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Increased target tissue uptake of, and sensitivity to, testosterone in the vitamin B6 deficient rat

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Abstract

Six-week old male rats were maintained for 4 weeks on a vitamin B6-free diet to cause a moderately severe degree of vitamin B6 depletion. This led to a significant reduction in the circulating concentration of testosterone in plasma (control = 8.36 +/- 1.68, deficient = 2.13 +/- 0.54 nmol/l), but had no effect on circulating concentrations of luteinizing hormone, or, in intact males, on the weight of the prostate relative to body weight. In both intact and 24-h castrated animals vitamin B6 deficiency resulted in a significant increase in the uptake of [3H]testosterone into the prostate, and both increased and prolonged the specific nuclear retention of the steroid, as assessed by the ratio of radioactivity in the nuclear pellet: the high speed supernatant fraction. The results suggest that vitamin B6 has a function in the action of testosterone (and other steroid hormones), possibly in the recycling of receptors from the nucleus back into the cytosol after initial translocation. Vitamin B6 deficient animals have either a reduced rate of synthesis of testosterone or an increased rate of metabolic clearance compared with vitamin B6 supplemented controls, and this appears to be associated with enhanced target organ response to the hormone.

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