Serum Selenium Status in UK Graves' Disease Patients With and Without Orbitopathy

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Introduction

- Selenium supplementation is recommended for all patients with mild Graves' orbitopathy (GO).[1]
- The thyroid gland contains high levels of selenium, which has an anti-oxidant effect and a role in the metabolism of thyroid hormones.
- However, the study on which this recommendation is based was conducted in countries of a selenium-deficient region and did not measure subjects' selenium concentrations.[2]
- There is therefore no consensus on optimum dose, duration, or safety.
- Environmental selenium varies extensively between countries and no published studies report the baseline selenium status of UK GO patients.
- We aimed to determine baseline selenium status in a UK GO population and compare this to Graves' patients without GO.

Methods

- Baseline serum selenium status was measured in UK Graves' disease patients with and without orbitopathy between January – November 2021.

	Age (mean)	M:F ratio	Initial T3	Current or past smokers	Serum selenium (mean) (rr 0.76-1.46μmol/L)
GO (20)	46.6	4:16	10.96	10 (50%)	1.15 (range 0.8-1.93)
Non-GO (21)	46.3	5:16	13.25	6 (29%)	1.14 (range 0.5-1.78)

Table 1. *Demographics of the patients included in the study*

Results

- There were 41 patients; 20 had orbitopathy (16 females and 4 males, average age 46.6 years) and 21 did not (16 and 5, 46.3). The mean Clinical Activity Score (CAS) of the GO patients was 1.8.
- Average serum selenium was 1.14 (range 0.5- 1.93, reference range 0.76-1.46µmol/L); 1.15 in the GO group vs. 1.14 in the non-GO group.
- 4 patients had selenium levels above the normal range (1 GO and 3 non-GO), and 1 patient had a selenium level below the normal range (non-GO).
- There were 10 current or previous smokers in the GO group (50%) vs. 6 in the non-GO group (29%). Average selenium was 1.12 in never-smokers vs. 1.18 in current or past smokers.
- Selenium status rose incrementally with CAS, but the subgroups were too small to draw a meaningful conclusion.

Conclusions

- These results show that baseline selenium status in GO and non-GO patients is largely within the normal range.
- This suggests that selenium may have lesser benefit in the UK compared to regions with lower environmental selenium.
- Patients may also be at risk of iatrogenic overdose.
- A randomised control trial investigating the clinical effects of selenium supplementation in a UK GO population with concurrent measurement of selenium status is warranted.

[1] Bartalene L. et al. The 2021 European Group on Graves' orbitopathy (EUGOGA) clinical practice guidelines for the medical management of Graves' orbitopathy. European Journal of Endocrinology
[2] Marcocci C. et al. Selenium and the Course of Mild Graves' Orbitopathy (2011). N Engl J Med; 364:1920-1931.