Baby teeth study may help to prevent autism – one culprit could be lead

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A blog online at http://blogs.biomedcentral.com/on-biology/2018/10/10/environment-in-autism/ says (in part):
"A recent study [*Fetal and postnatal metal dysregulation in autism* by Manish Arora, Abraham Reichenberg, Charlotte Willfors, Christine Austin, Chris Gennings, Steve Berggren, Paul Lichtenstein, Henrik Anckarsäter, Kristiina Tammimies & Sven Bölte (2017)] used baby teeth to look at early life exposures to toxic metals. Baby teeth start to develop at the end of the first trimester, and form a new layer each day, similar to the rings in trees. These layers can capture traces of chemicals that the developing fetus is exposed to. The researchers measured toxic chemicals and nutritive elements in teeth from twin pairs where one twin had autism, and observed excess intake of several toxic chemicals, as well as deficiencies in nutritive elements early in life, before the diagnosis of autism.

"Such research can point towards possible biochemical pathways that are abnormal in brains of future children with autism, and if implemented in larger samples it could not only help to better understand how autism develops, but also prompt new treatments and perhaps even prevention strategies."

The study referred to (above) was of 32 pairs of twins aged between 8 and 12, whose baby teeth were analysed for heavy metals and essential minerals, and was published in *Nature* in June 2017. So I downloaded (free, from https://www.nature.com/articles/ncomms15493) the journal article and was particularly interested to read part of the abstract:

"[compared to their twin who does not have Autism Spectrum Disorder (ASD)] Cases [the child/twin with ASD] have reduced uptake of essential elements manganese and zinc, and higher uptake of the neurotoxin lead. Manganese and lead are also correlated with ASD severity and autistic traits. Our study suggests that metal toxicant uptake and essential element deficiency during specific developmental windows increases ASD risk and severity, supporting the hypothesis of systemic elemental dysregulation in ASD."

The discussion includes the following summary of earlier studies:

"Among the large number of possible environmental exposures, metal toxicants and essential elements have received some attention[9]. For example, one study that compared hair metal concentrations of ASD cases with literature reference values was suggestive of reduced zinc and magnesium and elevated levels of toxicants including lead[26]. Similarly, higher blood lead levels have been reported in ASD cases[11], but in those studies it is possible that the uptake of metal toxicants or nutritional deficiencies are a consequence of autism-related behaviours and do not necessarily reflect a causal exposure prior to the onset of autism symptoms[27]. Previous studies have used teeth from ASD cases to measure cumulative exposure to metals, but those studies ground whole teeth not taking advantage

of the incremental microstructure that provides detailed temporal information[28]. They found no significant differences in lead, zinc or manganese between cases and controls."