Research for a Healthier Future

SELMA

Prenatal exposure to mixtures of endocrine disrupting chemicals and children's growth up to six years of age in the SELMA study

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Conclusion

Prenatal EDCs impact early childhood growth

Background

- Periods of accelerated growth may contribute risk of developing metabolic disease and obesity later in childhood and adulthood.
- Prenatal exposures to chemicals with endocrine disrupting properties (EDCs), and their concurrent and combined mixture effect may impact children's growth trajectory.

Methods

- 1,549 mother-child pair participating in the Swedish Environmental Longitudinal Mother and child Asthma and allergy (SELMA) study.
- EDC mixture included 41 metabolites measured in urine and blood during first trimester of pregnancy.
- Each child's individual weight trajectory, from birth to 5.5 years of age, was fitted using a double-logistic model.
- The EDCs mixture was analyzed with the following growth parameters: birthweight (g), infant growth spurt slope (kg/months), infant age (months) at peak weight velocity (PWV) and weight plateau (kg).

Table 1 - Sociodemographic characteristics of the Study Population, n=1,549

	Overall (n=1,549)	Female (n=731)	Male (n=818)
	Mean (SD)	**Mean (SD)**	**Mean (SD)**
Age (years)	30.9 (4.9)	31.0 (4.9)	30.9 (4.8)
Weight (kg)	69.3 (13.4)	69.2 (13.4)	69.5 (13.5)
Fish intake index	4.2 (2.1)	4.2 (2.1)	4.1 (2.1)
Gestational age	39.5 (1.8)	39.5 (1.7)	39.4 (1.8)
Birthweight (kg)*	3.626 (0.561)	3.563 (0.540)	3.682 (0.573)
	n (%)	**n (%)**	**n (%)**
More than high school education	926 (62.0)	428 (60.9)	498 (63.0)
Smoker	101 (6.5)	50 (6.8)	51 (6.2)
Parity (Multiparous)	843 (54.4)	394 (53.9)	449 (54.9)

Results

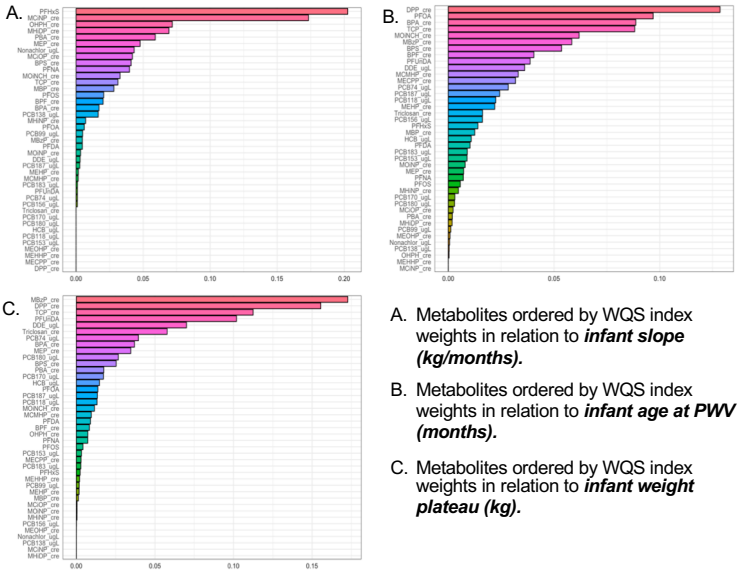
- Prenatal exposure to the EDC mixture was associated with an increase in infant growth spurt slope, increased weight plateau, and marginally significant with an older age at PWV among boys.

Table 2 – Adjusted estimates from WQS regression of EDC mixtures and growth parameters†

	Overall	Female	Male
	Beta (95%CI)	**Beta (95%CI)**	**Beta (95%CI)**
Infant slope (β_1) (kg/months)	-0.006 (-0.02, 0.01)	-0.004 (-0.03,0.02)	0.016 (0.002, 0.03)**
Infant Age at PWV (δ_1) (months)	0.008 (-0.14, 0.15)	0.11 (-0.08, 0.30)	0.13 (-0.01, 0.26)*
Weight Plateau (α_1) (kg)	0.06 (-0.13, 0.25)	0.04 (-0.24, 0.31)	0.37 (0.17, 0.56)**
Birthweight (kg)	-15.75 (-46.3, 14.83)	-18.46 (-56.86, 19.95)	-14.0 (-61.3, 33.4)

†Adjusted for maternal weight, education, smoking, parity, fish intake index, child's sex and gestational age at birth. Stratified models were not adjusted for sex.
*P-value<0.10, **P-value<0.05

Figure 1 – EDC mixture metabolites ordered in significance to growth parameters



A. Metabolites ordered by WQS index weights in relation to ***infant slope (kg/months).***

B. Metabolites ordered by WQS index weights in relation to ***infant age at PWV (months).***

C. Metabolites ordered by WQS index weights in relation to ***infant weight plateau (kg).***

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