

## Prenatal Exposure to Paracetamol may Increase Autism Spectrum and Hyperactivity Symptoms in Children

**Barcelona, July 1, 2016-** A new study led by ISGlobal has found that **paracetamol** (acetaminophen), which is used extensively during pregnancy, has a strong association with **autism spectrum symptoms in boys** and with **attention-related and hyperactivity symptoms** in both genders.

The findings were published today in the *International Journal of Epidemiology*. This is the **first study** of its kind to report an independent association between the use of this drug in pregnancy and autism spectrum symptoms in children. It is also the first study to report different effects on boys and girls. Comparing persistently exposed to unexposed children, the study has found a **30% increase** in the risk of detriment to **some attention functions**, and an increase of **autism spectrum symptoms in boys**.

Researchers in Spain recruited 2,644 mother-child pairs in a birth cohort study during pregnancy. 88% were evaluated when the child was one year old, and 79.9% were evaluated when they were five years old. Mothers were asked about their use of paracetamol during pregnancy and the frequency of use was classified as never, sporadic, or persistent.

43% of children evaluated at age one and 41% assessed at age five were exposed to paracetamol at some point during the first 32 weeks of pregnancy. When assessed at age five, exposed children had close to **40% higher risk of presenting hyperactivity or impulsivity symptoms**. Persistently exposed children in particular showed poorer performance on a computerised test measuring inattention, impulsivity and visual speed processing. Boys also showed two more autism spectrum symptoms when persistently exposed to paracetamol, compared to non-exposed boys. Authors explained that although they measured symptoms and not diagnoses, an increase in the number of symptoms that a child presents can affect him or her, even if they are not severe enough to warrant a clinical diagnosis of a neurodevelopmental disorder.

**“Paracetamol could be harmful to neurodevelopment** for several reasons. First of all, it relieves pain by acting on cannabinoid receptors in the brain. Since these receptors normally help determine how neurons mature and connect with one another, paracetamol could alter these important processes. It can also affect the development of the immune system, or be directly toxic to some fetuses that may not have the same capacity as an adult to metabolize this drug, or by creating oxidative stress”, explains co-author **Dr. Jordi Júlvez**, researcher at ISGlobal, on the possible mechanisms underlying these effects.

There could also be an explanation for why boys are more likely to have autism spectrum symptoms: “The **male brain may be more vulnerable to harmful influences** during early life”, **Dr. Claudia Avella-García**, researcher at ISGlobal, went on. “Our differing results by gender suggest that androgenic endocrine disruption, to which male brains could

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be more sensitive, may explain the association”.

The study concluded that the widespread exposure of infants to paracetamol *in utero* could increase the number of children with attention deficit/hyperactivity or autism spectrum symptoms. However, they stressed, further studies should be conducted with more precise dosage measurements and that the risks versus benefits of paracetamol use during pregnancy and early life should be assessed before treatment recommendations are made.

### Reference:

Claudia B. Avella-Garcia, Jordi Julvez, Joan Fortuny, Cristina Rebordosa, Raquel Garcia-Esteban, Isolina Riano Galan, Adonina Tardon, Clara L. Rodriguez-Bernal, Carmen Iniguez, Ainara Andiarena, Loreto Santa-Marina and Jordi Sunyer. **Acetaminophen use in pregnancy and neurodevelopment: attention function and autism spectrum symptoms.** International Journal of Epidemiology, 2016 Jun 28. pii: dyw115.

### About ISGlobal

*Following a strategic alliance process over the last three years, the merger between the Centre for Research in Environmental Epidemiology (CREAL) and the Barcelona Institute for Global Health (ISGlobal) was completed on June 30, 2016. The [institution resulting from the merger retains the name of ISGlobal.](#)*

### Contact

Pau Rubio  
[pau.rubio@isglobal.org](mailto:pau.rubio@isglobal.org)  
0034 669 877 850 / 0034 93 227 18 16

Marta Solano  
[marta.solano@isglobal.org](mailto:marta.solano@isglobal.org)  
0034 93 227 18 16

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