Fluoride's Harm to the Developing Brain: The Recent Science

by Chris Neurath, Research Director, Fluoride Alert Network, December 2019

"THE RIGHT TO SEARCH FOR TRUTH IMPLIES ALSO A DUTY: ONE MUST NOT CONCEAL ANY PART OF WHAT ONE HAS RECOGNIZED TO BE TRUE"

"Several experts equated the harm found from fluoride to that from childhood lead poisoning." (Green, 2019)

This past year (2019)

The past year has seen unprecedented new science from Canada and the USA showing fluoride harms the developing brain from exposures due primarily to artificial water fluoridation.

Two of the published studies found clear associations between water fluoridation and substantial loss of IQ, both from prenatal and infant exposures. Equally worrisome is a third study that found children in fluoridated areas have a 284% higher risk of ADHD compared to those in non-fluoridated areas. Finally, a fourth study found harm in adolescence as well, with altered sleep patterns. Three of these high-quality studies were funded by the US National Institute of Environmental Health Sciences.

The 'wave' began in 2017

This 'wave' of new studies actually started in 2017 with two mother-child cohort studies of IQ loss in Mexico [Valdez-Jimenez 2017 and Bashash 2017]. These two high-quality studies confirmed the evidence of fluoride's neurotoxicity that had been accumulating over 30 years in China, India, and elsewhere consisting of 60 human studies.

The high quality fluoride-IQ studies in 2017 were followed in 2018 with a study showing an association between fluoride and ADHD [Bashash 2018] and another showing an association between fluoride and reduced thyroid function (hypothyroidism) which was exacerbated by iodine deficiency [Malin 2018]. Hypothyroidism in pregnant women is a known cause of lowered IQ in their children.

The four studies published in 2019 are the strongest ever and are undeniably relevant to the levels of fluoridation [0.7 MG FLUORIDE/LITRE WATER] in the USA. I will discuss these in turn.

1) Green 2019: in JAMA *Pediatrics*. Substantial IQ loss in Canadian children from prenatal exposure to fluoride from water fluoridation.

This year's first major study was from a research group based in Canada and published in the prestigious journal *JAMA Pediatrics* [Green 2109]. It received widespread media coverage, with articles in The Washington Post, CNN, NPR, Time Magazine, etc. The editors of JAMA *Pediatrics* even went so far as to say that the study reversed their previous (mis)conception that fluoridation was perfectly safe and only crazy people claimed it could be neurotoxic. The editor-in-chief said if his wife were pregnant he would advise her to

avoid fluoridated water [JAMA Pediatrics Christakis podcast]. **Several experts equated the harm found from fluoride to that from childhood lead poisoning.**

2) **Riddell 2019: found almost 3 times higher risk of ADHD for those living in fluoridated areas in a national sample of Canadian children.**

This study, also from Canada, found a strong association between home water fluoride concentration and much higher risk of ADHD diagnoses in children [Riddell 2019]. The data came from a government sponsored nationwide survey of health and nutrition (Canadian Health Measures Survey). The study found that children living in areas with fluoridated water had a 284% higher risk of having a diagnosis of ADHD as those who lived in non-fluoridated areas. This study confirmed two previous studies linking fluoride to ADHD from Mexico and the USA [Bashash 2018, Malin 2015].

3) **Till 2020**: *(published ahead of print in Nov 2019)* **Children who were formula-fed and lived in fluoridated areas as babies have dramatically lower IQ compared to those who lived in non-fluoridated areas.**

This study is arguably the most worrisome finding yet. Till and co-workers found that formula-fed infants in fluoridated areas had much lower IQ than formula-fed infants in non-fluoridated areas.

Formula-fed babies (with most of the powdered formula reconstituted with tap water) in fluoridated areas averaged 4 IQ points lower compared to formula-fed babies in non-fluoridated areas. Tests of non-verbal IQ showed even more dramatic effects, with an average loss of 9 points in the non-verbal component of IQ tests. When translated to typical water fluoridation levels in the USA of 0.7 mg/L, the Till 2020 findings suggest a loss of non-verbal IQ of 13 points for infants in fluoridated areas compared to those with low levels of fluoride in the water. This study was in a carefully monitored cohort followed from before birth through age 4 years. The study authors controlled for many factors. When they also adjusted for mothers' fluoride exposure during the pregnancy, that only accounted for a small part of the IQ loss. Thus, infancy may be at least as susceptible a period for neurotoxic harm as the prenatal period and exposure during both developmental periods may produce additive harm. Not just pregnant women should be advised to avoid fluoridated water, their children should as well.

These three studies were all within Canada, where the average water fluoridation level is 0.6 mg/L, while the current average in the USA is 0.7 mg/L (and in some communities still up to 1.2 mg/L). These studies are also relevant to the USA because socio-economic and other factors in Canada are arguably as similar to the USA as can be found anywhere.

A fourth study, published just last week, bursts any remaining quibbles about relevance to the USA because it studied children in the USA [Malin 2019].

4) Malin 2019: Altered sleep patterns in adolescents linked to levels of fluoride in the drinking water in the USA.

This study used data from the rigorous, nationally representative, NHANES health and nutrition surveys conducted by the Centers for Disease Control (CDC). The authors found that in adolescents aged 16-19 years drinking fluoridated water, there was a doubling of symptoms indicative of sleep apnea, compared to those with low fluoride water. There were also significantly later bed times and waking times in the adolescents with higher water fluoride levels. The link between fluoride and sleep disturbances may be through fluoride's effect on the pineal gland. This gland, situated in the brain, regulates sleep-wake cycles through the hormone melatonin. The pineal gland accumulates high levels of fluoride, and previous studies in animals suggested fluoride may alter melatonin levels [Luke 1997]. Alteration of sleep patterns may be a neurotoxic effect of fluoride separate from the loss of IQ and increased risk of ADHD due to earlier life exposures.

It bears repeating that all four of these 2019 studies were performed in Canada or the USA where the majority of fluoride exposure comes from artificially fluoridated water. In other words, harm was found in children with average intakes of fluoride.

The oft-repeated claim of fluoridation proponents, that studies finding neurotoxic harm are only from areas with "irrelevant" high fluoride levels, can now be roundly dismissed.

"Just one study" !

Another criticism from fluoridation proponents that the JAMA *Pediatric's* study was "just one study" has been false for at least 30 years, since the first of now over 60 fluoride-IQ studies was published in China in the 1980s [FAN 67 IQ studies webpage]. Almost 15 years ago the US National Research Council's comprehensive review noted several human neurotoxicity studies and many animal studies as clear evidence that fluoride could harm the brain [NRC 2006].

Conclusion

The scientific evidence can now be considered overwhelming. This may be a big surprise to those were never aware of the many studies because they simply accepted the claim that fluoridation was "safe and effective". It may be a shock to fluoridation promoters who have tried to ignore or deny each accumulating piece of evidence. But the science is now undeniable. We don't know how long it will take for this truth to sink into mainstream science, medicine, and public health. It will likely take more hard work on the part of scientists conducting even more studies, and by individuals and groups like FAN reaching ordinary people and government officials.

An analogy to the history of "low-level" lead neurotoxicity can offer insights. Several experts have said that it now looks like fluoride poses a similar risk for the developing brain as lead poisoning. In fact, back when leading researchers first started voicing concern that "low-level" lead was causing neurobehavioral harm in children about 30 years ago, the existing scientific evidence to support that concern was weaker than what is now available for fluoride [Needleman 1990]. It took more than two decades for the Centers for Disease Control (CDC) to finally respond to the evidence on "low-level" lead and reduce the "level of concern" to the 5 ug/dL blood lead level it currently stands at. That delay might sound

discouraging, but the CDC's decision to reduce the "level of concern" followed just months after a 2012 NTP report that concluded even levels below 5 µg/dL posed a risk. With fluoride, we now have a draft NTP report, backed by evidence as strong as available when alarms were first being raised for "low level" lead.

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