



Vaccines Do Not Cause Autism

Key points:

- **Dozens of well-designed studies including millions of children have shown no link between vaccinations, the MMR vaccine specifically or any vaccine components and autism or autism spectrum disorder (ASD), other neurologic disorders or allergic or autoimmune diseases.**

The Source of the concern of Vaccines Causing Autism

The 1998 *Lancet* study by Andrew Wakefield and others first reported an association between the MMR vaccine and autism.

- The study was a case series of 12 children with pervasive developmental disorder, eight had autism. The study suggested the intestinal inflammation caused by the MMR vaccine led to the autism.
- There were serious methodological flaws and misrepresentation of the data ultimately leading to retraction of the paper in 2010.
 - No control group
 - Relied on parental report of the child's receipt of MMR vaccine prior to the autism diagnosis
 - All eight children with autism developed intestinal symptoms after the diagnosis of autism, which was inconsistent with postulated mechanism.

The Lack of Association between the MMR Vaccine and Autism

A population-based study evaluating the association between MMR vaccination and autism¹

- Retrospective study of all children born in Denmark 1991 to 1998.
- The study included 537,303 children (representing 2,129,864 person-years)
- 316 children with a diagnosis of autistic disorder and 422 with a diagnosis of other autistic-spectrum disorders.
- **This study provides strong arguments AGAINST a causal relation between MMR vaccination and autism.**
 - **The results were derived from a nationwide Danish cohort study of over 500,000 children with nearly complete follow-up data.**
 - **The risk of autism was similar in MMR vaccinated and unvaccinated children, in both age-adjusted and fully adjusted analyses.**



- **There was no temporal clustering of cases of autism at any time after immunization.**
- **Neither autistic disorder nor other autistic-spectrum disorders were associated with MMR vaccination.**

Second population-based study evaluating the association between MMR vaccination and autism²

- The study included 657,461 children born in Denmark from 1999 to 2010 (representing 5,025,754 person-years). Non-overlapping cohort to prior study.
- 6517 children were diagnosed with autism (rate, 129.7 per 100,000 person-years).
- Evaluated the risk for autism after MMR vaccination in subgroups of children defined according to environmental and familial autism risk factors.
- **In this national cohort study including over 650,000 children comparing MMR-vaccinated with MMR-unvaccinated children, there was no association between MMR vaccination and autism.**
- **There was no increased risk for autism after MMR vaccination in the subgroups.**
 - **Sibling history of autism**
 - **Autism risk factors (based on a disease risk score)**
 - **Other childhood vaccinations**
 - **Specified time periods after vaccination**

Large US study evaluating the occurrence of autism based on MMR vaccine status in children with older siblings with and without autism³

- This was a retrospective cohort using an administrative claims database and included children enrolled in the health plan from birth to 5 years of age during 2001-2012 who also had an older sibling continuously enrolled for at least 6 months between 1997 and 2012. The exposure was receipt of MMR vaccine, and the outcome was the diagnosis of ASD.
- The study included 95,727 children with an older sibling. Of those, 1% were diagnosed with ASD and 2% had an older sibling with ASD.
- Children diagnosed with ASD were more likely to have an older sibling with ASD (6.9%) vs having an older sibling without ASD (0.9%).
- **The receipt of one or two doses of MMR vaccine was not associated with the diagnosis of ASD at any age regardless of whether the older sibling had ASD.**



Cochrane systematic review evaluating the effectiveness and safety of the MMR vaccine⁴

- The review included five randomized controlled trials (RCTs), one controlled clinical trial (CCT), 27 cohort studies, 17 case-control studies, five time-series trials, one case cross-over trial, two ecological studies, six self-controlled case series studies.
- In total the review included about 14,700,000 children.
- **In a Cochrane Database systematic review including 64 studies using multiple methodologies representing 14.7 million children, the review found no association between MMR vaccine and autism, other neurologic diseases, or allergic or autoimmune diseases.**

No Relationship Between Vaccines and Autism

Meta-analysis evaluating the association between vaccines and autism or ASD⁵

- The meta-analysis included five cohort studies involving 1,256,407 children and five case-control studies involving 9,920 children.
- The cohort data revealed no relationship between
 - Vaccination and autism (OR: 0.99; 95% CI: 0.92- 1.06)
 - Vaccination and ASD (OR: 0.91; 95% CI: 0.68 to 1.20)
 - MMR and autism (OR: 0.84; 95% CI: 0.70 to 1.01)
 - Thimerosal and autism (OR: 1.00; 95% CI: 0.77 to 1.31)
 - Mercury (Hg) and autism (OR: 1.00; 95% CI: 0.93 to 1.07)
- The case-control data found no evidence for increased risk of developing autism or ASD following MMR, Hg, or thimerosal exposure when
 - Grouped by condition (OR: 0.90, 95% CI: 0.83 to 0.98; p=0.02)
 - Grouped by exposure type (OR: 0.85, 95% CI: 0.76 to 0.95; p=0.01)
- **In a meta-analysis including 5 cohort studies and 5 case-control studies (over 1.2 million children), there was no relationship between autism or ASD and vaccination, MMR vaccine specifically, thimerosal, or mercury.**

The information contained herein should not be used as a substitute for a physician's independent judgement as to appropriate medical care and treatment. There may be variations in treatment that are recommended based on individual facts and circumstances.



References

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