

# Acetaminophen (paracetamol) reduces sex hormones level

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Medication was not as safe as previously thought.

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## Background

Acetaminophen (paracetamol) is one of the most used drugs in the world. It is used primarily as an analgesic and antipyretic agent. According to the current clinical guidelines, this drug can be used to treat adults and children. Recommendations for the use of acetaminophen during pregnancy are controversial, but, for example, FDA warns only about the heightened risk of attention deficit disorder in case of long-term use by pregnant women [1](#).

According to the results of systematic reviews, the use of this drug is not associated with an increased risk of severe side effects, and 2 Cochrane reviews did not demonstrate any significant increase in the risk even of any side effects when compared to placebo in adults and children [2](#), [3](#); although, these results are relating only to short-term treatment.

## Results of the new study

Unexpected results were obtained by a group of scientists led by Isaac Cohen from the University of California San Diego [4](#). The researchers analyzed effects of the acetaminophen by observing metabolic profile in 3570 individuals. Scientists were able to study the changes in more than 700 metabolites in response to the medication.

According to the researchers, they had hoped to see changes in markers associated with the liver function as a response to acetaminophen intake. Instead, they observed quite substantial changes in sex hormones level. Thus, the reduction concerned androgenic steroids (dehydroisoandrosterone sulfate, androstenediol monosulfat, etc.), pregnenolone steroids (pregnenolone sulfate and others), and progesterin steroids (pregnen-diol sulfate and others).

Most of the sample consisted of twins. Comparison of the medication's and other environmental effects on twins (when one twin is exposed and other - doesn't) is one of the essential research methods in medicine, which helps to exclude genes influence. Data analysis confirmed that that twin who took the drug had lower levels of sex sulfate hormones.

Scientists were able to identify that acetaminophen and estrogens are metabolized by the same family of enzymes responsible for catalysis of various exogenous and endogenous metabolites. Moreover, it's quite probable that these substances are metabolized by the same representative of this family - SULT1A1.

## Conclusion

It should be noted that without clear clinical data it is difficult to establish negative impact acetaminophen on metabolic health. In the interview with «Medscape,» one of the research team members pointed that women who were taking this drug had a reduced pregnen-diol sulfate to

levels usually observed at the physiological age of 35 years. **However, importantly, these changes were short-lived, and this levels returned to normal within a few days after the last drug intake** [5](#).

On the other hand, the changes in hormonal status may seriously harm fetal development. Especially in the case of long-term treatment. According to scientists, this requires further research.

## **Additional information**

### **Competing interests**

The author declares that no competing interests exist.

## **References**

1. US Food and Drug Administration. FDA Drug Safety Communication: FDA has reviewed possible risks of pain medicine use during pregnancy. *FDA official site*. 2015. [Publisher Full Text](#)
2. Stephens G, Derry S, Moore RA. Paracetamol (acetaminophen) for acute treatment of episodic tension-type headache in adults. *Cochrane Database Syst Rev*. 2016; 16(6):CD011889. [DOI](#) | [PubMed](#)
3. Sjoukes A, Venekamp RP, Pol AC, Hay AD, Little P, Schilder AG, Damoiseaux RA. Paracetamol (acetaminophen) or non-steroidal anti-inflammatory drugs, alone or combined, for pain relief in acute otitis media in children. *Cochrane Database Syst Rev*. 2016; 12:CD011534. [DOI](#) | [PubMed](#)
4. Cohen IV, Cirulli ET, Mitchell MW, Jonsson TJ, Yu J, Shah N, Spector TD, Guo L, Venter JC, Telenti A. Acetaminophen (Paracetamol) Use Modifies the Sulfation of Sex Hormones. *EBioMedicine*. 2018; 28:316-323. [DOI](#) | [PubMed](#)
5. Busko M. Acetaminophen Use Alters Sex Hormones, May Cause Birth Defects?. *Medscape*. 2018. [Publisher Full Text](#)