Evaluation of ALP value in early prediction of the effects of growth hormone treatment in children with growth hormone deficiency (GHD)

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The authors declare no conflict of interest

Background:
Serum bone turnover markers may serve as parameters for predicting the growth response to growth hormone (rhGH) treatment.

Objective and hypotheses:
Assessment of the alkaline phosphatase (ALP) value in early prediction of the effects of rhGH treatment in children with growth hormone deficiency (GHD).

Material and methods:
The study group consisted of 50 children with GHD. ALP, bone-ALP, vitamin D and IGF-1 concentrations were evaluated at baseline and after 6 and 12 months of rhGH treatment. The group was divided into two subgroups depending on puberty status (n = 15 prepubertal, n = 35 pubertal). The subgroups did not differ significantly in terms of GH deficiency defined as the maximum secretion of growth hormone in tests. IGF-1 concentration was normalized for bone age.

Results:
ALP after 6 months of rhGH treatment was significantly higher in the pubertal group (p<0.05). In the prepubertal children there was a tendency for increased ALP, but it was not statistically significant. In the following 6 months of rhGH treatment, ALP levels were not significantly altered. There was a statistically significant weak correlation between ALP at baseline and IGF-1 SD (r = 0.29) in the pubertal group. No such correlation was found in the prepubertal children. In the prepubertal children a correlation was found between ALP at baseline and a decrease in height deficiency SD (r = 0.26). In the pubertal group, there was no correlation between ALP and the growth response in the first year of treatment.

Conclusions:
The results suggest that bone turnover is increased after 6 months of rhGH treatment and reaches comparable levels after 12 months of therapy. In prepubertal children ALP may be a useful marker in predicting the growth response to rhGH treatment. In pubertal children ALP cannot be used as an isolated parameter in predicting the effects of rhGH treatment.