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The Toxic Impacts of Aluminium Contained in Paediatric Vaccines on the Human Nervous System

Administration of Aluminium to Neonatal Mice in Vaccine-relevant Amounts is Associated with Adverse Long Term Neurological Outcomes

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Our previous ***ecological studies of autism spectrum disorder (ASD) has demonstrated a correlation between increasing ASD rates and aluminium (Al) adjuvants in common use in paediatric vaccines in several Western countries.*** *The correlation between ASD rate and Al adjuvant amounts appears to be dose-dependent and satisfies 8 of 9 Hill criteria for causality.*

We have now sought to provide an animal model to explore potential behavioural phenotypes and central nervous system (CNS) alterations using subcutaneous injections of Al hydroxide in early postnatal CD-1 mice of both sexes. Injections of a "high" and "low" Al adjuvant levels were designed to correlate to either the U.S. or Scandinavian paediatric vaccine schedules vs. control saline-injected mice. Both male and female mice in the "high Al" group showed significant weight gains following treatment up to sacrifice at 6 months of age. Male mice in the "high Al" group showed significant changes in light–dark box tests and in various measures of behaviour in an open field. Female mice showed significant changes in the light–dark box at both doses, but no significant changes in open field behaviours. These current data implicate Al injected in early postnatal life in some CNS alterations that may be relevant for a better understanding of the aetiology of ASD.

Introduction

Aluminium (Al) is the most abundant metal and third most common element in the Earth's crust. Normally chemically bound to other elements, Al is not typically bioavailable and indeed seems to play no role in any known biochemistry of plants, animals or humans. In the last 150 years, however, Al, through human activities has become much more prevalent in the human environment. Notably, Al is widely used in industrial and material applications, is widely found in processed foods, is contained in various medicinal compounds, and can be used as a flocculant in water treatment. Because of such ubiquity, it is increasingly found in our bodies. Overall, we now live in what has been termed "The Aluminium Age".

For all of its positive properties as a material, **Al is also demonstrably toxic to biological systems, an observation that has been in the scientific literature for at least a century. Although Al may deleteriously impact various organ systems, some of its worst impacts may be on the nervous system.**

Some of the **toxic actions of Al on the nervous system include:** disruption of synaptic

activity, mis-folding of crucial proteins, promotion of oxidant stress, and increased permeability of the blood–brain barrier, to mention only a few of the more egregious impacts. In particular, Al has been implicated in Alzheimer's disease and animal models of the disease clearly demonstrate Al-induced cognitive deficits and pathologies. Al vaccine adjuvants, in use since the mid-1920s, have been shown to produce Lou Gehrig's-like motor phenotypes in mice and motor neuron degeneration. The neurotoxic effects of Al adjuvants have been discussed in previous publications by our group and by others. Additionally, Al in vaccines has been linked to the induction of autoimmune diseases. Recently, we compared the amount of Al in various national paediatric vaccine schedules with increasing rates of autism spectrum disorder (ASD) and found a significant correlation that appeared to be dose dependent. These ecological data satisfied 8 or 9 so-called Hill criteria for causality. Similar conclusions about a potential role of Al adjuvants in ASD have been discussed by other investigators. The above results led us to attempt to create an animal model of ASD based on early life administration of Al adjuvants by injection. The current manuscript describes the behavioural outcomes of this study. A future publication will address central nervous system (CNS) alterations. <<<snip>>>

Conclusions

Al salts are the most widely used adjuvants today and have been since the 1920s. The fact that they can trigger pathological immunological responses and a cascade of unwanted health effects has been relatively under-appreciated to date. Nevertheless, it is clear that the problem with vaccine-derived Al is three-fold: 1) it can persist in the body,2) it can trigger pathological immunological responses and 3) it can make its way into the CNS where it can drive further deleterious immuno-inflammatory and excitotoxic processes.

This paper reports only preliminary data on the adverse neurodevelopmental effects of early Al exposure in paediatric vaccine-relevant doses in an animal model and hence does not provide conclusive evidence on the hypothesized causative role of Al in autism. However, our current results are consistent with the existing evidence on the toxicology and pharmacokinetics of Al adjuvants which altogether strongly implicate these compounds as contributors to the rising prevalence of neuro-behavioural disorders in children. Given that autism has devastating consequences in a life of a child, and that currently in the developed world over 1% of children suffer from some form of ASD], it would seem wise to make efforts towards reducing infant exposure to Al from vaccines.

Notes:

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