Management of Congenital Hypothyroidism during First Year of Life

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INTRODUCTION

Congenital hypothyroidism (CH) is a well-known cause of intellectual disability. Early initiation of treatment is a must. Studies have shown that over-treatment may also negatively impact intelligence. For quality improvement purposes we reviewed 71 patient charts to determine our CH management patterns during the first year of life in our population.

METHODS: Seventy-one patients diagnosed with CH from 2008 until 2016 and treated at TTUHSC were included in the base-line assessment. The TSH, free T4, total T4 and dose of thyroid hormone replacement was evaluated. We determined differences in the initial dose of thyroid replacement therapy among practitioners, and the length of therapy required to normalize TSH level, and frequency of over and under-treatment.

RESULTS:

Of the seventy-one patients with CH, there were 36 boys and 35 girls. Total of 28 were premature newborns. The average confirmatory TSH for preterm and term patients was 330mIU/L and 230mIU/L respectively. The average age of initiation of treatment was 17 days ranging from 6 days to 3 months (1 patient). Thirteen percent started by 1 week, 48% between 8-14 days. The term infants had an average dose of 10.3 mcg/kg/day (5.5 to 13), and preterm children averaged 10.1mcg/kg/day (7.2 to 17). The TSH normalized in an average of 42 days (3 wk to 6 mo). 23% normalized by 1 month and 92% normalized by 3 months. From the patients who had normalized TSH by 42 days, 84% of them went to their endocrinology appointment more than 3 times in one year. From patients who did not have normalized TSH by 42 days, 90% were seen more than 3 times in one year.
During the first year, 36% had periods of under treatment (UT) and 10% had overtreatment (OT), 20% were both UT and OT at some point. The premature newborns were more likely to be UT. The majority of UT and OT was during the first 3 months of age. The average number of clinic visits in the first 3 months of life was 4. The number of clinic visits varied for OT, UT, both UT and OT kids as well as euthyroid (4, 5.5 , 5.6 and 4.3 visits respectively).

DISCUSSION:

Our baseline assessment shows that CH patients who are born preterm versus term are started on a similar dose of thyroid replacement. The AAP recommends that CH patients are biochemically euthyroid by week 6 [2]. On average our patients became euthyroid by 42 days. A higher mental development index is associated with normalizing the TSH more rapidly [1], and we would like to normalize the TSH earlier. Frequency of follow up appointments does not appear to be associated with whether or not the patient is over treated or undertreated. From the EMR we could not assess patient's adherence which was likely one of factors affecting results.

CONCLUSION:

Using our study, we will implement measures that may assist in improving management of CH. We propose creating an electronic flow-sheet to remind the subspecialist and pediatrician of the standard of care of CH. We will provide patients and families a printed card consisting of recent labs, treatment plan, information about frequency of follow up, and importance of adherence to medication. We will continue to mail laboratory results after each visit. We will review our outcomes in 2-3 years.

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