Abstract

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Erythrocyte selenium concentration as a marker of selenium status.

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BACKGROUND & AIMS: Plasma selenium concentration and glutathione peroxidase (GPx) activity are commonly used as markers of selenium nutritional status. However, plasma selenium concentrations fall independently of selenium status during the acute phase response and GPx is analytically problematic. The assay for erythrocyte selenium is robust and concentrations are unaffected by the systemic inflammatory response. This study was performed to investigate the validity of erythrocyte selenium measurement in assessing selenium status.

METHODS: C-reactive protein (CRP), plasma and erythrocyte selenium concentrations and GPx activity were measured in 96 women from two regions of Malawi with low and high selenium dietary intakes. CRP and plasma and erythrocyte selenium was measured in 91 critically ill patients with a systemic inflammatory response.

RESULTS & CONCLUSIONS: The median CRP value of all subjects from Malawi was 4.2 mg/L indicating no inflammation. The median CRP value for the critically ill patients was 126 mg/L indicating this group was inflamed. In the non-inflamed population there was a strong positive correlation (r = 0.95) between erythrocyte and plasma selenium and a strong positive correlation (r = 0.77) between erythrocyte selenium and erythrocyte GPx up to 6.10 nmol/g Hb after which maximal activity was reached. In the inflamed population, plasma selenium was low, erythrocyte selenium was normal and there was a weak correlation (r = 0.30) between selenium concentrations in plasma and erythrocytes. This demonstrates that plasma selenium is affected by the inflammatory response while erythrocyte selenium concentration is unaffected and can be used to reliably assess selenium status across a wide range of selenium intakes.

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