Relation between CNP signaling pathway and the effect of combined treatment with GnRHa and rhGH on the linear growth in mid/late pubertal girls at great bone ages with CPP or EFP

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OBJECTIVES

- To evaluate the effect of combined treatment with Gonadotropin-releasing hormone analogue (GnRHa) and recombinant human growth hormone (rhGH) on the linear growth in mid/late pubertal girls at great bone ages with central precocious puberty (CPP) or early and fast puberty (EFP).
- To investigate the relation between C-type natriuretic peptide (CNP) signaling pathway and GH’s effect on linear growth in these girls.

METHODS

Twenty-two girls were diagnosed as CPP or EFP, whose bone ages were older than 11.5 yrs, and received different therapies as follows: eleven girls received the combined treatment with rhGH and GnRHa, another eleven girls matched for auxological characteristics were treated with GnRHa alone. At the beginning and the end of the 6 months’ treatment, peripheral blood samples were collected to test serum amino-terminal proC-type natriuretic peptide (NTproCNP), insulin-like growth factor-1 (IGF-1) and procollagen type 1 amino-terminal propeptide (P1NP) concentrations. Comparisons were made among height velocity (HV), the improvement of predicted adult height (PAH) and the changes of serum NTproCNP, IGF-1, P1NP concentrations between the two groups.

RESULTS

After six months’ treatment, the height velocity and ΔPAH of the girls treated with rhGH and GnRHa were statistically faster and higher compared with control group (P<0.01). Serum NTproCNP [(10.5±4.9)pmol/l vs. (9.6±2.9)pmol/l], IGF-1 and P1NP concentrations were not significantly different between the beginning and the end of the 6 months’ treatment in the rhGH-combined group (P>0.05). In contrast, the girls treated with GnRHa alone showed a significantly decrease of both serum NTproCNP [(10.5±3.6)pmol/l vs. (6.9±1.5)pmol/l] and P1NP levels (P<0.05), but no significant change of serum IGF-1 level.

CONCLUSIONS

- In the CPP or EFP girls who are in mid/late puberty and at great bone ages, the combined treatment with rhGH and GnRHa may accelerate linear growth and improve predicted adult height.
- This growth-accelerating effect of rhGH could in part be induced by the increase production of CNP.

REFERENCES: