

Acetaminophen and Autism – Is There a Link?

Recently, officials in the U.S. government have made claims that acetaminophen use during pregnancy may result in long-term neurological effects, such as autism in the exposed children born of these mothers. Such claims have sparked controversy and confusion throughout the nation, world and medical field.

The search strategy involved examining the articles and research supporting and refuting these claims using Google Scholar, Embase, PubMed, and examining recent responses from organizations, such as the U.S. Food and Drug Administration (FDA) and the official website of the White House.

The official website of the White House has referenced studies and trials to support these claims. Two large-scale cohort studies, the Nurses' Health Study II and the Boston Birth Cohort, were referenced that found associations between acetaminophen use during pregnancy and later diagnoses of autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD).^{1,2} While the Nurses' Health Study II focused only on ADHD in 8,856 children, the Boston Birth Cohort study considered both ASD and ADHD. Associated with John Hopkins University, the Boston Birth Cohort had 996 participants with 66 of those having ASD only, 257 with ADHD only, and 42 with both ASD and ADHD. The study analyzed acetaminophen metabolites found in the fetal cord blood of the babies during their births. They found that cord biomarkers of acetaminophen exposure to fetuses were associated with a significant risk of childhood ASD and ADHD. The limitations listed included that they were only 1-time measurements at birth, and since the half-life of acetaminophen in adults is less than 3 hours, the data can only apply to maternal use of acetaminophen during the peripartum period near birth rather than acetaminophen use throughout the entire pregnancy.²

The White House website also specifically states that “scientists have proposed biological mechanisms linking prenatal acetaminophen exposure to altered brain development and adverse birth outcomes.” The article referenced to this statement discussed the association of acetaminophen measured in meconium, or the earliest stool passed by a newborn infant, with adverse birth outcomes.³ While this study showed an association with decreased birthweight, decreased gestational age, and decreased odds of large for gestational age, the study found no association with preterm birth or any other pregnancy complications nor provided any data regarding brain development.

The main article for the U.S. government's claim appears to be based on a systematic review from Mount Sinai that was published in August 2025 and was recently supported by Harvard

University. The review used Navigation Guide methodology on scientific literature to identify 46 studies related to prenatal acetaminophen exposure and neurodevelopmental disorders (NDDs). Among those studies, eight discussed autism, while the rest were regarding ADHD or other NDDs. All eight were observational studies and totaled roughly 2.6 million participants, with seven being prospective cohort studies and one being a case-control study. From these autism studies, the systematic review noted that five found significant associations between acetaminophen and autism, two showed no associations, while one had mixed results. After analyzing each study, the review rated each study using numerical values to grade them on the basis of bias and strength of evidence for different criteria defined by the Navigation Guide methodology to conclude that there was strong evidence of an association between prenatal acetaminophen use and risk of ASD. The review also acknowledges that more research may be needed to confirm the association and determine causality. They do suggest that causality may be plausible due to the concept that over time, acetaminophen has been the primary pain reliever for women who are pregnant as the rates of ADHD and ASD have increased over 20-fold in the past decades, even in the context of improved diagnostics. The review does note the benefits of acetaminophen, as untreated maternal fever and pain may have risks such as neural tube defects and preterm birth. The review advocates for using acetaminophen at the lowest effective dose and shortest duration, weighing the risks and benefits.⁴ One conflict of interest is that one of the authors of the systematic review, Harvard dean Dr. Andrea Baccarelli was paid \$150,000 in 2023 to testify against Tylenol's (trade name of acetaminophen) manufacturer in an expert witness case.

A Swedish study conducted in 2024 examined around 2.5 million children using a sibling-control design, where one sibling had prenatal exposure to acetaminophen while another in the same family did not. After adjusting for confounding variables, the study found no statistically significant association between prenatal acetaminophen exposure and autism (HR, 0.98 [95% CI, 0.93 to 1.04]; RD, 0.02% [95% CI, -0.14% to 0.18%]).⁵ The Mount Sinai systematic review referenced by the White House had also included the unadjusted data of this study in its analysis, that included the estimated 2.5 million children, where confounding variables were not accounted for, which thereby may skew the results in favor of an association.⁴ Another article included in its analysis was the Boston Birth Cohort study.

There were three other studies that found a positive association between prenatal acetaminophen use and autism that were analyzed by the Mount Sinai systematic review. One was a meta-analysis that examined six European population-based birth cohorts, totaling 73,881 participants. The study found that children with prenatal acetaminophen exposure were 19% more likely to develop symptoms of autism when compared with non-exposed children (OR = 1.19, 95% CI 1.07 to 1.33).⁶ Another was also a prospective cohort study that analyzed over 2,000 children, where males with prenatal acetaminophen exposure had statistically significant positive Children Asperger Syndrome Test (CAST) scores, indicative of autistic symptoms ($\beta = 0.63$, 95% CI 0.09 to 1.18). However, females had statistically significant negative CAST scores ($\beta = -0.51$, 95% CI -0.98 to -0.05). When both genders were taken together, the CAST scores were not statistically significant ($\beta = 0.08$, 95% CI -0.28 to 0.44).⁷ The last study with a positive association was a prospective cohort study with 64,322 children. Prenatal acetaminophen exposure was associated with an increase in autism that was accompanied by hyperkinetic symptoms (HR = 1.51, 95% CI 1.19 to 1.92), but no association was found with other cases of autism (HR = 1.06, 95% CI 0.92 to 1.24).⁸ A common limitation noted across these studies included the presence of residual confounding variables that were unable to be filtered, such as

genetics. All three studies focused on the association found between prenatal acetaminophen exposure and autism, but do not state any causality between them.

Although these articles have claimed a positive association between prenatal acetaminophen exposure and autism, other articles have expressed no association between them.^{5,9,10} In fact, a recent meta-analysis from 2025 analyzed 12 studies that totaled more than 3 million participants, regarding prenatal exposure to acetaminophen and autism, and suggested that many with positive associations had biases, including difficulties in adjusting for a variety of confounders. When the meta-analysis controlled for unobserved familial confounding via sibling analysis, the associations found previously significantly weakened. That finding may suggest that the residual confounding variables of shared genetic and environmental factors may be responsible for the positive associations found in the original studies.¹⁰

In response to the recent claim made by the U.S. President, the FDA has initiated changes to the safety labeling of acetaminophen to acknowledge an increased risk of NDD in children born to pregnant women who use acetaminophen. The FDA commissioner stated that acetaminophen use is based on the parents' choice, taking precautions with low-grade fevers that may resolve without treatment, while using acetaminophen in certain scenarios. The FDA does advocate that causality has not been established between prenatal acetaminophen and NDDs and that acetaminophen is the only over-the-counter (OTC) medication approved to use for fevers during pregnancy.¹¹

The American Pharmacists Association (APhA) claims that no new evidence in the past two decades have shown that acetaminophen use in pregnancy causes autism.¹² The American College of Obstetricians and Gynecologists (ACOG) has also made a similar statement and even noted the limitations of the systematic review referenced by the Administration, saying there was a lack of control for confounding variables and the presence of unreliable self-reported data.¹³ The American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP) and the World Health Organization (WHO) are also in agreement that acetaminophen does not cause autism.^{14,15,16}

Summary:

Most of these studies investigating a link between acetaminophen use in pregnancy and autism are observational studies, where they may show associations between two variables, but the findings do not establish causality between them. The presence of confounding variables, such as genetics, fever, stress, and other medications, prevents assessment of causality and may be difficult to be filtered out completely in studies, limiting the application of observational studies in regards to causality. Therefore, the claim that prenatal acetaminophen exposure causes autism appears to be inappropriate at this time. Although some articles have found a positive association, limitations have been identified, and there are other studies that have shown no association. Regardless, the risk of untreated fever and pain is still present with pregnancy, and the benefits of acetaminophen use in those scenarios have been shown and advocated by various health organizations. Thus, shared decision-making between patients and their healthcare providers may be essential with use of acetaminophen at the lowest effective dose for the shortest necessary duration in women who are pregnant. A general precaution still applies that no medication should be taken during pregnancy without justification.

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- Carl Sagan, 1934 - 1996 (American astronomer and planetary scientist)

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