



Aluminum in Vaccines Not Linked to Chronic Childhood Disorders: Danish Study

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Early childhood vaccines containing aluminum are not linked to a higher risk for developing autoimmune, allergic, or neurodevelopmental disorders, according to a nationwide study of Danish children.

The study, which looked at more than 1.2 million children over 24 years, provides additional evidence supporting the safety of aluminum-adsorbed vaccines, said senior author Anders Peter Hviid, MSc, DMSc, of Statens Serum Institut in Copenhagen.

“Our results provide robust evidence to help parents make the right decisions about the health of their children and for clinicians and public health officials to communicate about the excellent safety of the childhood vaccines,” Hviid told *Medscape Medical News*. “It’s understandable that more and more parents are concerned about vaccine safety, given the mixed messages that they receive currently. We hope that our study can help settle the issue on this particular concern.”

Aluminum adjuvants have been used in non-live vaccines to boost immune response for nearly a century. While years of research have demonstrated the safety of these adjuvants, concerns about potential risk remain. Robert F. Kennedy Jr, secretary of the US Department of Health and Human Services, [has blamed](#) exposure to aluminum in vaccines for

widespread allergies, and one of his close associates has [petitioned regulators](#) to halt distribution of certain vaccines until the makers of those shots provide more information about the amount of the metal in their products.

Findings from animal studies have mostly driven concerns about aluminum in vaccines, Hviid and his colleagues wrote; however, a [2022 study](#) looking at more than 326,000 US children did find a positive association between vaccine-associated aluminum and [asthma](#).

“I think it's fair to say that in part our study was inspired by that report,” said Hviid, whose group published the findings July 14 in [*Annals of Internal Medicine*](#).

Linking Vaccination Records to Outcomes

Researchers included 1.24 million children born in Denmark from 1997 to 2018. Eligibility required survival to age 2 years without congenital or preexisting conditions, including congenital [rubella](#) syndrome, respiratory disease, primary immune deficiency, or heart or liver failure.

Researchers obtained vaccination information from Denmark's National Health Service Register and, for each child, calculated the total aluminum exposure by age 2. Since 1997, the Danish childhood vaccination program has offered an aluminum-containing vaccine against [diphtheria](#), [tetanus](#), acellular [pertussis](#), poliovirus, and Haemophilus influenzae type b (Pentavac) in three doses at 3, 5, and 12 months. Since 2007, the program also offers an aluminum-adsorbed pneumococcal conjugate vaccine, also given in three doses in the first year of life.

Researchers then tracked patient outcomes from age 2 to age 5 (or until Dec 31, 2020), looking for diagnoses of 50 chronic autoimmune, atopic or allergic, and neurodevelopmental disorders — including juvenile arthritis, asthma, and [autism](#) spectrum disorders.

The median cumulative aluminum exposure for the cohort was 3 mg, with a range from 0 mg to 4.5 mg. Only 15,237 children received no aluminum-containing vaccines during the study period.

Excluding Risk ‘With Great Certainty’

The analysis found no relationship between cumulative exposure to aluminum in vaccines and any of the 50 selected conditions. For any autoimmune disorder, the adjusted hazard ratio (aHR) per 1 mg of aluminum exposure was 0.98 (95% CI, 0.94-1.02). The aHR was 0.99 (95% CI, 0.98-1.01) for any atopic or allergic outcome and 0.93 (95% CI, 0.90-0.97) for any neurodevelopmental outcome.

The most observed conditions during the study period were asthma (28,346 cases) and [atopic dermatitis](#) (22,978 cases). The researchers found no association between either condition and cumulative exposure to aluminum in vaccines.

“For some of the key outcomes that people are most interested in, like asthma and autism spectrum disorders, the results are quite clear, and we can exclude meaningful increases in risk with great certainty,” Hviid said.

Some of these associations even demonstrated a slightly decreased risk — for example, autism spectrum disorders; however, with confidence intervals close to one, “we don't interpret this as relevant protective effects,” he said.

Secondary analyses that extended follow-up to 8 years of age, removed all children with no exposure to aluminum-containing vaccines, and restricted the analysis to complete cases also found no association between these chronic

conditions and exposure to vaccines containing aluminum.

“With all these adjustments, they still didn’t find any differential in the effect. I think all of that is very reassuring,” said James Campbell, MD, MS, a professor in the Department of Pediatrics at the University of Maryland School of Medicine in Baltimore.

This paper “adds to the long history of studies” on the safety of aluminum-containing vaccines, said Campbell, who also is vice chair of the committee on infectious diseases for the American Academy of Pediatrics.

“Aluminum salts have been around for almost 100 years as an adjuvant; we have such a long history of using them, both in the United States and across the world,” Campbell told *Medscape*. “The aggregate of the data are that aluminum salt adjuvants are safe to be given to children.”

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Credits

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