Selenium and iodine interactions with thyroid status

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Background: The adequacy of selenium (Se) status may influence iodine metabolism because of Se's role in the deiodinase enzymes. Se deficiency may exacerbate symptoms of iodine deficiency. There is little research on any detrimental effects of marginal selenium intakes on thyroid status.

Objective: This paper reports on two studies investigating (a) the relationship between Se status and thyroid status in a NZ population and (b) the effect of Se supplementation on TSH and the ratio of T_3/T_4.

Design: *Study 1*: Plasma Se was determined in 199 Otago residents for which data was available on thyroid volume, plasma TSH, and plasma T_4. *Study 2:* TSH, T_4 and T_3 were measured in plasma from two supplementation studies: 57 smokers who received 100 µg Se or a placebo daily as selenomethionine; 172 subjects who received 200 µg daily as high-Se yeast (Precise) or a placebo.

Outcomes: *Study 1:* In contrast to observations in France (1), preliminary analyses did not show significant associations between plasma Se and measures of thyroid status. *Study2:* Se supplementation resulted in a trend towards lower T_4 confirming an earlier study of a small but significant fall in T_4 (2).

Conclusions: Lack of association between plasma Se and thyroid status, and non-significant changes in T_4 suggest that Se status in NZ is adequate for optimal activity of the deiodinases

1. Derumeaux H, Valeix P, Castetbon K, Bensimon M, Boutron-Ruault M-C, et al. Association of selenium with thyroid volume and echostructure in 35-60-year-old French adults. Eur J Endocrinol 2003;148:309-315.
2. Duffield AJ, Thomson CD, Hill KE, Williams S. An estimation of selenium requirements for New Zealanders. Am. J. Clin. Nutr. 1999;70:896-903.