A Retrospective Review of Jigsaw Diagnostics' Data Found No Strong Signal Linking Tylenol Use to Autism, and a Moderate Association to Cat Litter Exposure

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Introduction

Jigsaw Diagnostics is a telehealth psychology practice providing virtual clinical diagnostic evaluations for autism spectrum disorder and related neurodevelopmental conditions. Operating since 2021, we have evaluated over 3000 children, helping them access crucial interventions sooner than most in-person evaluation clinics. Families are typically seen within weeks instead of the 6-9 month or even years' long waitlists for in-person testing.

Autism spectrum disorder is a neurodevelopmental condition defined by difficulties in social communication and repetitive/restricted behaviors. There is a range of symptoms and severity. Earlier interventions can help autistic children develop great strengths with the continued need for therapies, assistance, and accommodations varying greatly.

There is no single cause of autism. Both genetics and environmental factors may play a role. In part due to the recent increased national attention on the potential association between Tylenol and autism, Jigsaw Diagnostics took a retrospective review of about 2000 of its evaluations to look at several key prenatal factors. Namely, we looked at mother's exposure to environmental toxins, such as lead[7], nicotine[4,5], and cat litter[3,9]; mother's use of medications, including acetaminophen[1,6] and antidepressants[2,8]; and age of parents at time of conception[10].

This review is purely descriptive and does not have the power or statistical controls to provide evidence for any causal statements related to autism spectrum disorder.

Methods

In this clinically referred sample, 83% were diagnosed with autism and 17% with a different neurodevelopmental disorder. 70% were male and 30% female. The average age of first concern for the child's development was about 2 ½ years old. Dads on average were 31 years old at the time of the child's conception, and moms were 28 years old.

A comprehensive statistical analysis was performed to study the correlation of several demographic factors and prenatal exposures with a childhood autism diagnosis in this sample.

Multiple approaches were used, including both standard multivariate logistic regression and mixed effects logistic regression to account for individual differences and relevant covariates.

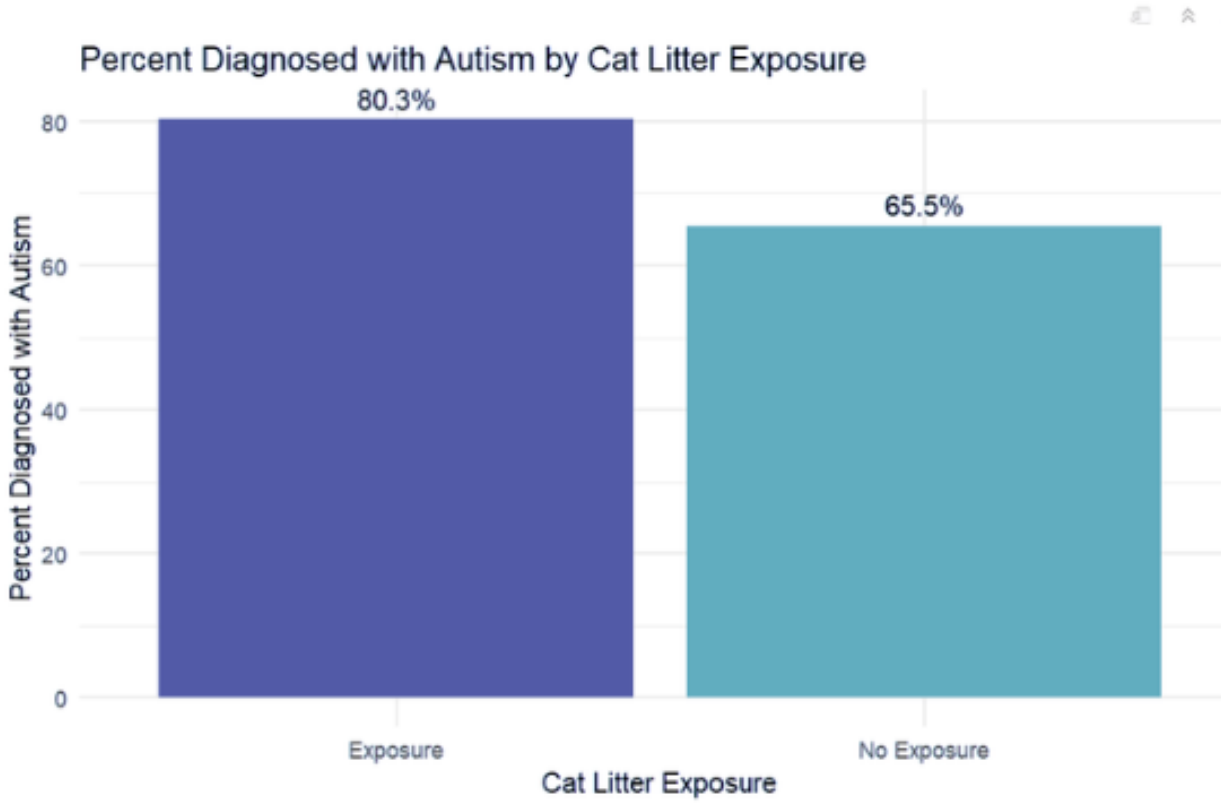
Results/Discussion

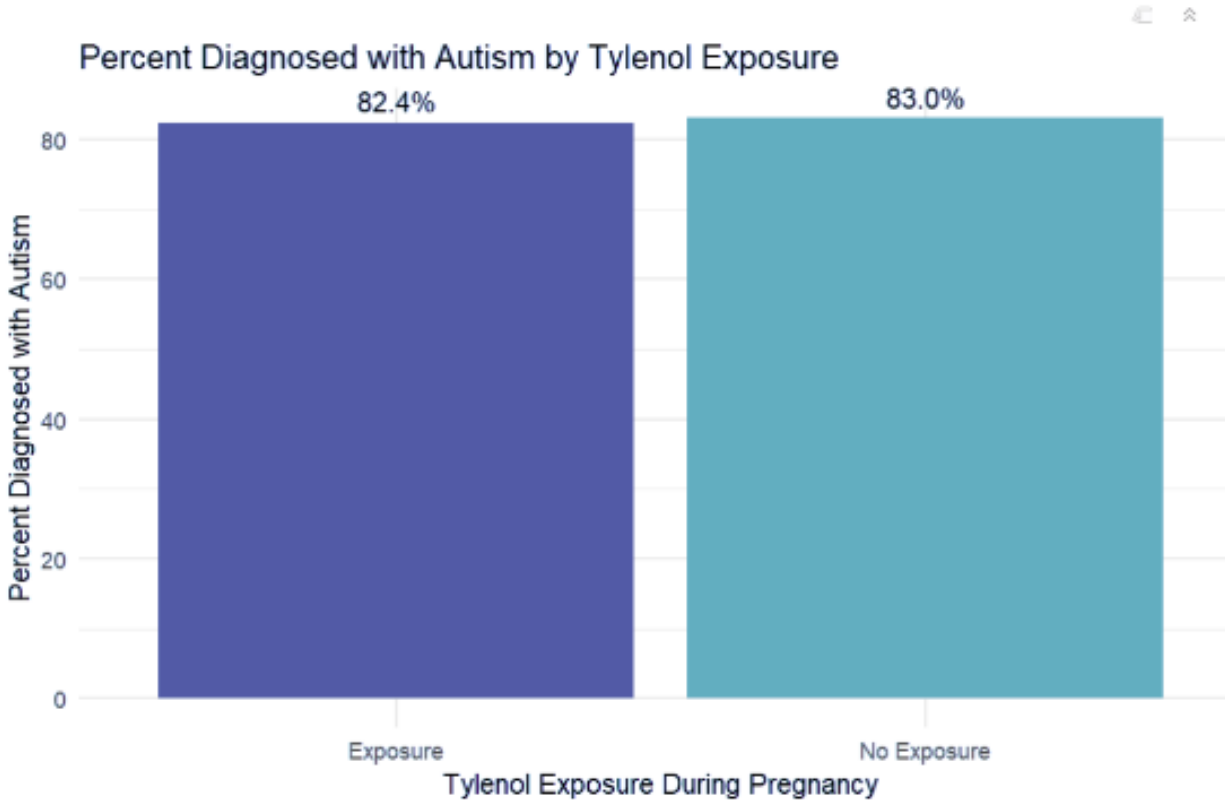
Among the variables examined, mother's exposure to cat litter during pregnancy emerged as the only statistically significant predictor ($p = 0.01$). Despite this association reaching statistical significance, it's important to mention that this analysis is not evidence of a large effect size. Essentially, cat litter exposure was correlated with a less than two-fold increase in the odds of diagnosis in our sample. In all, this indicates that exposure to cat litter alone is not a robust predictor of autism diagnosis. It is important to also emphasize that although logistic regression can unveil associations, it cannot determine causation nor constitute evidence of a large effect. Additionally, the potential biases in referral patterns and self-report also limit potential causal interpretation.

Cat litter exposure raises the risk that pregnant people may come into contact with a parasite commonly found in cat feces (*toxoplasma gondii*). If exposure happens during pregnancy (toxoplasmosis) there is a risk of potential fetal neurodevelopmental problems. No direct causal link between toxoplasmosis and autism has been firmly established, but multiple studies have found associations that raise the concern for developmental/behavioral/medical difficulties[3,9]. As such, individuals who may become or are pregnant are typically advised to avoid changing cat litter/protecting hands with gloves, and washing hands thoroughly.

Unlike claims made by Health & Human Secretary Robert F. Kennedy Jr. in the fall of 2025, our data can not conclusively rule in the possibility that Tylenol/acetaminophen plays a role in the development of autism spectrum disorder. Major medical organizations, including the American College of Obstetricians and Gynecologists (ACOG) and the World Health Organization (WHO), support the safety of Tylenol when used as directed during pregnancy. Our analysis remains descriptive and was not designed to determine causality. Given the complicated interplay of environmental, biological, and genetic factors in neurodevelopment, we cannot confirm or exclude any single variable, including acetaminophen, as a cause of ASD.

Jigsaw Diagnostics supports continued ongoing rigorous scientific research into both the causes as well as the best interventions and supports for autistic individuals across their lifespans. Moreover, according to the US Department of Health and Human services, maternal and infant health remains a substantial concern in the United States. Beyond the safety and efficacy of Tylenol for pregnant people, improved prenatal care is greatly needed, especially in communities where health disparities remain such as that of rural and in communities of color. It is crucial that pregnant individuals have access to accurate information, social support, and preventative resources; since a path to better outcomes lies in combining compassionate support with a commitment to equitable high-quality research. Empowering families, advancing autism science, and prioritizing maternal and infant health must be shared priorities on the journey toward a healthier future for all.


Percent Diagnosed with Autism by Cat Litter Exposure
80.3%
65.5%
Percent Diagnosed with Autism
80
60
40
20
0
Exposure
No Exposure
Cat Litter Exposure


Percent Diagnosed with Autism by Tylenol Exposure
82.4%
83.0%
Percent Diagnosed with Autism
80
60
40
20
0
Exposure
No Exposure
Tylenol Exposure During Pregnancy

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Coefficients:
                    Estimate Std. Error z value Pr(>|z|)
(Intercept)          0.53491    0.93589   0.572  0.56762
Tylenol             -0.04462    0.13116  -0.340  0.73368
Antidepressants     12.99944  333.26638   0.039  0.96889
Smoked               0.39131    1.06654   0.367  0.71370
Lead                 0.15482    0.77330   0.200  0.84132
CatLitter            0.91844    0.35570   2.582  0.00982 **
mom_age_years       -0.02509    0.01546  -1.623  0.10460
dad_age_years        0.02439    0.01313   1.858  0.06323 .
delivery_weeks       0.02285    0.02239   1.020  0.30756
biological_sexMale   0.10735    0.13465   0.797  0.42530
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
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