Changes in body mass index in boys with central precocious puberty during and after gonadotropin-releasing hormone agonist treatment

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INTRODUCTION AND OBJECTIVES

Central precocious puberty (CPP) defines as activation of the hypothalamic-pituitary-gonadal axis before the age of 8 years in girls and 9 years in boys. As It is increased growth velocity and bone age acceleration, leading to adult height impairment. Gonadotropin-releasing hormone agonist (GnRHa) treatment is widely used for CPP. GnRHa is effective and selective suppression of gonadal sex steroid secretion to stop premature sexual maturation.

Leptin and its regulation may be important in the initiation and or progression of puberty and may play a role in the earlier onset of puberty in obese children compared to children of normal weight. Many studies show that obesity is associated with sexual maturation in adolescent girls and young female adults. Earlier pubertal development was positively associated with obesity and central obesity.

Although some authors found increases in body mass index (BMI) in girls after GnRHa treatment, most studies reported no significant difference in BMI in girls during and after treatment.

However, few studies have investigated changes in BMI in boys with CPP during and after GnRHa treatment. Hence, we aimed to evaluate the effects of GnRHa treatment on BMI in boys diagnosed with CPP.

METHODS

This study included 75 boys who had been diagnosed with CPP between January, 2007 and December, 2016, and treated with leuprorelin acetate or triptorelin acetate every 4 weeks for at least 2 years.

CPP was defined as the development of pubertal symptoms such as testicular volume ≥ 4cc before the age of 9 years, bone age advanced at least 1 year beyond chronological age, and a pubertal response to a GnRH stimulation test (peak luteinizing hormone response ≥5 IU/L).

The subjects were divided into three groups according to BMI: normal weight, overweight, and obese. We analyzed the BMI standard deviation score (SDS) in each group before treatment, after 1 and 2 years of treatment, at the end of treatment, and at 6 months of follow-up.

RESULTS

Of the 75 boys, 37 were in the normal weight group, 21 were in the overweight group and 17 were in the obese group. 25 of the boys were followed up for at least 6 months after treatment (11 in the normal weight group, 9 in the overweight group, 5 in the obese group).

All underwent brain MRI before treatment began, and 9 boys showed abnormal MRI findings. The mean BMI SDS for all boys at initiation of treatment was 1.0±0.8, and the BMI SDS in the normal weight, overweight, and obese group were 0.3±0.4, 1.3±0.1, and 1.9±0.3, respectively. Compared to the values before treatment, there were no significant differences in the BMI SDS in all patient groups after 1 or 2 years of treatment.

Moreover, for the boys who were followed up for at least 6 months, none of the patient groups showed any significant differences in the BMI SDS before treatment, at the end of treatment, or at 6 months after the end of treatment.

Figure 1. Changes in BMI SDS after 2 years of GnRH agonist treatment in subject with CPP

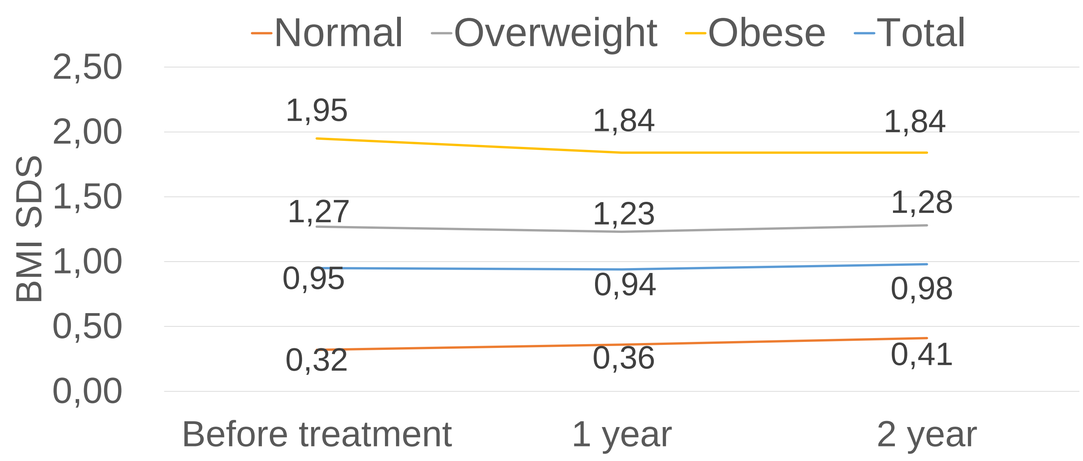
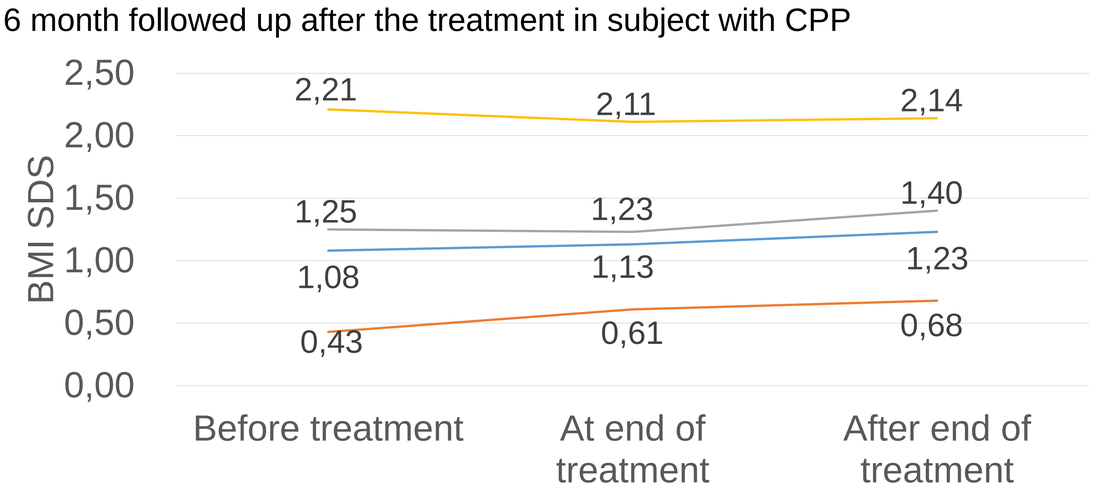


Figure 2. Changes in BMI SDS at the end of GnRH agonist treatment and at 6 month followed up after the treatment in subject with CPP



CONCLUSIONS

- Compared to the values before treatment, there were no significant differences in the BMI SDS in all patient groups after 1 or 2 years of treatment.

- For the boys who were followed up for at least 6 months, none of the patient groups showed any significant differences in the BMI SDS before treatment, at the end of treatment, or at 6 months after the end of treatment.

- The BMI SDS in boys with CPP did not significantly change during GnRH agonist treatment and after the end of treatment.

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Sex differentiation, gonads and gynaecology or sex endocrinology

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