

Summary of Aluminium in vaccines:

Aluminium is one of the most abundant elements on earth and has been used in vaccines for more than 70 years. An average daily exposure of aluminium is about 10-15 mg, most of which comes from foods. Humans and other mammals are constantly exposed to aluminium compounds and as a consequence aluminium is found in the blood of all humans and animals. Normally aluminium is excreted through the urine.

Aluminium is used in some vaccines as an adjuvant (something which helps stimulate and immune response.)

The roles of aluminium adjuvants in vaccines are:

1. To bring the antigen into contact with the immune system and influence the type of immunity produced including the quality.
2. To decrease the toxicity of certain antigens such as pertussis, diphtheria and tetanus
3. To provide solubility to some vaccine components

Were aluminium eliminated from vaccines there would be significant effects on these three issues. There are currently no obvious substitutes for aluminium as an adjuvant in vaccines.

Aluminium adjuvants have an established safety record with low incidence of reported adverse events. Minor reactions occur fairly often but there have been very few serious reactions. Reactions are more likely if the injection is delivered into the subcutaneous tissue rather than deep into the muscle.

There are abundant studies concerning risk levels for ingested aluminium and minimum risk levels have been set. The deposition of aluminium following intramuscular injections had not been studied until recently because the low dose did not cause detectable changes in the plasma concentration (which is about 5micrograms per litre). However with newer techniques miniscule concentrations can now be measured. Preliminary experiments have shown that aluminium adjuvants are dissolved by citrate that is present in the space between cells and then rapidly eliminated from the body. This rapid elimination may be responsible for the excellent safety record of these adjuvants. There appears to be little potential for toxicity with vaccine level exposures to aluminium. The amount of aluminium in MeNZB is well within international standards for vaccines. Aluminium administered via vaccination does not contribute significantly to the general exposure to aluminium in human and serum levels of aluminium.

Based on 70 years of experience, the use of aluminium adjuvants in vaccines has proven to be safe and effective.

References

- Lindblad, E. B. (2004). "Aluminium adjuvants--in retrospect and prospect." *Vaccine* **22**(27-28): 3658-3668.
Eickhoff, T. C. and M. Myers (2002). "Workshop summary - Aluminium in Vaccines." *Vaccine* **31**90: 1-4.