Vitamin D concentrations in children with growth hormon deficiency during first year of GH treatment

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Introduction:

The start of growth hormone (rhGH) treatment in children with growth hormone deficiency (GHD) causes a significant increase in bone turnover and increases height velocity. The increase in IGF-1 concentrations during rhGH treatment is a marker of the efficiency of treatment. Bone age delay at baseline is related to GHD and is a good predictor of height velocity during treatment. A significant increase in bone turnover during rhGH treatment results in an increased demand for vitamin D. It is important to determine proper supplementation doses of vitamin D in patients during catch-up growth.

Aim of study:

The aim of the study is to evaluate the correlation between IGF-1, bone age and 25-hydroxyvitamin D at baseline and in the first year of rhGH treatment, and height velocity before and during rhGH treatment.

Material and methods:

The study group consisted of 76 children aged 3–16 years with GHD. IGF-1 and 25-hydroxyvitamin D concentrations, bone age and anthropometric parameters were measured at baseline and during 12 months of treatment.

Results:

Vitamin D status at baseline correlated with height velocity before rhGH treatment ($p<0.05$, $r=0.49$). The mean 25-hydroxyvitamin D concentration at baseline was 19.57 ng/ml (±6,19 SD) and after 12 months of rhGH treatment with vitamin D supplementation it increased to 24.1 ng/ml (±6,88 SD). A negative correlation between Δ 25-hydroxyvitamin D and Δ IGF-1 ($p<0.05$, $r= -0.38$) was found.

Δ vitamin D vs. Δ IGF-1 ($p<0,05$, $r = -0,38$)

Conclusions:

Vitamin D status is related to height velocity and adequate vitamin D supplementation is important in patients with GHD during catch-up growth, when their bone turnover is increased as a result of rhGH treatment. Determining proper supplementation doses of vitamin D in such cases requires further research.