

## IODINE - TRACE ELEMENT

### Introduction

Atomic mass 126.9. Iodine is required for thyroid hormone synthesis. Iodine deficiency has recently been recognised as a re-emerging problem in Australia. For instance, over 50% of New South Wales schoolchildren aged 8-10 years were identified as having at least mild iodine deficiency during the recent Australian National Iodine Nutrition Study. The re-emergence of iodine deficiency appears to be the result of the dairy industry no longer using iodine-based cleaners, a practice that inadvertently fortified milk with iodine. Furthermore, there has been a decline in the use of iodised salt in Australia.

### Exposure

Iodine is present in large quantities in drugs, antiseptics, contrast media and food preservatives.

### Pathology

The thyroid has a number of intrinsic regulatory mechanisms that maintain normal thyroid function even in the presence of iodine excess. However, dysfunction of these mechanisms can result in either hypothyroidism or hyperthyroidism in the setting of sudden iodine excess.

Iodine-induced hyperthyroidism has frequently been observed in patients with euthyroid iodine-deficient goitre. It has also been reported in euthyroid patients with previous thyroid disease, particularly Graves' disease treated with antithyroid drugs. Occasionally, it may occur in patients with no evidence of previous thyroid disease.

In contrast, there may be transient hypothyroidism following iodine excess. This has been described for a few apparently normal individuals, in neonates, in some patients with chronic systemic disease and in patients with previously treated thyroid disease.

Deficiency of iodine results in a spectrum of disorders including goitre, hypothyroidism, mental retardation, cretinism, and increased neonatal and infant mortality. Significantly, pregnant women have increased requirement for iodine and deficiency in this population is associated with adverse consequences for the mother and foetus. Therefore, some commentators propose iodine supplementation (150µg daily) for all Australian women who are pregnant, lactating or intending to become pregnant.

### Monitoring

Urinary iodine concentration (spot sample) reflects recent intake. This is very useful in assessing iodine status at a community level, but provides little insight into an individual's long-term iodine status. Serum iodine is of little utility.

Serum TSH analysis provides an indication of whether there is sufficient iodine to facilitate thyroid hormone synthesis.

### Analysis

Trace Elements analyses iodine using inductively coupled plasma mass spectrometry.

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