Introduction

- Congenital hypothyroidism (CH) can be permanent (P-CH) or transient (T-CH). These 2 CH types are difficult to differentiate prior to treatment initiation. However, previous studies have reported significant differences in the levothyroxine (LT4) dosages for 3-yr-old children with P-CH vs. T-CH (1-7), and seven studies have also identified LT4 dosage cutoffs for differentiating between P-CH and T-CH in 3-yr-old children (1-7).

- Several recent studies in which the oldest patients at the last observation were aged 6 years reported that LT4 dosage was a useful predictor of the duration of hypothyroidism. We also reported in their single-center study that when the LT4 dosage was <2.4 and <1.3 µg/kg/day at ages 1 and 3 years, respectively, T-CH should be suspected (7). However, the thyroid hormone requirement increases during puberty, with some patients with CH requiring an increase in their LT4 dosage during this period.

- In the present study, we retrospectively analyzed CH cases which were observed from the neonatal period past adolescence with the aim of identifying the LT4 dosage cutoff for predicting either P-CH or T-CH.

Patients and Methods

- The LT4 dosage and clinical data on 99 patients with CH who were followed at the participating hospitals from the neonatal period to 15 years of age or older were retrospectively analyzed. The participants were divided into the P-CH group (n = 75), who were treated with LT4, and the T-CH group (n = 24), who were not.

- Group P was further divided into 2 subgroups, a permanent-dysgenesis (PD) and permanent-eutopic (PE) group. In further subanalysis, 2 groups of patients were excluded: patients with a TSH level either below the lower detection limit of the TSH assay or above 10 µIU/mL excluded from Group T-

- Group P, excluding patients with LT4 <50 µg/day at the last visit

- Group P, excluding patients reported by Higuchi and Hasegawa added to group T

- Results

- At age 1 year, a higher LT4 dosage was required for the P-CH group (median 3.75 vs. 2.88 µg/kg/day; p < 0.001). When the LT4 dosage cutoff value at age 1 year was set at 4.79 and 1.74 µg/kg/day, the specificity of P-CH and T-CH (for denoting T-CH and P-CH, respectively) was 100 and 97%, respectively.

Conclusion

- LT4 dosage for CH treatment may be able to predict the permanent and temporary forms of the disease. An LT4 dosage exceeding 4.7 µg/kg/day and below 1.8 µg/kg/day at age 1 year may help predict P-CH and T-CH, respectively.

References