Prader Willi Syndrome and growth hormone therapy: valuable effects and adverse events.

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Introduction

Prader-Willi Syndrome (PWS) is a complex genetic psychosomatic disorder caused by deletion or maternal disomy within the long arm of chromosome 15. Incidence of PWS in Polish population is 1:10 000 – 1:25 000 of live births, which equals 20 – 25 born children each year. PWS is characterized by hypothalamic-pituitary dysfunction, which lead to short stature, abnormal body composition (increased fat mass and reduced lean tissue mass), hypogonadism and even morbidly obesity. The treatment of choice of PWS is the therapy with recombinant human growth hormone (rhGH) – since 2006 in Poland.

Aims

The objective of this study is to evaluate effects of rhGH treatment in children with Prader Willi Syndrome:

1. to investigate the evolution of:
   - obesity on basis of BMI-SDS,
   - growth velocity,
   - weight;
2. to estimate glucose metabolism;

Methods

Patients treated in Department of Paediatric and Adolescent Endocrinology in Polish American Institute of Paediatrics in Cracow in 2013. The study was conducted on a basis of data from patients records. Mean dose of rhGH – 0,62 IU/kg/week. Treatment duration was 5.9±2.62 yrs.

Discussion

Referring to the program’s objectives of growth hormone treatment in Prader-Willi syndrome, 5 children achieved normalisation of growth above the 10th percentile, and 6 increases in the appropriate channel or slightly higher MPH channel. In comparison, children not treated with GH reached height 155cm for males and 148cm for females.

Body weight increase should be appropriate to the increase of height.

Compared to population norms, BMI remained at a similar level during 4 years of treatment, but this is variable between individuals, because some children exhibit a very high levels of obesity.

BMI is insensitive surrogate measure for changes in body composition, particularly if lean tissue mass increased in parallel with decreased fat mass.

Increased IGF-I level can lead to hypothyroid tissue growth in children, which increases the risk of sleep apnoea. Therefore laryngological consultation should be performed before and during the therapy.

Careful attention should be given to glucose metabolism. GH decreases insulin sensitivity which may lead to type 2 diabetes mellitus, particularly in obese patients or patients with positive family history.

Scoliosis progression was observed in one pt, although according to the recent literature it is no longer considered to be an effect of rhGH therapy.

Results

Increase in growth during rhGH treatment

Changes in weight during rhGH treatment

Girls’ BMI at the time of study

Boys’ BMI at the time of study

Changes in BMI SDS during rhGH treatment

Comparison of growth rate, weight, BMI dynamism

Changes in dosage of rhGH

10/12 (83,3%) required rhGH dose reduction.
8/12 (16,7%) patients had their treatment interrupted, one boy because of excessive weight gain (36 kg over the time of 3 years) and one girl due to episodes of fainting.