

[Beta-carotene, vitamin A and carrier proteins in thyroid diseases].

[Article in German]

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Abstract

The conversion of beta-carotene (provitamin A) to 2 molecules of vitamin A (retinol) is accelerated by thyroxine and hyperthyroidism, respectively. The characteristic yellow tint of the skin in hypothyroidism is due to hyper-beta-carotenemia. Both in hyper- and hypothyroidism a retinol deficiency has been observed in literature. In a series of 36 patients (16 hyper-, 8 hypo-, and 12 euthyroid) serum samples were analyzed for retinol and beta-carotene levels (high pressure liquid chromatography) as well as retinol binding protein (radial immune diffusion), prealbumin (nephelometry), and serum zinc values (atomic absorption spectrometry) were established. The beta-carotene serum level in the hypothyroid group (mean 1.1 microgram/ml) was significantly higher ($p < 0.05$) in relation to euthyroid controls (0.6 microgram/ml), the hyperthyroid group showed significantly lower values (0.3 microgram/ml). RBP and prealbumin concentrations were significantly lower ($p < 0.05$) in hyperthyroid as against eu- and hypothyroid patients. Surprisingly, in all 3 groups the retinol levels were not significantly different, although the hyperthyroid group was slightly lower (0.6 microgram/ml) than the mean value of 0.7 micrograms/ml in the other groups. A vitamin A and protein rich food, customary in Central Europe, seems to rule out any vitamin A deficiency both in hyper- and hypothyroidism. However, the beta-carotene values are significantly higher in hypothyroidism, while in hyperthyroidism they were lower. As intrahepatic zinc content plays an important role in the synthesis of RBP and its secretion together with retinol, we also analyzed this component: The serum zinc levels in hyperthyroid patients were clearly higher (79.1 micrograms/dl) than in the hypothyroid group with 57 micrograms/dl ($p < 0.05$).

PMID: 8475673

[PubMed - indexed for MEDLINE]

