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Communication

Neurodevelopmental Disease Associated with Aluminum-Absorbed Vaccines: A Nationwide Cohort Study

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Abstract

Andersson et al. published "Aluminum-Adsorbed Vaccines and Chronic Diseases in Childhood: A Nationwide Cohort Study" with a discussion and conclusion that contradicts the data. Aluminum adjuvant safety studies are largely underwhelming, irrelevant to injectable aluminum, and are not designed to discover neurodevelopmental disease. The manuscript matches the original supplemental, where many neurodevelopmental diagnoses were deleted, but not the updated supplemental showing association to neurodevelopmental disease. Neurodevelopmental disorders such as Asperger's syndrome, other pervasive developmental diseases, autistic disorder, and autism spectrum disorder are all found to be statistically significantly associated with a higher vaccine-derived aluminum cumulative dose.

Keywords: aluminum; vaccination; vaccine; neurodevelopmental; autistic; autism; autism spectrum disorder; asperger's syndrome

Introduction

Aluminum salts have been used in human vaccines as early as 1932 [1]. Along with other ingredients (e.g. thimerosal) that predated regulatory processes, it bypassed safety regulations and was grandfathered into modern use. The study of aluminum adjuvant safety is largely underwhelming.

Mitkus et al.[2] is highly cited as a study demonstrating aluminum adjuvant safety. It is not a study, it is a theoretical model of equations based on many assumptions. It derived a minimum risk level (MRL) of aluminum from the Agency for Toxic Substances and Disease Registry publication "Toxicological Profile of Aluminum"[3]. Mitkus et al. derives an MRL from the oral consumption of aluminum, even though the document clearly states "[d]ata on health effects of ingested aluminum in humans are unsuitable for MRL consideration". Mitkus et al. converts oral consumption levels to sera aluminum levels based on a study of 8 human adult males[4]. Mitkus at al. considers the conversion rate to aluminum citrate from aluminum hydroxide and aluminum phosphate adjuvants based on a study of only two rabbits each[5], where roughly 1% was deposited in the brain. The human clearance of aluminum is then assessed from a single human adult male[6], where roughly 4% persisted 1,178 days post-injection.

Movsas et al.[7] is an often cited aluminum safety study and includes 15 pre-term infants. The authors measured elemental concentration in the blood before vaccination and afterwards. They reported the percent increase or decrease of iron, manganese, selenium, zinc, and copper. They failed to report the one measured value for aluminum (the only element named in their title), stating merely that there was "[n]o significant change in levels of urinary or serum aluminum were seen after vaccination". Given that the infants had an already high blood aluminum level (11.1 ng/mL) and large variance (standard deviation of 10.3), the aluminum level in the blood would need to double for a statistical significant difference to be detected.

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Karwowski et al.[8] is also an often cited aluminum safety study, and includes a large sample size of 85 individuals measured for aluminum content in the hair and blood and neurodevelopmentally assessed. However, the authors exclude one child as an extreme outlier 5-times median value of aluminum in the hair sample, who also scored below the 25th percentile on gross motor. They also exclude 8 children as extreme outliers of blood samples. A study that excludes 9.4% of the study population cannot be considered as informative of the correlation between aluminum concentrations and neurological development.

All aforementioned studies were cited as the standard of aluminum safety by Andersson et al.[9], "Aluminum-Adsorbed Vaccines and Chronic Diseases in Childhood: A Nationwide Cohort Study".

Daley et al.[10] is a Center for Disease Control and Prevention publication, and utilized the Vaccine Safety Datalink to assess cumulative childhood aluminum dose via vaccination in relation to eczema (atopic dermatitis) and asthma. They conclude that per 1mg increase of aluminum, the risk of asthma in children without eczema increases by 19% (aHR 1.19, 95% CI 1.14, 1.25) and with eczema increases by 26% (aHR 1.26, 95% CI 1.07, 1.49).

Andersson et al.

The study evaluated 1,384,357 children live-born in Denmark between 1997 and 2018. It excluded 160,181 children for various reasons including 34,547 children (2.5%) who were documented with an "implausible number of vaccines" [more than 3 of any one aluminum adjuvanted vaccine]. A total of 1,224,176 children were included in the study, though for any particular outcome, between 0 and 466,047 were excluded for documentation of the outcome in the first 2 years of life [Figure 1]. Of the included cohort: 15,237 received no aluminum-absorbed vaccines; 42,990 received >0mg-1.5mg cumulative aluminum dose; 701,571 received >1.5mg-3mg cumulative aluminum dose; 464,378 received >3mg-4.5mg cumulative aluminum dose. A total of 1,209,939 children received at least some aluminum dose in this cohort study.

The study's claim is that "[t]his nationwide cohort study did not find evidence supporting an increased risk for autoimmune, atopic or allergic, or neurodevelopmental disorders associated with early childhood exposure to aluminum-adsorbed vaccines."

In fact, the study's analysis [Figure 3] supports claims that aluminum-absorbed vaccines are protective against 12 disease states: ulcerative colitis aHR 0.72 (0.52-0.98); erythema nodosum aHR 0.74 (0.58-0.95); asthma aHR 0.96 (0.94-0.98); angioedema and urticaria aHR 0.90 (0.86-0.95); allergy unspecified aHR 0.86 (0.80-0.92); anaphylaxis or epinephrine autoinjector aHR 0.84 (0.78-0.91); food allergy aHR 0.84 (0.79-0.89); neurodevelopmental outcomes aHR 0.93 (0.90-0.97); autistic disorder aHR 0.94 (0.89-0.99); autism spectrum disorder composite aHR 0.93 (0.89-0.97); attention deficit-hyperactivity disorder aHR 0.90 (0.84-0.96); other pervasive developmental disorders 0.89 (0.83-0.95).

In other words, the authors are at least 95% confident that an increase in exposure of 1 mg aluminum via aluminum-absorbed vaccines administered in the first two years of life will reduce disease outcomes between 2 and 5 years old. A reduced risk of: ulcerative colitis by 38.9%; erythema nodosum by 35.1%; asthma by 4.2%; angioedema and urticaria by 11.1%; allergy unspecified by 16.3%; anaphylaxis or epinephrine autoinjector by 19.0%; food allergy by 19.0%; neurodevelopmental outcomes by 7.5%; autistic disorder by 6.4%; autism spectrum disorder composite by 7.5%; attention deficit-hyperactivity disorder by 11.1%; other pervasive developmental disorders by 12.4%.

Original Supplemental Material

The original supplemental material posted with the article on July 15th represented all of the 5,174 diagnoses for autoimmune outcomes, all of the 39,465 diagnoses for atopic and allergic outcomes, but less than half (43.1%) of the 5,200 diagnoses for neurodevelopmental outcomes. Merely 2,239 diagnoses were represented. It was likely a deletion of diagnoses and not individual

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children as a whole, because the case count for all other disease categories remained unchanged. That is, if the 2,961 children were deleted in whole, then none of them had any autoimmune or allergic or atopic disease.

Importantly, the deleted neurodevelopmental diagnoses were not deleted at random, as one would expect from a random mistake. Had it been a random deletion, the deleted diagnoses in the parts would be comparable to the deleted diagnoses of the whole. On the whole, the original supplemental material saw a 56.9% reduction in neurodevelopmental outcomes (5,200 was reduced to 2,239). In its parts, the reductions were: 82.3% reduction in asperger syndrome (175 was reduced to 31); 59.1% reduction in atypical autism (276 was reduced to 113); 47.3% reduction in attention-deficit/hyperactivity disorder (1,580 was reduced to 832); 73.2% reduction in other pervasive developmental disorders (1,702 was reduced to 457); 58.4% reduction in autistic disorder (2686 was reduced to 1,118); 64.5% reduction in autism spectrum disorder composite (4,806 was reduced to 1,705).

Additionally, neurodevelopmental outcome is defined as a composite of both ADHD and ASD. We can compute how many children have both. Derived from Figure 3, 1,580 have ADHD and 4,806 have ASD. A total of 6,386 diagnoses in 5,200 neurodevelopmental outcomes means 1,186 children (22.8%) have both. In the Supplementary Figure 7 however, 832 have ADHD and 1705 have ASD from (the total for that figure), 2,239 neurodevelopmental outcomes means 298 children (13.3%) have both. If the diagnoses were deleted at random, the percentage of children with overlapping ADHD and ASD diagnoses would be comparable. They are not. It appears that children's diagnoses with the more extreme disposition were excluded from this supplement.

Though the study never intended to, and never did, analyze a zero-exposure group, such an unadjusted analysis is possible. Supplemental Figure 5 includes an analysis of only children exposed to some aluminum via vaccination (omitting the zero-exposure group), intended to show no significant difference with the inclusion or exclusion of the zero-exposure group. If we subtract the disease prevalence in Figure 5 from the disease prevalence of the main analysis, we are left with the disease prevalence of the zero-exposure group. Though a small cohort, it has significant outliers. Of atopic dermatitis diagnoses, 22,749 had some aluminum exposure and 229 had zero-exposure. Of allergic rhinoconjunctivitis, 22,649 had some aluminum exposure and 192 had zero-exposure. Of neurodevelopmental outcomes, 2,202 had some aluminum exposure and 37 had zero-exposure. Of the total cohort 1,208,939 had some aluminum exposure and 15,237 had zero-exposure. Odds ratios may be calculated from the resulting 2x2 matrix by many statistical software and web application programs (e.g. https://www.medcalc.org/calc/odds_ratio.php). The unexposed vs. exposed odds ratio for: atopic dermatitis is 0.796 (0.698-0.907, p-value=0.0006); for allergic rhinoconjunctivitis is 0.668 (0.579-0.771, p-value<0.0001); for neurodevelopmental outcomes is 1.334 (0.964-1.847, p-value=0.0825).

In other words, those children unvaccinated with an aluminum containing vaccine were 25.7% less likely to contract atopic dermatitis and 49.6% less likely to contract allergic rhinoconjunctivitis. They were also 33.4% more likely to have a neurodevelopmental disorder (with 92% confidence, not reaching 95% confidence, but still notable), a phenomenon with no known biological plausibility.

Updated Supplemental Material

On July 17th the publishing journal issued an erratum and presented updated supplemental material. According to the PDF file's metadata, the file was created on July 9th, 2025.

With the updated supplemental material, the signal for an association between the zero-exposure group and neurodevelopmental outcomes vanished. Of neurodevelopmental outcomes, 5,140 had some aluminum exposure and 60 had zero-exposure, yielding an odds ratio of 0.926 (0.718-1.195, p-value=0.554).

Statistical significant indicators for neurodevelopmental disease may be found in Supplemental Figure 4 for Asperger syndrome, aHR 1.67 (1.01, 2.77), per 1 mg increase in aluminum received through vaccines by age 2 for children born between 2007 and 2018. Asperger syndrome is also found

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to be significant in the risk difference comparison (>0mg-1.5mg compared to >3mg-4.5mg) of Supplemental Figure 11, 1.02 (1.38, 0.66) per 10,000 vaccinated. Supplemental Figure 11 also indicates statistically significant association of aluminum cumulative dose and neurodevelopmental disease risk difference.

Also in Supplemental Figure 11, comparing the risk difference of children who, in their first 2 years, received either >1.5mg-3mg or >3mg-4.5mg, the analysis finds an increased risk with increased aluminum dose of: overall neurodevelopmental outcomes of 9.73 (14.05, 5.41) per 10,000 vaccinated; other pervasive developmental disorders 3.74 (5.94, 1.55) per 10,000 vaccinated; autistic disorder 4.49 (7.24, 1.75) per 10,000 vaccinated; autism spectrum disorder composite 8.68 (12.38, 4.98) per 10,000 vaccinated.

There is additionally an unexplained and inexplicable change [gratitude to Dr. Suzanne Burdick for bringing it to our attention] in the difference between old and new supplemental material. The header "atopic and allergic outcomes" numbers change from old to new. They are different in Supplemental Figure 11 [risk difference], and not in Supplemental Figure 10 [risk difference compared to its reference group]. To change one and not the other is impossible. Additionally, Supplemental Figure 7 [describing age of diagnosis] changed and Supplemental Figure 4 [separating birth cohort] does not, which is highly unlikely. The changes appear only in the overall outcomes for the group, but not the individual parts of the group. This difference is possible if the parts of the group not reported (because they were too small - Supplemental Table 3) also changed, which they did not. Since the cumulative incidences change in Supplemental Figure 11, all tables that adjust for aluminum exposure must also change, but they didn't. Based on this discrepancy alone, it is necessary for the public to know what conditions were set for both versions of the supplemental material, which we do not.

Discussion

It is possible the primary motivation of this study was to counter the CDC's study's, Daley et al., finding that increased aluminum is associated with asthma and eczema (atopic dermatitis). In response to Daley et al, Dr. Paul Offit was interviewed by Voices for Vaccines[11], and during the interview he criticized Daley for not adjusting the data and showing the unadjusted data, "you're allowed to hide bad data, really, you're allowed to not be transparent about data that in no way informs the public about whether one thing is associated with another." Hiding data is what Andersson et al. did in an attempt (and failure) to show aluminum-absorbed vaccines are not associated with disease.

No one who studies vaccine injury would be surprised by immune system mediated diseases of atopic dermatitis and allergic rhinoconjunctivitis increased in the aluminum-based vaccinated group compared to the zero-exposure group. However, neurodevelopmental disorders more prevalent in the zero-exposure group have no biological plausibility.

The Andersson et al. manuscript, as written, comports with the original supplemental material, where the neurodevelopmental diagnoses of the sicker kids were deleted. The manuscript does not align with the updated supplemental material, where those diagnoses were included and yielded association between aluminum exposure and devastating neurodevelopmental disease.

Andersson et al., one of the largest aluminum-adjuvanted vaccine and autism studies ever created, is a flawed work with good supporting evidence of fraud. The study that claims it "did not find evidence" simultaneously presents evidence for the diseases it denies exists. The neurodevelopmental health of highest aluminum dosed children is significantly worse than the health of the moderate dose. That is a dose-response, not relative to zero-exposure but to moderate-exposure.

The international scientific community has called for its immediate retraction. We firmly agree that a retraction is in order. However, we do not believe this goes far enough. A retraction would certainly validate that the study was a product of poor execution. Also, under the guidelines[12] of the Committee on Publication Ethics (COPE), data fraud is a reason where "retraction might be

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warranted". However, retracting the paper is the easy way out for the reviewers, for the journal, and for the media that instantaneously promoted the false narrative without ever reading the paper. Blame for a retraction usually falls on the authors, but not just the authors were to blame for perpetuating the falsehoods.

The manuscript may be rewritten so that it is consistent with the data, though the Annals of Internal Medicine would never have published, and mainstream media would never have promoted, a study critical of vaccines. The editors of the journal may issue an apology to the subscribers and contributors, not for tarnishing their reputation, but for perpetuating the fallacy that vaccines are flawless.

Conclusions

Andersson et al. is a falsified study where the conclusion (that of no evidence of harm) does not match the analysis (with evidence of harm). Parents of the vaccine injured know all too well that there are some things that once done, cannot be undone. Andersson et al. has already injured, has already produced misinformed consent. The character of our duty to our children will be reflected in the manner and speed with which we correct our ways.

Conflicts of Interest: The authors declare no conflicts of interest.

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