The Iodine/Iodide Loading Test

Jorge D. Flechas, M.D.

I. Introduction

Orthoiodosupplementation is the daily amount of essential element iodine required for whole body sufficiency. Whole body sufficiency for iodine is assessed by an iodine/iodide loading test.1-3 The iodine/iodide loading test is based on the concept that the normally functioning human body has a mechanism to retain ingested iodine until whole body sufficiency for iodine achieved. During orthoiodosupplementation, a negative feedback mechanism is triggered that progressively adjusts the excretion of iodine to balance the intake. As the body iodine content increases, the percent of the iodine load retained decreases with a concomitant increase in the amount of iodide excreted in the 24 hour urine collection. When whole body sufficiency for iodine is achieved, the absorbed iodine/iodide is quantitatively excreted as iodide in the urine. Whole body sufficiency for iodine is arbitrarily defined as 90 percent or more of the ingested iodine/iodide load (50 mg) recovered in the hour urine collection.1

In some very rare cases of severe iodine cellular transport defect/damage, the absorbed iodine/iodide is quantitatively excre in the urine, even though the target organs are very iodine deficient. We have reported only three cases over the last three years.3,4 One case was studied in detail using post-iodine load serial serum iodide levels before and after supplementation with Vitamin C.4 The milder cases of iodide cellular uptake defect/damage are more difficult to detect. We are currently investigating the saliva iodide/serum iodide ratio as a means of assessing iodide cellular transport effectiveness.

In the only case of symporter defect/damage assessed by the saliva/serum iodide ratio so far5 this female patient had eleva serum fluoride levels (0.32 mg/L) compared to the normal range of 0.001 to 0.045 mg/L reported in the literature.6 This leve serum fluoride of 0.32 mg/L is observed in patients ingesting up to 10 mg per day.6 Prior to Vitamin C at 3 grams per day, tl saliva/serum ratio was 1.1 (saliva 0.081 mg/L and serum 0.073 mg/L) 24 hours after a load of 50 mg iodine (4 tablets Iodoral®). After one month on Vitamin C, 3 grams per day, and 4 tablets of Iodoral® per day, her saliva/serum ratio increas to 47 (saliva 7.1 mg/L and serum 0.15 mg/L) 24 hrs following the 50 mg iodine load. Her serum fluoride decreased to 0.13 mg/L.

In a previous issue of Vitamin Research News, the clinical response to orthoiodosupplementation was summarized, based data over the last 3 years from several physicians in several thousand of patients with various clinical conditions7 (Table 1). This presentation will focus on the loading test itself and the results obtained so far in the U.S. population at the laboratory. Preliminary results on 667 patients were previously reported8, with none of those patients reaching whole body sufficiency for iodine. We are now reporting data compiled on 4,065 patients covering a nationwide population.

Table I
Iodine deficiency may play an important role in the following clinical disorders:

1. Subclinical hypothyroidism
2. Grave's disease
3. Autoimmune thyroiditis
4. Thyroid nodules
5. Fibrocystic Disease and Cancer of the Breast
6. Polycystic Ovary Syndrome
7. Obesity
8. Diabetes (both types)

III. Interpretation of results and recommendations

The lab measures how much of the 50 mg load is excreted in the urine over a 24 hour period. An example here would be, if excretion is 5 mg over the 24 hour cycle, then the individual absorbed 45 mg in their body. The human body can hold up to 1500 mg.2 The largest quantities are present in fat tissue and striated muscle.3 The largest concentrations are in the thyroid, ovary, liver, lung, adrenal gland, and heart. Twenty percent is in the skin. Every organ evaluated contained significant amounts of inorganic iodine. Once whole body sufficiency is attained following orthoiodosupplementation1,3, 90 percent or more of the iodine load are excreted in the

urine. If a patient has not taken iodine in significant amounts prior to this test and the test shows greater than 90 percent excretion, one then needs to consider that this individual has a sodium/iodide symporter defect. We now have done over 7,(tests. A major symporter defect is detected in about every 2,000 tests. If this defect is present, special considerations must given to try and get the defect repaired. A complete nutritional program is recommended.1 We have previously reported improvement of a cellular transport defect for iodine following Vitamin C supplementation.4

IV. Data collected so far from the U.S. population

Out of 4,065 tests, less than 1 percent of patients excreted 90 percent or more of the load. About 83 percent of the patients were women and 17 percent were men. The mean iodide output in the 24 hour urine collection was 19.8 mg. In seven to eig percent of the patients evaluated, the amount of iodide excreted was less than 10 percent of the iodine/iodide load (8 perce of female patients and 7 percent male patients) (See Fig. 1 and 2). In men 1 in 682 attained 90 percent sufficiency while in women 1 in 337 did the same. As the patient's age increases, percent excretion decreased with a mean of 17.7 mg. (St. De 7.1)

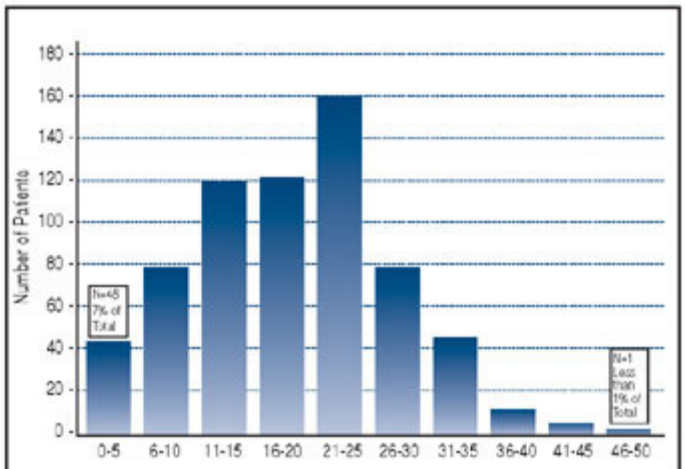

Fig. 1 Iodide measured in 24 hr Urine Collection in 682 male patients ages 6-87 following the loading test with 4 tablets Iodoral® (60 mg) (Mean: 19.72 Std Dev: 8.15)

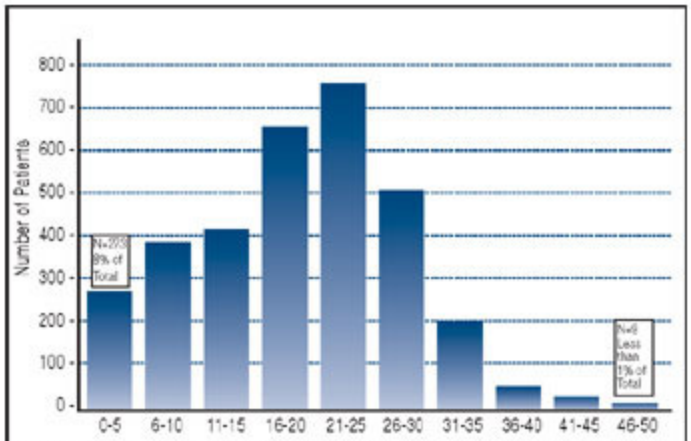

Fig. 2 Iodide measured in 24 hr Urine Collection in 3373 female patients ages 6-89 following the loading test with 4 tablets Iodoral® (60 mg) (Mean: 19.8, Std Dev: 7.7)

Recent studies have been reported showing a relationship of iodine deficiency during pregnancy and ADD.3 Based on the iodine loading test on 16 to 35-year-old females, we found that 18 percent had urine iodide output in a 24 hour urine of 10 percent or less, evidence of severe iodine deficiency.

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