

# Effect of selenium supplementation via Brazil nut (*Bertholletia excelsa*, H.B.K.) on thyroid hormones levels in hemodialysis patients: a pilot study

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## INTRODUCTION

Thyroid function depends on the essential trace mineral selenium (Se), being at the active center of the iodothyronine deiodinase that catalyzes the conversion of the thyroxine (T4) to the active form of thyroid hormone, triiodothyronine (T3). Hemodialysis (HD) patients have reduced T3 levels partly due to impaired hormonal conversion that can be related to selenium deficiency, a common feature in these patients.

## OBJECTIVES

The objective of this work was evaluated the effect of Brazil nuts (richest Se source) on thyroid hormone levels in HD patients.

## METHODS

This study evaluated the effect of Brazil nuts (richest Se source) on thyroid hormone levels in HD patients. We performed an uncontrolled intervention with 40 HD patients (53.3 ± 16.1 yrs, dialysis vintage 62.0 (8.0 - 207.0) months) that received one nut (≈5g, average 58.1 µg Se/g) per day for three months. Selenium levels were determined by atomic absorption spectrophotometry with hydride generation and, T3, free T4 (FT4), TSH as well as glutathione peroxidase (GPx) were measured by ELISA.

## RESULTS

All patients presented selenium deficiency (normal values: 60–120 µg/L) and after supplementation, the selenium plasma levels increased significantly in all patients. The GPx activity also increased significantly. At inclusion, all patients presented T3 levels below normal values and, these levels were increased significantly after supplementation (Table 1). The TSH levels were reduced, after supplementation, but not significantly. The Se levels before supplementation were correlated with T4 levels ( $r= 0.5$ ,  $p=0.04$ ). The patients completed the study and no side or adverse effects attributable to the intervention were reported.

**Table 1.** Assessment biochemical parameters before and after Brazil nut supplementation (N=40)

Parameters	Before Supplementation	After Supplementation
Plasma Se (µg/L)	17.6 ± 11.6	153.4 ± 86.1*
GPx (nmol/min/mL)	33.7 ± 5.9	41.4 ± 11.2*
T3 (ng/dL)	27.3 ± 8.8 (80-180)	50.2 ± 4.8*
Free T4 (ng/dL)	0.87 ± 0.2 (0,70 a 1,80)	0.98 ± 0.4*
TSH (uUI/mL)	2.17 ± 1.3 (0,5 a 5,0)	1.96 ± 1.1
FT4/T3 ratio	0.7 ± 0.1	0.2 ± 0.06*

\* $P<0.05$

## CONCLUSION

In conclusion, increasing Se levels via Brazil nut supplementation is associated with improvement in thyroid hormone levels in HD patients, although the amount of Se given was not able to restore T3 to normal levels.

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