

Aluminum and Vaccines

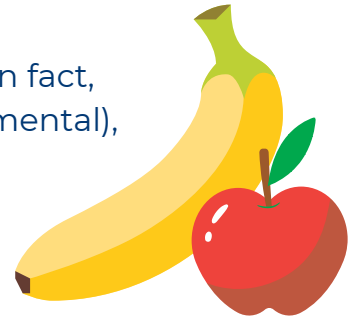
By Heather Simpson,
Back to the Vax

When I was anti-vaccine, one of the most prevalent myths being spread was that aluminum in some vaccines would enter the baby's brain through macrophages that sneak past the blood brain barrier (BBB) and cause a chain reaction of inflammation. This, in turn, would cause autism. It sounded scientific, and I didn't know how to dispute it.

This is one of the big dangers of anti-vaccine arguments – they sound extremely scientific and complicated, so they seem true! But, of course, just because something sounds complicated and scientifically correct, does not mean it is.

Fortunately, I finally did a little digging, and it blew my mind. When you can dispute false science with real science that makes sense, everything gets less scary. I was able to take this idea with me when I was still low-key freaked out on vaccination days.

The studies that many anti-vaxxers quote to prove this myth do, in fact, show aluminum (Al) in the brain...but they all show Al³⁺ (environmental), not aluminum salts – the type found in vaccines. That's a **MAJOR** difference. It's like comparing apples to bananas. They might both be fruits, but they are not the same.



In studies that show aluminum inside brain tissues/samples, go look at the Methods section. I can almost guarantee you that every one of them looked at Al³⁺ and not Al salts (E.g. aluminum hydroxide (Al(OH)₃), aluminium phosphate (AlPO₄) or aluminum hydroxide oxide (AlOOH). The main reason why they looked at Al³⁺ is because most of the Al salts will dissolve when in contact with water, like the table salt you dissolve in your boiling water when making pasta.

Furthermore, chemicals can only cross the blood brain barrier if they are fat soluble – meaning they can dissolve in fat or oils (e.g. alcohol, nicotine, caffeine). If they're not fat soluble, they likely can't cross it. Why does this matter? The aluminum in vaccines is not fat soluble. Which means it's not getting into your baby's brain at a rate or amount higher than the amount of aluminum your baby gets from food and drinks.

Need some more knockout facts? I did. I ate these up because they helped me feel confident about vaccinating.

Next, we have the fact that molecules that can pass the blood brain barrier have to be the right size and charge. Al salts found in vaccines (e.g. $\text{Al}(\text{OH})_3$, AlPO_4) are too large to pass the BBB.

Okay, but how did some of those studies find any form of aluminum in the brain at all? Yes, the studies didn't find vaccine aluminum in the brain, but what about other forms of aluminum? I also read that studies on strands of hair found aluminum in them. How is that a thing?

Al^{3+} can cross the BBB, as Al salts do dissolve and release their Al^{3+} over time, with an acidic environment (e.g. stomach juice) accelerating such dissolution. Hair isn't part of the brain, as skin/scalp is part of the integumentary system (skin) and not the brain. Hair follicles are naturally irrigated with blood and will incorporate chemicals found in blood as hair grows. Hence why hair is a great biological sample to determine if someone has been exposed to something in the past. Hair aluminum is always found as Al^{3+} (environmental) not aluminum (salt hydroxide/phosphate) (vaccines).

I talked to my scientist buddy who told me he wished chemicals were easier to get across the brain because it would be a medical breakthrough and so beneficial for different medical treatments, but it is so hard to get anything across the BBB, no matter how hard we try. He cited a study that determined only 5% of drugs and chemicals known to mankind are capable of crossing the BBB if they are small molecules. If you are talking about something much bigger (proteins such as vaccine antigens), their chance to cross the BBB is close to zero.

Bottom line? I'm not worried about aluminum in vaccines anymore.



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