Iodine supplementation markedly increases urinary excretion of fluoride and bromide - Letters to the Editor - Townsend Letter for Doctors and Patients. May 2003

While the debate continues, regarding benefits and adverse effects of fluoridation of our water supply and bromination of our food supply, what can one do to minimize the toxic effects of these 2 halides? One approach in decreasing the body burden of fluoride and bromide is orthoiodo-supplementation, that is iodine/iodide supplementation in daily amount for whole body sufficiency.

Null and Feldman wrote an excellent appraisal of the fluoride controversy in the last 3 issues of this journal. (1-3) Another halide with toxic effects on the thyroid gland and the central nervous system is bromide. (4-6) Daily doses of bromide as low as 1 mg/kg body weight/day resulted in goitrogenic and thyrotoxic effects in rats. (7) This amount is the acceptable daily intake (ADI) for bromide, as proposed by the FAQ/WHO Pesticides Committees. Based on studies in human volunteers and rats, Van Leeuven et al, suggested that the ADI should be 10 times lower. (7) So, the controversy about the safety of bromide continues.

Is there a practical and simple way to lower the body's burden of fluoride and bromide? It has been known for some time now that bromide competes with chloride in the extracellular space and that the total molar concentration of bromide plus chloride remains constant. (8) This concept has been used to decrease extracellular bromide levels by saline loading. However, the presence of bromide in the thyroid gland (9) and the central nervous system (10) suggests that there is another intracellular "pool" of bromide, not responding to chloride.

In the thyroid gland, bromide competes with iodide for uptake, oxydation and organification. (9,11 and vido infra)

Therefore, increasing iodide intake should lower bromide levels in the thyroid, preventing and reversing its thyrotoxic and goitrogenic effects. The same applies to fluoride. Galletti and Joyet (12) evaluated the effect of 5-10 mg fluoride on thyroid functions in hyperthyroid patients. Although fluoride inhibited the iodide-concentrating mechanism of the thyroid, fluoride did not accumulate in the thyroid. Based on their radioactive tracer studies, they concluded "Fluorine does not impair the capacity of the gland to synthesize thyroid hormones when there is an abundance of iodide in the blood." Therefore, fluoride toxicity depends on iodide supply.

Based on a review of previous studies, we have calculated the amount of iodine/iodide necessary for sufficiency of the whole human body. (13) This amount was equivalent to 2 drops of Lugol solution, containing 5 mg iodine and 7.5 mg iodide. We tested a solid dosage form containing 2 drops of Lugol per tablet, administered daily for 3 months in 10 healthy women. There was no adverse effects observed on urinalysis, hematology, blood chemistry, thyroid functions and ultrasound of the thyroid. (14)

In the process of developing an iodine/iodide-loading test to assess sufficiency of the whole human body, we measured the amount of the 4 halides in 24h urine collections in 3 male and 3 female subjects under baseline conditions, and following a single ingestion of one, two and three tablets of the preparation, and in 5 of the subjects following one month on 3 tablets/day. Urinary levels of fluoride, chloride, bromide and iodide were measured by the ion-selective electrode procedure. (15) Chloride levels were measured directly in urine samples, and the other 3 halides were measured following chromatography on anion exchange resin. There was a progressive increase in urinary levels of fluoride and bromide with increasing intake of the preparation. The highest urinary levels were observed following 3 tablets. These high levels persisted even after one month on 3 tablets. The table presents the results obtained in a male subject following a single dose of one, two and three tablets; and after one month on 3 tabl ets of this preparation.

He did not reach iodine sufficiency even after one month on 3 tablets/day. Based on the results of the loading test, the body is considered iodine sufficient when at least 90% of the oral amount is excreted in the 24h urine collection. Urinary iodine levels in this subject were 149.6 uM/24h or 19 mg/24h representing only 51% of the dose.

The baseline level of urinary fluoride was very low, but bromide concentration was 18.4 mg/24h, 3 times the ADI recommended by Van Leeuwen et al. (6) Following supplementation with the iodine/iodide preparation, there was a progressive increase in the excretion of fluoride and bromide. With 3 tablets, the 24h excretion of fluoride was 17.5 times baseline level; and for bromide, 18 times baseline level. These high levels persisted even after one month of supplementation at 3 tablets/day, being 15 times baseline level for fluoride, and 16 times for bromide. After one month, the estimated total amount of halide excreted was 24 mg fluoride and 8700mg bromide. It is unlikely that such large amounts of halides came from the thyroid gland. It would seem that the whole body is being detoxified. Orthoiodo-supplementation could be used under medical supervision to detoxify the body from unwanted halides in a manner similar to the use of EDTA for the detoxification of heavy metals.

The last national nutritional survey revealed that 15% of the US adult female population are iodine-deficient by the WHO standard, that is less than 0.05 mg/L urine. (16) Over the last 20 years, iodine was replaced with bromine in the bread making process. (13) The risk ratio for breast cancer 40 years ago was one in twenty and now one in eight. (17) It is of interest to note that breast tissue contains lactoperoxydase which is capable of oxydation and organification of iodide and bromide. The breast needs iodine for normal function and protection against breast cancer. (13) High bromide levels in breast tissue would compete with iodine, interfering with the cancer-protecting role of iodine in the breast.

The RDA for iodine is based on the amount of iodine/iodide needed to prevent goiter, cretinism and hypothyroidism. The optimal requirement of the whole human body for iodine has never been studied. Based on a review of published data, we previously proposed that an amount of iodine 100 times the RDA would be required for iodine sufficient of the whole human body. (13) This amount is equivalent to 2 drops of Lugol solution. We are pursuing further research on the use of the orthoiodo supplementation as a means of detoxification of fluoride and bromide; and for prevention and control of fibrocystic disease of the breast and breast cancer.

Reprint of the manuscripts describing the orthoiodo-supplementation, the iodine/iodide loading test and the technique for measuring urinary halide levels are available at no charge, upon request.

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Effect of increasing intake of an Iodine/Iodide supplement, on urinary excretion of halides in a male subject.

Supplementation*

Halide	Pre	1 Tab	2 Tab	3 Tab	3 Tab x 1Mo
Fluoride (uM/24h)	2.8	12.0	22.6	48.9	42
Chloride (mM/24h)	297	341	305	333	370
Bromide (uM/24h)	230	240	584	4188	3625
Iodide (uM/24h)	0.76	25	59	109	149.6
Molar Ratio					
Fluoride/Iodide	3.7	0.48	0.37	0.44	0.28
Bromide/Iodide	303	9.6	9.9	38.4	24.2
Chloride/Bromide	1291	1420	519	79	102.8

* 1 Tablet contains 7.5 mg of idoide as the potassium salt and 5 mg iodine.

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