The effect of GH treatment on physical performance indices in children with idiopathic short stature

Adi Weinberg, Nitzan Dror, Michal Pantanowitz, Dan Nemet, Alon Eliakim

MEIR MEDICAL CENTER
Tel Aviv University

CLALIT 100 YEARS

INTRODUCTION

Growth hormone (GH) is widely used as a performance-enhancing drug in sports, and is considered a prohibited doping agent by the World Anti-Doping Agency. The potential performance enhancing effects of GH include increased lean body mass, reduction in fat mass, and increased aerobic exercise capacity. However, these effects were found in GH deficient adults receiving GH replacement therapy, and whether GH administration exerts comparable effects in healthy GH sufficient individuals is controversial.

OBJECTIVES

To examine the effect of GH treatment on physical performance in children with idiopathic short stature and normal GH secretion. We hypothesized that children with ISS who are treated with growth hormone will have better fitness characteristics compared to children with short stature that were not treated with growth hormone

METHOD

Twenty-nine children participated in the study (13 GH-treated, 16 non-treated, age 8-13 years, Tanner stage 1-2). Participants performed the "Eurofit Physical Fitness Test" including plate tapping - a measure of hand-eye quickness and coordination, sit and reach - a measure of flexibility, standing broad jump - a measure of explosive leg power, 30 seconds sit ups - a measure of abdominal muscle strength and endurance, bent arm hang - a measure of arm strength and endurance, 20m shuttle run - a measure of aerobic capacity, and the Wingate Anaerobic Test (WAnT) to determine anaerobic capacity.

RESULTS

No statistically significant differences in any of the Eurofit physical fitness test results or the WAnT results were found between the groups.

Anthropometric characteristics of the study participants.

Measure	GH-Treated (n=13)	Non-Treated (n=16)
Age (years)	1.6±10.8	9.7±1.2
Height (cm)	131.5±9.2	130.2±7.9
Weight (Kg)	30.5±7.3	27.9±6.0
BMI percentile (%)	41.5±25.8	28.0±30.6
Tanner stage	1.4±0.5	1.2±0.4
Gender (F/M)	6/7	10/6
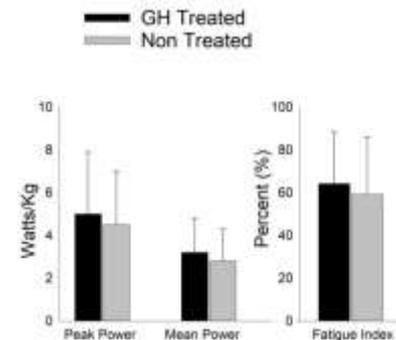
WAnt results comparison between GH treated and non treated children. No between group differences were found

CONCLUSIONS

Therapeutic dosage of GH for children with idiopathic short stature and normal GH secretion was not associated with beneficial effects on physical performance indices including measurements of flexibility, speed, explosive power, aerobic and anaerobic characteristics. During childhood and adolescence, when physiologic levels of anabolic hormones are relatively high, exogenous administration of GH has no additional benefit on physical performance.