

Is gluten free diet deficient in Selenium? A Prospective study in children with celiac disease

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ABSTRACT:

Wheat is a rich source of Selenium (Se). Dietary compliant celiac disease (CD) patients in disease remission may be prone to Se deficiency and its biological effects. Aim of the study were :1) Assess the absolute and functional deficiency of Se in gluten free diet (GFD) compliant CD children.2) Assess the sequential effect of oral Se supplementation and dietary modifications in those deficient. Asymptomatic CD children (<18 years) on compliant GFD ≥ 3 years in serological (anti-tissue transglutaminase antibody ≤ 3 times upper limit normal) and mucosal (Marsh grade <2) remission were included. Elemental Se (100 $\mu\text{g/day}$) for 3mo followed by Se-rich (>100 $\mu\text{g/day}$) modified GFD for next 3mo was given. Dietary selenium content (3 day recall), plasma Se levels, selenoprotein-P1 (SEPP1) and glutathione peroxidase-3 (GPX-3) were estimated at baseline. Se deficiency was defined as plasma Se levels <60 $\mu\text{g/L}$. Response in growth parameters, absolute and functional Se levels were reassessed at 3 and 6mo. Results: Of 77 screened, 51 CD [duration of compliant GFD 6(3-13) y; age at study enrolment 14(4.7-18) y] children were eligible for the study. Thyroid hypofunction and impaired glucose tolerance were seen in 21(41%) & 4(7.8%) children on baseline endocrine screen. All 51 patients were Se-deficient [plasma Se 34.5(19.3-53) $\mu\text{g/L}$]. Baseline dietary Se content [26.7(12-99) vs. 40.7(6.5-94) $\mu\text{g/d}$, $p = 0.009$], plasma Se [33.5(19.3-45.9) vs. 34.7(23.8-53) $\mu\text{g/L}$, $p = 0.4$], SEPP1 [3.1(2.2-5) vs. 3(1.9-4.4) $\mu\text{g/mL}$, $p = 0.7$], GPX3 [7.5(3.3-60.3) vs. 9.5(0.6-60.6) $\mu\text{g/mL}$, $p = 0.3$] were present in pure vegans (53%) and ovo/non-vegans (47%). Ten patients with irregular follow-up were excluded. Significant increase from baseline to 3mo was noted in SEPP-1 [3.0(2.1-5) vs. 3.9(2.4-8.3) $\mu\text{g/mL}$, $p = 0.02$] but not in GPX-3 levels [7.5(3.4-60.6) vs. 6.3(3.2-40.7) $\mu\text{g/mL}$; $p = 0.3$].

Conclusion from the study : GFD-compliant CD have absolute and functional Se deficiency. Short term therapy improves the Se status and growth parameters.

KEYWORDS: *Children, Celiac disease, Selenium, Gluten free diet*

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