INTRODUCTION

It is reported that children with congenital hypothyroidism (CH) are at increased risk of developing childhood obesity. Moreover, it is known that the timing of adiposity rebound (AR) in childhood is strongly linked with future obesity.

AIM

Aims of our study were to explore the timing of AR and to identify factors affecting AR in a cohort of children with CH diagnosed by newborn screening and treated with levothyroxine.

METHOD

Patients with permanent CH diagnosed from 1994 to 2012 treated with levothyroxine from the first month of life and followed at least until 8 years of age were included in this study.

Subgroups of normal body mass index (BMI) and obesity/overweight (BMI ≥ 85th percentile) by the latest BMI at 8 years of age and subgroups for different CH etiology (i.e. dysgenesis and dyshormonogenesis) were determined.

BMI at each age and the age of AR were compared with World Health Organization (WHO) references.

Correlation of age and BMI at AR in patients with BMI at 8 years, initial severity of hypothyroidism and initial levothyroxine dosage were examined.

RESULTS

Sixty-nine patients (44 females) with permanent CH were recruited in this study.

The age at AR was 3.44 ± 1.36 and 3.36 ± 1.21 years in boys and girls, respectively, and occurred significantly earlier than in WHO references (5.0 years in boys and 5.6 years in girls, p <0.001 for both sex).

Age at AR showed significant negative correlation with BMI at 8 years (r = −0.274, p < 0.05).

BMI at AR and at 8 years of age correlated positively (r = 0.460, p < 0.001).

There were no significant relationships between timing of AR and initial thyroid function or initial levothyroxine dosage.

The prevalence of obesity/overweight at 8 years of age was 29%. BMI at AR was 16.69 ± 1.34 kg/m² in obesity/overweight subgroup and 15.63 ± 1.28 kg/m² in normal BMI subgroup (p < 0.01).

BMI at 8 years of age was 22.38 ± 1.84 kg/m² in obesity/overweight subgroup and 17.04 ± 1.68 kg/m² (p <0.001).

At age 8, BMI at AR, and BMI at 8 years of age were not different of Messina, Messina, 4.3 (p < 0.01) for both sex).

Sixty patients were treated with levothyroxine. There were no significant differences in FT4 and TSH levels between the 47 patients with dysgenesis and the 22 with dyshormonogenesis.

CONCLUSIONS

Children with permanent CH showed significantly earlier AR compared to normal WHO references, which could predispose to obesity.

Prevalence of obesity/overweight at 8 years of age was 29% in our population with permanent CH.

Earlier AR was not related to the initial severity of hypothyroidism nor to the etiology of CH.

It is no yet clear which factors cause an early AR in patients with CH.