | 22.5 | (21.9-23.1) | 1.5 | (0.7-2.4) | <.001 |
| 15 | 21.7 | (21.0-22.3) | 22.8 | (22.2-23.5) | 23.3 | (22.7-23.9) | 1.6 | (0.7-2.5) | <.001 |
| 16 | 22.4 | (21.8-23.1) | 23.6 | (23.0-24.3) | 24.1 | (23.5-24.8) | 1.7 | (0.8-2.6) | <.001 |
| Waist-to-height ratio |  |  |  |  |  |  |  |
| 7 | 0.477 | (0.467-0.488) | 0.489 | (0.479-0.499) | 0.493 | (0.483-0.503) | 0.016 | (0.002-0.03) | 0.025 |
| 8 | 0.471 | (0.461-0.481) | 0.484 | (0.474-0.494) | 0.489 | (0.479-0.498) | 0.018 | (0.004-0.031) | 0.010 |
| 9 | 0.466 | (0.457-0.476) | 0.480 | (0.470-0.489) | 0.485 | (0.476-0.495) | 0.019 | (0.006-0.032) | 0.005 |
| 10 | 0.462 | (0.453-0.472) | 0.477 | (0.467-0.487) | 0.483 | (0.473-0.492) | 0.020 | (0.007-0.033) | 0.003 |
| 11 | 0.460 | (0.450-0.469) | 0.475 | (0.465-0.485) | 0.481 | (0.471-0.490) | 0.021 | (0.008-0.035) | 0.002 |
| 12 | 0.458 | (0.448-0.468) | 0.474 | (0.465-0.484) | 0.480 | (0.471-0.490) | 0.022 | (0.009-0.035) | 0.001 |
| 13 | 0.457 | (0.448-0.467) | 0.475 | (0.465-0.484) | 0.480 | (0.471-0.490) | 0.023 | (0.010-0.036) | 0.001 |
| 14 | 0.458 | (0.448-0.468) | 0.476 | (0.467-0.486) | 0.481 | (0.472-0.491) | 0.023 | (0.010-0.037) | 0.001 |
| 15 | 0.459 | (0.449-0.469) | 0.479 | (0.469-0.489) | 0.483 | (0.473-0.493) | 0.024 | (0.010-0.037) | 0.001 |
| 16 | 0.462 | (0.451-0.472) | 0.483 | (0.472-0.493) | 0.486 | (0.475-0.496) | 0.024 | (0.009-0.038) | 0.001 |

Predicted means and differences were computed from mixed models that included PAH concentration tertile, age, age squared, a term for interaction between age and PAH tertile, a term for interaction between age squared and PAH tertile, race/ethnicity, and a term for interaction between race/ethnicity and age.

Table S3. BMI and waist-to-height by age in creatinine-corrected tertiles of urinary Σphenanthrene concentrations: predicted means and difference (95% CIs) based on mixed effects models in 404 girls, BCERP Northern California site.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age (years) | tertile 1/low | tertile 2/medium | tertile 3/high | Difference between tertile 1 and tertile 3 | p-value |
| BMI (kg/m2) |  |  |  |  |  |  |  |  |
| 7 | 16.5 | (15.8-17.2) | 16.9 | (16.3-17.6) | 17.2 | (16.5-17.8) | 0.7 | (-0.2-1.6) | 0.147 |
| 8 | 17.1 | (16.5-17.8) | 17.6 | (17.0-18.3) | 17.8 | (17.2-18.4) | 0.6 | (-0.2-1.5) | 0.145 |
| 9 | 17.8 | (17.2-18.5) | 18.4 | (17.7-19.0) | 18.5 | (17.9-19.1) | 0.7 | (-0.2-1.5) | 0.133 |
| 10 | 18.5 | (17.9-19.1) | 19.1 | (18.4-19.7) | 19.2 | (18.6-19.8) | 0.7 | (-0.2-1.6) | 0.111 |
| 11 | 19.2 | (18.5-19.8) | 19.8 | (19.1-20.4) | 19.9 | (19.3-20.6) | 0.8 | (-0.1-1.6) | 0.081 |
| 12 | 19.9 | (19.2-20.5) | 20.5 | (19.8-21.1) | 20.7 | (20.1-21.4) | 0.9 | (0-1.7) | 0.049 |
| 13 | 20.6 | (19.9-21.2) | 21.2 | (20.5-21.8) | 21.6 | (20.9-22.2) | 1.0 | (0.1-1.9) | 0.024 |
| 14 | 21.3 | (20.6-21.9) | 21.9 | (21.2-22.5) | 22.4 | (21.8-23.0) | 1.2 | (0.3-2.0) | 0.009 |
| 15 | 22.0 | (21.3-22.6) | 22.5 | (21.9-23.2) | 23.3 | (22.7-23.9) | 1.3 | (0.5-2.2) | 0.003 |
| 16 | 22.7 | (22.0-23.4) | 23.2 | (22.5-23.9) | 24.2 | (23.6-24.9) | 1.6 | (0.6-2.5) | <.001 |
| Waist-to-height ratio |  |  |  |  |  |  |  |
| 7 | 0.478 | (0.468-0.489) | 0.488 | (0.478-0.498) | 0.493 | (0.483-0.503) | 0.015 | (0.001-0.029) | 0.041 |
| 8 | 0.473 | (0.463-0.483) | 0.484 | (0.474-0.494) | 0.487 | (0.477-0.497) | 0.014 | (0-0.027) | 0.043 |
| 9 | 0.469 | (0.459-0.479) | 0.480 | (0.470-0.490) | 0.482 | (0.473-0.492) | 0.013 | (0-0.027) | 0.046 |
| 10 | 0.466 | (0.456-0.475) | 0.477 | (0.467-0.487) | 0.479 | (0.470-0.489) | 0.014 | (0-0.027) | 0.046 |
| 11 | 0.463 | (0.453-0.473) | 0.475 | (0.465-0.485) | 0.477 | (0.468-0.487) | 0.014 | (0.001-0.027) | 0.041 |
| 12 | 0.462 | (0.452-0.472) | 0.474 | (0.464-0.484) | 0.477 | (0.467-0.486) | 0.015 | (0.001-0.028) | 0.030 |
| 13 | 0.461 | (0.452-0.471) | 0.474 | (0.464-0.483) | 0.477 | (0.468-0.487) | 0.016 | (0.003-0.029) | 0.019 |
| 14 | 0.462 | (0.452-0.472) | 0.474 | (0.464-0.484) | 0.479 | (0.470-0.489) | 0.018 | (0.004-0.031) | 0.010 |
| 15 | 0.463 | (0.453-0.473) | 0.475 | (0.465-0.485) | 0.483 | (0.473-0.493) | 0.020 | (0.006-0.033) | 0.005 |
| 16 | 0.465 | (0.455-0.476) | 0.477 | (0.466-0.487) | 0.488 | (0.477-0.498) | 0.022 | (0.008-0.037) | 0.003 |

Predicted means and differences were computed from mixed models that included PAH concentration tertile, age, age squared, a term for interaction between age and PAH tertile, a term for interaction between age squared and PAH tertile, race/ethnicity, and a term for interaction between race/ethnicity and age.

Table S4. BMI and waist-to-height by age in creatinine-corrected tertiles of urinary 1-hydroxypyrene concentrations: predicted means and difference (95% CIs) based on mixed effects models in 402 girls, BCERP Northern California site.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age (years) | tertile 1/low | tertile 2/medium | tertile 3/high | Difference between tertile 1 and tertile 3 | p-value |
| BMI (kg/m2) |  |  |  |  |  |  |  |  |
| 7 | 16.5 | (15.8-17.2) | 17.1 | (16.5-17.8) | 16.9 | (16.2-17.5) | 0.4 | (-0.5-1.3) | 0.423 |
| 8 | 17.2 | (16.5-17.8) | 17.8 | (17.2-18.4) | 17.6 | (17.0-18.2) | 0.4 | (-0.4-1.3) | 0.320 |
| 9 | 17.8 | (17.2-18.5) | 18.5 | (17.9-19.1) | 18.3 | (17.7-19) | 0.5 | (-0.4-1.4) | 0.244 |
| 10 | 18.5 | (17.8-19.1) | 19.2 | (18.6-19.8) | 19.1 | (18.5-19.7) | 0.6 | (-0.3-1.5) | 0.189 |
| 11 | 19.2 | (18.5-19.8) | 19.9 | (19.3-20.5) | 19.8 | (19.2-20.4) | 0.6 | (-0.2-1.5) | 0.147 |
| 12 | 19.9 | (19.2-20.5) | 20.6 | (20.0-21.3) | 20.6 | (19.9-21.2) | 0.7 | (-0.2-1.6) | 0.114 |
| 13 | 20.6 | (19.9-21.2) | 21.4 | (20.7-22.0) | 21.3 | (20.7-22.0) | 0.8 | (-0.1-1.6) | 0.088 |
| 14 | 21.3 | (20.6-21.9) | 22.1 | (21.5-22.8) | 22.1 | (21.5-22.7) | 0.8 | (-0.1-1.7) | 0.069 |
| 15 | 22.0 | (21.4-22.7) | 22.9 | (22.3-23.6) | 22.9 | (22.2-23.5) | 0.9 | (0-1.8) | 0.058 |
| 16 | 22.8 | (22.1-23.4) | 23.7 | (23.0-24.4) | 23.7 | (23.0-24.3) | 0.9 | (0-1.8) | 0.056 |
| Waist-to-height ratio |  |  |  |  |  |  |  |
| 7 | 0.478 | (0.467-0.488) | 0.490 | (0.480-0.501) | 0.491 | (0.481-0.501) | 0.013 | (-0.001-0.027) | 0.076 |
| 8 | 0.472 | (0.462-0.482) | 0.485 | (0.476-0.495) | 0.485 | (0.476-0.495) | 0.013 | (-0.001-0.027) | 0.059 |
| 9 | 0.468 | (0.458-0.478) | 0.482 | (0.472-0.491) | 0.481 | (0.472-0.491) | 0.013 | (0-0.027) | 0.052 |
| 10 | 0.465 | (0.455-0.475) | 0.479 | (0.469-0.488) | 0.478 | (0.469-0.488) | 0.013 | (0-0.027) | 0.049 |
| 11 | 0.463 | (0.453-0.473) | 0.477 | (0.467-0.487) | 0.476 | (0.467-0.486) | 0.014 | (0-0.027) | 0.046 |
| 12 | 0.461 | (0.451-0.471) | 0.476 | (0.466-0.486) | 0.475 | (0.466-0.485) | 0.014 | (0-0.027) | 0.042 |
| 13 | 0.461 | (0.451-0.471) | 0.476 | (0.466-0.486) | 0.475 | (0.466-0.485) | 0.014 | (0.001-0.028) | 0.038 |
| 14 | 0.462 | (0.452-0.472) | 0.477 | (0.467-0.487) | 0.476 | (0.467-0.486) | 0.015 | (0.001-0.028) | 0.035 |
| 15 | 0.464 | (0.453-0.474) | 0.479 | (0.469-0.489) | 0.478 | (0.469-0.488) | 0.015 | (0.001-0.029) | 0.035 |
| 16 | 0.466 | (0.456-0.477) | 0.482 | (0.471-0.493) | 0.481 | (0.471-0.492) | 0.015 | (0.001-0.03) | 0.042 |

Predicted means and differences were computed from mixed models that included PAH concentration tertile, age, age squared, a term for interaction between age and PAH tertile, a term for interaction between age squared and PAH tertile, race/ethnicity, and a term for interaction between race/ethnicity and age.

Table S5. BMI and waist-to-height by age in creatinine-corrected tertiles of urinary ΣmolPAHs concentrations: predicted means and difference (95% CIs) based on mixed effects models in 402 girls, BCERP Northern California site.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age (years) | tertile 1/low | tertile 2/medium | tertile 3/high | Difference between tertile 1 and tertile 3 | p-value |
| BMI (kg/m2) |  |  |  |  |  |  |  |  |
| 7 | 16.5 | (15.8-17.2) | 16.7 | (16.1-17.4) | 17.2 | (16.5-17.8) | 0.6 | (-0.3-1.6) | 0.178 |
| 8 | 17.1 | (16.4-17.8) | 17.4 | (16.8-18.0) | 18.0 | (17.4-18.6) | 0.9 | (0-1.8) | 0.060 |
| 9 | 17.7 | (17.0-18.4) | 18.1 | (17.5-18.7) | 18.8 | (18.1-19.4) | 1.1 | (0.2-2.0) | 0.020 |
| 10 | 18.3 | (17.6-19.0) | 18.8 | (18.2-19.4) | 19.5 | (18.9-20.1) | 1.2 | (0.3-2.1) | 0.008 |
| 11 | 18.9 | (18.3-19.6) | 19.6 | (18.9-20.2) | 20.3 | (19.7-20.9) | 1.3 | (0.4-2.3) | 0.003 |
| 12 | 19.6 | (18.9-20.3) | 20.3 | (19.7-20.9) | 21.0 | (20.4-21.7) | 1.4 | (0.5-2.3) | 0.002 |
| 13 | 20.3 | (19.6-21.0) | 21.1 | (20.4-21.7) | 21.8 | (21.2-22.4) | 1.5 | (0.6-2.4) | 0.001 |
| 14 | 21.0 | (20.3-21.7) | 21.9 | (21.2-22.5) | 22.5 | (21.9-23.1) | 1.5 | (0.6-2.4) | 0.001 |
| 15 | 21.8 | (21.1-22.4) | 22.7 | (22.0-23.3) | 23.3 | (22.6-23.9) | 1.5 | (0.6-2.4) | 0.001 |
| 16 | 22.5 | (21.8-23.2) | 23.5 | (22.8-24.2) | 24.0 | (23.3-24.6) | 1.4 | (0.5-2.4) | 0.003 |
| Waist-to-height ratio |  |  |  |  |  |  |  |
| 7 | 0.478 | (0.467-0.489) | 0.486 | (0.476-0.496) | 0.493 | (0.483-0.503) | 0.015 | (0-0.030) | 0.043 |
| 8 | 0.473 | (0.463-0.484) | 0.480 | (0.471-0.490) | 0.489 | (0.479-0.498) | 0.015 | (0.001-0.029) | 0.032 |
| 9 | 0.469 | (0.459-0.480) | 0.476 | (0.466-0.486) | 0.485 | (0.475-0.494) | 0.016 | (0.002-0.029) | 0.028 |
| 10 | 0.466 | (0.456-0.477) | 0.473 | (0.463-0.482) | 0.482 | (0.472-0.491) | 0.016 | (0.002-0.030) | 0.026 |
| 11 | 0.464 | (0.453-0.474) | 0.471 | (0.461-0.481) | 0.480 | (0.470-0.489) | 0.016 | (0.002-0.030) | 0.025 |
| 12 | 0.462 | (0.452-0.473) | 0.470 | (0.460-0.480) | 0.479 | (0.469-0.488) | 0.016 | (0.002-0.030) | 0.023 |
| 13 | 0.462 | (0.451-0.472) | 0.471 | (0.461-0.480) | 0.478 | (0.469-0.488) | 0.016 | (0.002-0.030) | 0.021 |
| 14 | 0.462 | (0.452-0.472) | 0.472 | (0.463-0.482) | 0.479 | (0.469-0.489) | 0.017 | (0.003-0.031) | 0.020 |
| 15 | 0.464 | (0.453-0.474) | 0.475 | (0.465-0.485) | 0.481 | (0.471-0.490) | 0.017 | (0.003-0.031) | 0.021 |
| 16 | 0.466 | (0.455-0.477) | 0.480 | (0.469-0.490) | 0.483 | (0.473-0.493) | 0.017 | (0.002-0.032) | 0.027 |

Predicted means and differences were computed from mixed models that included PAH concentration tertile, age, age squared, a term for interaction between age and PAH tertile, a term for interaction between age squared and PAH tertile, race/ethnicity, and a term for interaction between race/ethnicity and age.