

Tylenol in Pregnancy Doubles Risk of Autism

STORY AT-A-GLANCE

- Abnormal hormonal exposures in pregnancy can influence fetal brain development, and research published in 2014 warned acetaminophen is in fact a hormone disruptor
- According to that 2014 study, use of acetaminophen during pregnancy was associated with a 37% increased risk of the child being diagnosed with hyperkinetic disorder, a severe form of attention deficit hyperactivity disorder (ADHD)
- A 2019 study found that, compared to children of mothers with the lowest acetaminophen burden, children of mothers with the greatest exposure had a 286% higher risk for ADHD and a 362% higher risk for autism spectrum disorder (ASD) by the time they were about 9 years old
- Findings published in 2016 revealed use of acetaminophen at 18 and 32 weeks of pregnancy were associated with a 42% higher risk of conduct problems and a 31% higher risk of hyperactivity symptoms in the child
- Another 2016 investigation found children of both sexes whose mothers used acetaminophen during pregnancy were 41% more likely to present with ADHD symptoms at age 5. Boys were also more likely to have ASD

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Many view over-the-counter (OTC) drugs as safe because they don't require a prescription. Nothing could be further from the truth. Acetaminophen, for example, (also known as paracetamol and sold under the brand name Tylenol among others) is actually one of the more dangerous drugs you can get your hands on.

Despite statistics showing acetaminophen is the leading cause of acute liver failure in the U.S.,¹ most people don't think twice before downing those pills. Acetaminophen is also found in a wide variety of products designed to treat headache, fever and cold symptoms, as well as in prescription pain medications mixed with codeine or hydrocodone.² And, most households have more than one of the over-the-counter products, which could easily lead to overdosing.

Although it was initially hailed as a safe drug for pain, by 2013 lawsuits³ were piling up, citing 56,000 trips to the emergency room every year, all due to Tylenol causing liver and kidney failure.⁴ The grim truth is that as early as 2005 scientists already knew that "severe acetaminophen hepatotoxicity leads to acute liver failure."⁵

Not only that, reports also showed that unintentional overdoses accounted for hundreds of suicide attempts, deaths and liver transplants. Along that line, statistics from national database analyses in 2006⁶ showed that acetaminophen accounted for an estimated 56,000 emergency room visits and 26,000 hospitalizations annually. The average annual death toll from acetaminophen overdose was 458.

A number of studies have also linked acetaminophen use during pregnancy with lifelong repercussions for the child, raising their risk of developing conduct disorders, hyperactivity and autism.

Acetaminophen Use Linked to Hyperactivity in Offspring

In 2014, a study in the journal JAMA Pediatrics⁷ revealed that "Research data suggest that acetaminophen is a hormone disruptor, and abnormal hormonal exposures in pregnancy may influence fetal brain development." This is a significant concern, considering many pregnant women are likely to reach for an OTC pain reliever at some point during their pregnancy.

According to that 2014 study, use of acetaminophen during pregnancy was associated with a 37% increased risk of their child being diagnosed with hyperkinetic disorder, a severe form of attention deficit hyperactivity disorder (ADHD).

Their children were also 29% more likely to be prescribed ADHD medication by the time they were 7 years old. The strongest associations were observed in mothers who used acetaminophen in more than a single trimester, and the greater the frequency of use, the more likely their child was to experience behavioral problems. As reported by Forbes at the time:⁸

"Acetaminophen can cross the placenta, making its way to the fetus and its delicate developing nervous system. The drug is a known endocrine (hormone) disrupter, and has previously been linked to undescended testes in male infants.

Since the maternal hormone environment plays a critical role in the development of the fetus, the authors say that it's 'possible that acetaminophen may interrupt brain development by interfering with maternal hormones or via neurotoxicity such as the induction of oxidative stress that can cause neuronal death.'"

Similar findings were published in 2016. This study,⁹ also published in JAMA Pediatrics, found use of acetaminophen at 18 and 32 weeks of pregnancy was associated with a 42% higher risk of conduct problems and a 31% higher risk of hyperactivity symptoms in the child.

When the mother used acetaminophen at 32 weeks of pregnancy, the child also had a 29% higher risk of having emotional problems and a 46% higher risk of "total difficulties."

Tylenol in Pregnancy May Double or Triple Risk of Autism

A study^{10,11,12} published online October 30, 2019, in JAMA Psychiatry further strengthens the link between acetaminophen use and ADHD, while also noting an increased risk for autism spectrum disorder (ASD). According to the authors:¹³

"Prior studies have raised concern about maternal acetaminophen use during pregnancy and increased risk of attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) in their children; however, most studies have relied on maternal self-report ...

In this cohort study of 996 mother-infant dyads from the Boston Birth Cohort, cord plasma biomarkers of fetal exposure to acetaminophen were associated with significantly increased risk of childhood attention-deficit/hyperactivity disorder and autism spectrum disorder."

Compared to children of mothers with the lowest acetaminophen burden (first tertile, based on cord plasma biomarkers for acetaminophen), children of those in the second tertile had a 226% higher risk of being diagnosed with ADHD, and a 214% higher risk for an ASD diagnosis by the time they were about 10 years old (average age 9.8 years).

Those with the greatest (third tertile) acetaminophen burden had a 286% higher risk for ADHD and a 362% higher risk for ASD. As noted by the authors,¹⁴ their findings "support previous studies regarding the association between prenatal and perinatal acetaminophen exposure and childhood neurodevelopmental risk."

More Evidence Against Taking Acetaminophen During Pregnancy

In addition to the studies already mentioned, a number of others have also documented this disturbing link between acetaminophen use during pregnancy and neurological problems in the children. Among them:

- A 2013 study¹⁵ published in the International Journal of Epidemiology found "children exposed to [acetaminophen] for more than 28 days during pregnancy had poorer gross motor development, communication, externalizing behavior,

internalizing behavior and higher activity levels" than unexposed children at age 3. Use of ibuprofen was not associated with these neurodevelopmental effects.

- A 2016 Spanish investigation^{16,17} published in the International Journal of Epidemiology found children of both sexes whose mothers used acetaminophen during pregnancy were 41% more likely to present with ADHD symptoms at age 5. Boys were also more likely to have ASD. As noted by the authors:

"Prenatal acetaminophen exposure was associated with a greater number of autism spectrum symptoms in males and showed adverse effects on attention-related outcomes for both genders. These associations seem to be dependent on the frequency of exposure."

Aside from a higher risk of neurodevelopmental problems, studies have also shown:

- Use of acetaminophen during pregnancy may increase your risk of pre-eclampsia and thromboembolic diseases¹⁸
- Taking the drug for more than four weeks during pregnancy, especially during the first and second trimester, moderately increases the risk of undescended testicles in boys¹⁹
- Using acetaminophen in the third trimester increases your risk of preterm birth²⁰

Acetaminophen After Birth Also Linked to Autism

The use of acetaminophen after birth may also lead to problems. In fact, some argue the increased risk of autism we see following childhood vaccinations may in fact be due to the inappropriate use of acetaminophen after the shots are given — not the vaccines.²¹

In my view, it seems irrational to give toxic injections a free pass, but acetaminophen administration could certainly make matters worse. A small preliminary study²² published in 2008 concluded "acetaminophen use after measles-mumps-rubella vaccination was associated with autistic disorder."

Debunkers of the vaccine-autism connection point to statistics showing that, in the early 1980s, when the autism trend began its precipitously steep incline, vaccines were not only being added to the vaccination schedule, but pediatricians were also told to start using acetaminophen instead of aspirin, as aspirin had been linked to Reye's syndrome.²³

A 2017 study²⁴ even claims "The use of acetaminophen in babies and young children may be much more strongly associated with autism than its use during pregnancy, perhaps because of well-known deficiencies in the metabolic breakdown of pharmaceuticals during early development."

While parents give babies and infants Tylenol for numerous reasons, one instance in which Tylenol is routinely used is after childhood vaccinations, and according to research²⁵ published in the journal Lancet in 2009, acetaminophen might actually render vaccinations less effective when administered together, which is yet another reason to avoid giving acetaminophen to your baby.

Infants who received acetaminophen right after getting a vaccination experienced lowered immune response, developing significantly fewer antibodies against the disease they were vaccinated against.

The vaccines used in the study were for pneumococcal disease, Haemophilus influenzae type b (Hib), diphtheria, tetanus, whooping cough, hepatitis B, polio and rotavirus. The authors concluded that:

"Although febrile reactions significantly decreased, prophylactic administration of antipyretic drugs at the time of vaccination should not be routinely recommended since antibody responses to several vaccine antigens were reduced."

Understand the Risks Associated With Acetaminophen

Pregnant women are not the only ones that need to be careful in their use of this common pain reliever and fever reducer. Acetaminophen overdose is responsible for nearly half of all acute liver failure cases in the U.S.,²⁶ and its use has also been linked to three serious skin reactions; two of which typically require hospitalization and can be fatal.

These problems can happen to anyone. A major problem is that while acetaminophen is considered safe when taken as recommended, the margin between a safe dose and a potentially lethal one is very small.

Provided you have a healthy liver and do not consume more than three alcoholic beverages a day, the recommended oral dose of acetaminophen is up to 1,000 milligrams (mg) every four to six hours, not to exceed 3 grams (3,000 mg) per day.²⁷ As noted by U.S. San Diego Health:²⁸

"To appreciate how easy it is to exceed the safe limit, consider that one extra strength Tylenol tablet contains 500 mg of acetaminophen. Take two tablets at a single dose three times a day and you are at the maximum recommended dose."

If you then inadvertently consume an acetaminophen-containing allergy medication or cold medication in addition, you risk damaging your liver ... The key is to be aware of how much acetaminophen you are consuming."

What's more, research²⁹ has shown taking just a little more than the recommended dose over the course of several days or weeks (referred to as "staggered overdosing") can be riskier than taking one large overdose. So, in summary, please be aware that your risk of severe liver injury and/or death increases if you:

- Take more than one regular strength (325 mg) acetaminophen when combined with a narcotic analgesic like codeine or hydrocodone.
- Take more than the prescribed dose of an acetaminophen-containing product in a 24-hour period.
- Take more than one acetaminophen-containing product at the same time — Make sure to read the list of ingredients on any other over-the-counter (OTC) or prescription drug you take in combination.
- Drink alcohol while taking an acetaminophen product — Research^{30,31} suggests acetaminophen increases your risk of kidney damage by 123% if taken with alcohol, even if the amount of alcohol is small.

Why You Should Keep NAC in Your Medicine Cabinet

Given their health risks, I generally do not recommend using acetaminophen-containing drugs for minor aches and pains. There are many other ways to address acute and chronic pain that do not involve taking a medication. For a long list of pain-relieving alternatives, please see this previous article.

That said, pain relievers like acetaminophen do have their place. Post-surgical pain, for example, or other severe pain may warrant its temporary use. For those instances, I recommend taking it along with N-acetyl cysteine (NAC), which is the rate-limiting nutrient for the formation of the intracellular antioxidant glutathione.

It is believed that the liver damage acetaminophen causes is largely due to the fact that it can deplete glutathione, an antioxidant compound secreted by your liver in response to toxic exposure. Glutathione also helps protect your cells from free radical damage.

NAC is the standard of care in cases of acetaminophen overdose, approved in 1985 by the FDA as an antidote for acetaminophen toxicity.³² Mortality due to acetaminophen toxicity has been shown to be virtually eliminated when NAC is promptly administered. So, whether you are taking Tylenol in prescription or over-the-counter form, I strongly suggest taking NAC along with it.

Keep in mind, however, that there's no data showing whether taking NAC would ameliorate the autism or ADHD risk for pregnant women, so if you're pregnant, I would recommend just avoiding acetaminophen. If you absolutely need an OTC pain reliever, ibuprofen appears to be a safer choice. The same caveat for lack of data goes for infants.

Tips for a More Toxin-Free Pregnancy

I believe it's imperative to be aware of, and abstain from, as many potential neurotoxins as possible during pregnancy to protect the health of your child. Our environment is saturated with such a wide variety of toxins, and you may not be able to defend yourself against each and every one of them, but you do have a great degree of control within your own immediate household.

The food and drinks you ingest, and the household, personal care and medical products you opt to use during pregnancy can have a distinct impact on your child's development and long-term health.

ADHD and autism have both skyrocketed in prevalence the past few decades, signaling that something is going terribly wrong. Our environment is becoming overly toxic, and children are paying the price for our chemical-laden lifestyles. OTC drugs like acetaminophen are part of this toxic burden that infants have to contend with.

- ¹ [Mayo Clinic, Acute Liver Failure](#)
- ² [DrugWatch.com](#)
- ³ [Drug Watch July 23, 2020](#)
- ⁴ [Hepatology. 2004 Jul;40\(1\):6-9. doi: 10.1002/hep.20293](#)
- ⁵ [Hepatology November 29, 2005](#)
- ⁶ [Pharmacoepidemiol Drug Saf. 2006 Jun;15\(6\):398-405](#)
- ⁷ [JAMA Pediatrics April 2014](#)
- ⁸ [Forbes February 24, 2014](#)
- ⁹ [JAMA Pediatrics 2016;170\(10\):964-970](#)
- ¹⁰ [JAMA Psychiatry October 30, 2019 DOI: 10.1001/jamapsychiatry.2019.3259](#)
- ¹¹ [Fox5 New York October 31, 2019](#)
- ¹² [Daily Mail October 30, 2019](#)
- ¹³ [JAMA Psychiatry October 30, 2019 DOI: 10.1001/jamapsychiatry.2019.3259, Abstract and Key Points](#)
- ¹⁴ [JAMA Psychiatry October 30, 2019 DOI: 10.1001/jamapsychiatry.2019.3259, Conclusions and Relevance](#)
- ¹⁵ [International Journal Of Epidemiology December 2013; 42\(6\): 1702-1713](#)
- ¹⁶ [International Journal of Epidemiology 2016 Dec 1;45\(6\):1987-1996](#)
- ¹⁷ [Medical News Today August 19, 2016](#)
- ¹⁸ [J Matern Fetal Neonatal Med. 2010 May;23\(5\):371-318](#)
- ¹⁹ [Epidemiology 2010 Nov;21\(6\):779-85](#)
- ²⁰ [International Journal of Epidemiology 2009; 38: 706-714 \(PDF\)](#)
- ^{21, 23} [Real Clear Investigations April 13, 2018](#)
- ²² [Autism 2008 May;12\(3\):293-307](#)
- ²⁴ [Int Med Res. 2017 Apr;45\(2\):407-438](#)
- ²⁵ [Lancet 2009 Oct 17;374\(9698\):1339-50](#)
- ²⁶ [Hepatology 2004 Jul;40\(1\):6-9](#)
- ^{27, 28} [US San Diego Health June 29, 2018](#)
- ²⁹ [British Journal of Clinical Pharmacology 2012 Feb;73\(2\):285-94](#)
- ³⁰ [Medical News Today November 4, 2013](#)
- ³¹ [141st annual American Public Health Association Meeting, Online Program](#)
- ³² [Guidelines for the Management of Acetaminophen Overdose \(PDF\)](#)
- ³³ [EWG Skin Deep Database](#)