

The Effect of Fluoride on the Level of Intelligence in Children

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Recently, many researchers and scholars have studied about the effects of the trace element, iodine, on the level of intelligence in children. However there has been little coverage or noise about the same effect of fluorine on children. For this purpose we have performed some research and the results are as follows.

1. Methodology and Content

A We have chosen our tokens of research based on elements with similar types of natural conditions. Regions with different combinations of chemicals detected have been used in the research, such as high fluoride high iodine, high fluoride low iodine, high fluoride with regular amount of iodine, low fluoride high iodine, low fluoride with low iodine, low fluoride and normal amount of iodine, low iodine and regular amount of fluoride, as well as research groups where the elements and their combinations are compared against each other. The research group has performed intelligence tests on selected groups of subjects between the ages of 8 to 14 years old.

B We have chosen intelligence tests formulated by Bient-Siman.

C We have also performed a study on the parents of the subjects, and looked into whether these parents have a certain level of education, or have provided pre-school education to their children.

2. Results

A Level of IQ: Please refer to Chart 1. The comparative results between regions with a high amount of fluoride are as follows: there is no difference between a region of high fluoride and iodine against one that only has a high level of fluoride ($P>0.05$); however there are major differences in results between a region of high fluoride and iodine, and one with a high level of fluoride and low iodine ($P<0.01$). For IQ levels within regions with a low amount of iodine, the results are as follows: there is no difference between a region of low fluoride and high iodine, and one that only has a low presence in fluoride ($P>0.05$); however there are major differences in results between a region of low iodine and fluoride, and one

Chart 1. Comparison of basic data between regions with disease occurrence against regions without any occurrence

Research points	Water fluoride (mg/l)	Water iodine (pg/l)	% occurrence of thyroid gland swelling	% occurrence of the Dental fluorosis	IQ (X +/- SD)	u
High fluoride high iodine	3.9	670	11.22	99.0	80.31 +/- 7.55	30
High fluoride	1.8	50	0	95.0	79.25 +/- 2.25	97
High-fluoride low iodine	2.0	0.9	30.07	97.2	69.40 +/- 20.40	29
Low fluoride high iodine	0.5	10000	22.4	45.0	81.25 +/- 0.92	32
Low fluoride	0.38	50	0.8	31.0	80.21 +/- 8.27	21
Low fluoride low iodine	0.5	0.7	45.0	12.0	76.42 +/- 7.12	27
Low iodine	0.8	0.8	10.6	89.0	75.17 +/- 14.16	62
Control group	0.8	50	0.03	40.0	83.83 +/- 9.10	32

that only has a low level of iodine ($P < 0.01$). As to comparisons between a region with low levels of iodine and fluoride against one that only has a low level of iodine, there is no difference in the results ($P > 0.05$).

There are, however, major differences in the results between a region of high fluoride and low iodine, one that has low fluoride and iodine, one that has only a low level of iodine, and their respective comparative groups ($P < 0.01$). There is no difference in the results between a region of high fluoride and iodine, one that has only a high level of fluoride, a region of low fluoride and high iodine, a region with a lower amount of fluoride presence, and their respective comparative groups ($P > 0.05$).

B Distribution of IQ (Levels): Please refer to Chart 2.

The number of children displaying a lower level of intelligence is much higher in regions containing a high amount of both fluoride and iodine, ones that solely contain a high level of fluoride, and regions with high levels of fluoride and low levels of iodine, in comparison against the comparative groups researched.

C Children who have been exposed to pre-school education and those who have not, as well as children whose parents are literate or not, have been examined. The results show that these factors translate into significant differences in the level of intelligence in children ($P < 0.01$), whereas no difference was seen in the

level of intelligence in children between a region of high fluoride presence and its comparative group. ($P > 0.05$)

3. Observations

A In regions where a high amount of both fluoride and iodine is present, incidents of thyroid swelling in its habitants could occur as a result, whereas this rarely occurs in regions with only a high presence of fluoride. A higher chance of one being affected by thyroid swelling is likewise more prevalent in regions containing a high amount of fluoride but low amount of iodine, and regions where a relatively lower amount of iodine is detected. We believe that in a region where the level of iodine is low, but fluoride is significantly elevated, the level of toxicity in thyroid swelling could increase.

B Results of IQ testing: the number of children whose level of intelligence is lower is significantly increased in regions of high fluoride/iodine, regions of high fluoride only, regions of high fluoride/low iodine, against their respective comparative groups. Little difference was detected in the results of high fluoride/iodine regions and regions where only a high amount of fluoride is detected. However, the results in these aforementioned regions in comparison against regions of high fluoride/low iodine are significantly different. This could be demonstrative of the fact that fluoride acts to increase the toxicity and worsen the occurrence of thyroid swelling.

Chart 2. Distribution of IQ levels between region(s) with disease occurrence against region(s) without any occurrence								
IQ	Comparative groups		Region(s) with high amounts of fluoride/iodine		Region(s) with high amounts of fluoride		Regions with high amounts of fluoride and little iodine	
	No. of subjects	%	No. of subjects	%	No. of subjects	%	No. of subjects	%
110 +	7	11.29	2	5.26	1	2.44	0	
90-109	22	35.48	12	31.58	13	31.71	21	26.92
80-89	22	35.48	10	26.32	15	36.59	28	35.90
70-79	10	16.13	10	26.32	9	21.95	18	23.08
Below 69	1	1.61	4	10.53	3	7.32	10	12.82
Total	62		38		41		78	

C When it comes to the parents' level of education, and the children's exposure (or lack thereof) to pre-school education, significant differences in the intelligence level in these young subjects are shown in both regions affected by thyroid swelling, and their comparative regions. This demonstrates that levels of IQ are not only affected by the amount of trace elements in the environment, but also by social factors such as the education of the subjects, the type of education and training they are exposed to, etc. These social factors most definitely play an important role in this type of research.

Bibliography

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Translated from Chinese into English by FoxTranslate, courtesy of the Fluoride Action Network (2012). For more translations of Chinese research on fluoride toxicity, see www.fluoridealert.org/researchers/translations/