BACKGROUND

Large scale bio-monitoring programs around the world have provided extensive information on human exposure to man-made chemicals and it is evident that humans are ubiquitously and increasingly exposed to many of these compounds. One group of chemicals, for which a strong concern is expressed, is compounds with suspected endocrine disrupting properties (EDCs). Hundreds of research articles during the last two decades have identified several topics for concern for such exposure. Firstly, EDCs can have effects at low doses, and evidence shows that there might be non-monotonic dose response relationships. Secondly, EDC exposure is probably more important during development in the prenatal and infancy period but the effects can be delayed. Thirdly, EDCs can be found in a large number of commonly used consumer products meaning that everyone is exposed, including pregnant women and infants. Lastly, a large number of epidemiological studies have reported a possible relationship between EDC exposure and multiple chronic illnesses such as neurodevelopmental disorders, asthma and allergy, reproduction and infertility and overweight and obesity meaning that this is related to a major public health issue.

AIM

The SELMA study aims to investigate the importance of early life exposure to endocrine disrupting chemicals during the pregnancy and infancy period for the development of multiple chronic diseases/disorders in offspring children.

METHOD

The recruitment of pregnant women and the data collection and screening procedures have been conducted in connection to the routinely performed examinations at the public Antenatal Care Centres (ACCs) and each child visits the CHCs about 20 times during the pregnancy, three times during the first year of life and 15 weeks and a filter sock placed on the families´ vacuum cleaner. In addition, indoor air samples have been collected by the Indoor settled dust have been collected by the

Biological sampling

Biological samples have been taken from the pregnant women and the child and are kept frozen (-80°C for serum and -20°C for urine) in a bio-bank including serum and morning urine from the pregnant women at their first visit at ACC during the 18th week of pregnancy, cord blood at delivery, and urine samples from the child at 2-4 months and at 12 months of age. Blood and urine will be collected from the child at the age of seven.

Environmental sampling

Indoor settled dust have been collected by the families themselves in all participating homes during the pregnancy and the infancy period by vacuuming and a filter sock placed on the families´ vacuum cleaner. In addition, indoor air samples (passive PUF and texar) have been taken in 165 randomly selected homes and are stored frozen for analyzing the air concentration of VOC:s and SVOC:s.

SCREENING EXPOSURE PERIOD

The SELMA study is conducted in collaboration between Harvard School of Public Health and Mount Sinai and Lund University. International collaborators are described in the figure.

CONCEPTION Biobank


data collection and research tracks in the SELMA study

The SELMA study is a birth cohort following more than 2,000 mother-child pairs, with focus on health risks in children due to exposure to endocrine disruptor chemicals in early life.

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EXPOSURE ANALYSES

Eight chemicals classes is being measured in serum and urine for the pregnant women (week 10) and the child at different ages including in total 51 compounds (see table), 21 non-persistent compounds representing four classes of pollutants: Polychlorinated biphenyls (PCB:s), lipophilic, polycyclic aromatic hydrocarbons (PAHs) and pesticides, and 30 POPs which fall into four classes of pollutants: Phthalates, alkyl phenols, polybrominated diphenyl ethers (PBDE:s), and organochlorine pesticides (OCs).

EEDC:s ANALYZED IN URINE AND SERUM IN THE SELMA-STUDY

EXPOSURE PERIOD

1-3 months, 6-9 months, 1, 2, 6, 12, 18 months

DATA COLLECTION AND RESEARCH TRACKS IN THE SELMA STUDY

CONCEPTION Biobank

Urine

Blood

Biological sampling

Environmental sampling

Questions

Questionnaires focusing on the family’s life styles, use of consumer products/articles, building characteristics, home furnishings and renovations, food habits, and health of the family and the child (incl. ISAAC asthma/allergy symptoms), etc. have been used two times during the pregnancy, three times during infancy and later on.

Health examination

The national child health promotion program (Eds, national child health promotion program) is attended by virtually all children in Sweden. Pregnant women visit an Antenatal Care Centre at least once a month during pregnancy and are monitored continuously throughout the pregnancy.

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