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Prenatal Exposure to Paracetamol Associated With ADHD and Autism Symptoms in Childhood

ISGlobal study of more than 70,000 European children bolsters the findings of previous research

Barcelona, 28 May 2021- An epidemiological study of more than 70,000 children in six European cohorts has linked symptoms of attention-deficit/hyperactivity disorder (**ADHD**) and autism spectrum conditions (**ASC**) to the mothers' use of **paracetamol** (acetaminophen) **during pregnancy**. The study, published in the *European Journal of Epidemiology*, was led by the Barcelona Institute for Global Health ([ISGlobal](#)), a centre supported by the "la Caixa" Foundation.

In total, the researchers analysed **73,881 children** for whom data were available on prenatal or postnatal exposure to paracetamol, at least one symptom of ASC or ADHD, and main covariates. Depending on the cohort, **14% to 56% of the mothers** reported taking paracetamol while pregnant.

The study found that children exposed to paracetamol before birth were **19% more likely** to develop **ASC symptoms** and **21% more likely** to develop **ADHD symptoms** than children who were not exposed.

"Our findings are consistent with previous research," explained ISGlobal researcher **Sílvia Alemany**, lead author of the study. "We also found that prenatal exposure to paracetamol **affects boys and girls in a similar way**, as we observed practically no differences."

"Our results address some of the weaknesses of previous meta-analyses," commented **Jordi Sunyer**, researcher at ISGlobal and last author of the study. "Considering all the evidence on the use of paracetamol and neurological development, we agree with previous recommendations indicating that while **paracetamol should not be suppressed in pregnant women or children**, it should be **used only when necessary**."

At some point during pregnancy, an estimated 46%-56% of pregnant women in developed countries use paracetamol, which is considered the **safest analgesic/antipyretic** for pregnant women and children. However, mounting evidence has linked prenatal paracetamol exposure to poorer cognitive performance, more behavioural problems, and ASC and ADHD symptoms.

Those previous studies have been criticised for their heterogeneity. In the new study, therefore, "an effort was made to **harmonise the assessment** of ADHD and ASC symptoms and the definition of paracetamol exposure," explained Alemany. "The sample is large," she added, "and it includes cohorts from multiple European countries: the United Kingdom, Denmark, the Netherlands, Italy, Greece and Spain. We also used the same criteria for all of the cohorts, thereby **reducing the heterogeneity of criteria** that has hampered previous studies."

The study also analysed **postnatal exposure to paracetamol** and found **no association** between paracetamol use during childhood and ASC symptoms. Nevertheless, the research team concluded that further studies are needed, given the heterogeneity of postnatal paracetamol exposure among the various cohorts, which ranged from 6% to 92.8%.

The six cohorts included in the study were as follows:

1. Avon Longitudinal Study of Parents and Children (ALSPAC)
2. Danish National Birth Cohort (DNBC)
3. Gene and Environment: Prospective Study on Infancy in Italy (GASPII)
4. Generation R Study
5. INMA (including four subcohorts)
6. Mother-Child Cohort in Crete (RHEA)

Reference

Alemany S, Avella-García C, Liew Z, García-Esteban R, Inoue K, Cadman T, López-Vicente M, González L, Riaño Galán I, Andiarena A, Casas M, Margetaki K, Strandberg-Larsen K, Lawlor DA, El-Marroun H, Tiemeier H, Iñiguez C, Tardón A, Santa-Marina L, Júlvez J, Porta D, Chatzi L, Sunyer J. *Prenatal and postnatal exposure to acetaminophen in relation to autism spectrum and attention-deficit and hyperactivity symptoms in childhood: Meta-analysis in six European population-based cohorts.*

About ISGlobal

The Barcelona Institute for Global Health, ISGlobal, is the fruit of an innovative alliance between the "la Caixa" Foundation and academic and government institutions to contribute to the efforts undertaken by the international community to address the challenges in global health. ISGlobal is a consolidated hub of excellence in research that has grown out of work first started in the world of health care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The pivotal mechanism of its work model is the transfer of knowledge generated by scientific research to practice, a task undertaken by the institute's Education and Policy and Global Development departments. ISGlobal has been named a Severo Ochoa Centre of Excellence and is a member of the CERCA system of the Generalitat de Catalunya.

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