

# Abstract

Am J Clin Nutr. 2002 Dec;76(6):1358-66.

## Low plasma concentrations of retinol and alpha-tocopherol in hematopoietic stem cell transplant recipients: the effect of mucositis and the risk of infection.

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**BACKGROUND:** Although vitamin deficiencies are rare in the United States, acute reductions in concentrations of plasma retinol (vitamin A) or alpha-tocopherol (vitamin E) have been associated with impaired immune responses in some clinical settings.

**OBJECTIVE:** The objectives were to determine the plasma concentrations of retinol and alpha-tocopherol in patients undergoing dose-intensive therapy and hematopoietic stem cell transplant and to examine the association of plasma concentrations with clinical outcomes reflecting immunity.

**DESIGN:** This was an observational trial of 120 consecutive recipients of hematopoietic stem cell transplant and a multivariate analysis of plasma vitamin concentrations, mucositis, infections in the first 30 d, and herpes zoster infections in the first year after hematopoietic stem cell transplant.

**RESULTS:** Plasma retinol and alpha-tocopherol concentrations declined from baseline to day 7, typically recovering without specific replacement toward baseline by day 14. The severity of mucositis was a strong predictor of low plasma retinol on day 7 ( $P = 0.001$ ). Eighty-two patients (68%) had at least one plasma retinol concentration  $\leq 1.05$   $\mu\text{mol/L}$ , a concentration previously determined to be of immunologic significance, during the peritransplant period (day -8 to day 14). Men more frequently acquired herpes zoster than women, and men who developed hyporetinolemia ( $\leq 1.05$   $\mu\text{mol/L}$ ) had a significantly higher risk of herpes zoster (OR: 6.6; 95% CI: 1.5, 29.6). Plasma alpha-tocopherol was not associated with any clinical event measured in this study.

**CONCLUSION:** Hyporetinolemia is common, particularly in subjects with severe mucositis, and is associated with an increased risk of herpes zoster infection in recipients of hematopoietic stem cell transplant. Additional investigations are required to determine whether these findings indicate a causal relation.

PMID: 12450904

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