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Press information

Early Environmental Exposures and Child Respiratory Health: the Exposome Reveals its Preliminary Results

A team of researchers from Inserm, CNRS, Université Grenoble Alpes and Barcelona Institute for Global Health has shown that prenatal and postnatal exposure to various chemical pollutants is linked to decreased respiratory function in children. These results, based on the concept of the exposome (defined as the totality of an individual's environmental exposures from conception until old age), were obtained as part of the European HELIX project and have been published in [The Lancet Planetary Health](#).

With the changes in our lifestyles and the development of synthetic chemistry, exposure to environmental contaminants has become multiple and complex. Pregnancy and the early years of life are recognized as being periods of high sensitivity to environmental factors, with potential lifetime health consequences for the child. Researchers from Inserm, CNRS, Université Grenoble Alpes and Barcelona Institute for Global Health have measured a large number of environmental factors to which children are exposed – including through maternal exposure during pregnancy –, and which are defined as the "early life exposome". The objective of this approach is to link these exposures to the health of children between 6 and 12 years of age, particularly respiratory function.

The researchers collected data from prenatal and postnatal exposures related to the external environment (pollution of the air with fine particles, noise...), chemical contaminants (endocrine disruptors, metals, persistent organic pollutants...), and lifestyle (diet...) in over 1,000 pregnant women and their children in six European countries. Through 85 prenatal exposures and 125 postnatal exposures, a snapshot of the early-life environment was established for each child. The pregnant women and the children had generally been exposed to dozens of chemical substances at variable levels. Over two-thirds of the chemical exposure biomarkers had levels detectable in at least 9 women or 9 children out of 10.

The analysis suggests that prenatal exposure to perfluorinated compounds (used for their hydrophobic properties in various industrial and consumer products, such as some non-stick kitchen utensils or stain-resistant coatings) and postnatal exposure to ethylparaben (a paraben used as a preservative in cosmetics) and metabolites of phthalates (diethylhexyl phthalate (DEHP), a known endocrine disruptor, and diisononyl phthalate (DINP), used as a plasticizer) could be linked to decreased respiratory function in children.

This study, one of the very first large-scale implementations of the exposome approach, suggests links between pre- and postnatal exposure to chemical substances and deteriorated respiratory function in children. Valérie Siroux, Inserm researcher and joint-coordinator of the study specifies: *"Identifying the risk factors of decreased early-life respiratory function is important because lung development is a determinant factor not just of a child's lifetime respiratory health, but also their general health"*.

This exposome approach must be seen as an initial selection step making it possible to identify questionable exposures for which more specific research is needed.

Sources

Early-Life exposome and lung function in children from the Helix cohort. The Lancet Planetary Health

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