Case study

CONNATE MYXEDEMA- AN INADEQUATE THYROID HORMONE PRODUCTION IN NEWBORN INFANTS

ABSTRACT:

Connate myxedema is also known as congenital hypothyroidism is an inborn endocrine disorder, affects 1 in every 3000 to 4000 infants. Numerous genetic defects are related with perpetual congenital hypothyroidism (CH). Ambient atmosphere, iatrogenic and immunologic factors are known to cause transient congenital hypothyroidism, which resolves within first few months of life. Molecular defects of thyroid oxidase system which is composed of at least two proteins may be involved in pathogenesis of lasting transient congenital hypothyroidism in infants with faults in iodide organification, for which the oxidase system is needed. Congenital hypothyroidism is predominantly sporadic but up to 2% of thyroid dysgenesis is inherited and congenital hypothyroidism due to organification faults is often recessively inherited. Levothyroxine is the drug of choice. An infant of 10 months old was presented with hoarseness while crying and noisy breathing. I had reported a case in which patient was diagnosed with congenital hypothyroidism and is being treated with levothyroxine.

KEYWORDS: Congenital hypothyroidism, dysgenesis, dyshormogenesis, Thyro Oxidase 2.

BACKGROUND:

Congenital hypothyroidism is an innate endocrine disorder, affects 1 in every 3000 to 4000 newborns. Numerous genetic defects are kindred with permanent congenital hypothyroidism. Environmental, induced and immunologic factors are known to prompt transient congenital hypothyroidism, which settles within first few months of life. Molecular defects of thyroid oxidase system which is made of at least two proteins may be incriminated in pathogenesis of persistent transient congenital hypothyroidism in newborns with defects in iodide organification, for which the oxidase system is essential. Biallelic deactivating mutations in the thyro oxidase 2 gene results in upset of thyroid hormone synthesis and related with severe and persistent congenital hypothyroidism. Monoallelic mutations are correlated with milder, transient hypothyroidism caused by inadequate thyroidal production of hydrogen peroxide. It averts the synthesis of adequate quantities of thyroid hormones to encounter the large demand for thyroid hormones at the inception of life.[1] In spite of the fact that the current experimental writing on the neurocognitive impacts of clinical hypothyroidism is very simple, clearly every individual analyzed as having this issue ought to be suggested for exhaustive neuropsychological assessment in perspective on the risk for intellectual dreariness.[2] Previous studies reported the cases of 3 infants with congenital hypothyroidism detected with the use of their newborn screening program, with evidence supporting that excess maternal iodine ingestion (12.5 mg/d) as the etiology.[3] According to a study, rising incidence of CH in Massachusetts is confined to mild and delayed cases. Findings suggest that this rise is attributable to enhanced detection rather than an absolute increase in numbers.4Screening in the first days of life seems to be the most important step in the approach to CH and replacement of related deficient hormones, thus preventing consequences that cannot be remedied. Hence, optimizing the sensitivity of

the screening test has great importance especially for the high risk group of neonates.[5] Earlier results suggest that more than one cause is responsible for the rise in the increasing CH incidence, with lowering of the screening TSH cutoff and an increased survival rate of a growing number of preterm babies both playing an important role.[6] According to earlier studies, beginning dose of 50 µg/day (12-17 µg/kg every day) for raised serum T4 and free T4 focuses to target run by 3 days and standardized TSH by about fourteen days of treatment. "Target run" of 10 to 18 µg/dl for T4 and 2 to 5.0 ng/dl for free T4 during the initial 2 weeks of L-thyroxine treatment. After 2 weeks of treatment the levels decreased to 10-16µg/dl for T4 and 1.6-2.2ng/dl for free T4.[7]

CASE PRESENTATION:

An infant of 10 months old was admitted to hospital with chief complaints of hoarseness while crying since 3months which is increasing day by day, noisy breathing since 2 months and no growth in weight of infant. Patient had a coarse facial feature as shown in **figure.1** underneath. The weight of child at the time of birth was 3.2 kgs. The patient mother is a known case of hypothyroidism since 2 years and was on medication (THYROXINE).Thyroid profile of patient is as follows: Triiodothyronine: 0.34 ng/ml (Normal range: 1.0-2.60 ng/ml),Total thyroxine: 0.6 mcg/100ml (Normal range: 6-14 mcg/100ml), Thyroid Stimulating Hormone: >100 µU/ml (Normal range: 0.7-6.4 µU/ml).Complete blood picture report is as following: Hemoglobin: 8.4 Gms%, RBC: 3.2 M/cmm, Haematocrit (P.C.V): 25 vol%, Reticulocyte count: 0.1%. Thyroid profile of patient revealed the increased levels of thyroid stimulating hormone and decreased levels of thyroxine and triiodothyronine. Impression of complete blood picture is Normocytic

Hypochromic Anemia. Patient was diagnosed with cretinism. Currently the patient is being treated with LEVOTHYROXINE 50 mcg/day.

CONSENT:

Written informed consent was obtained from the parents of infant for the publication of this case report and escorting images.

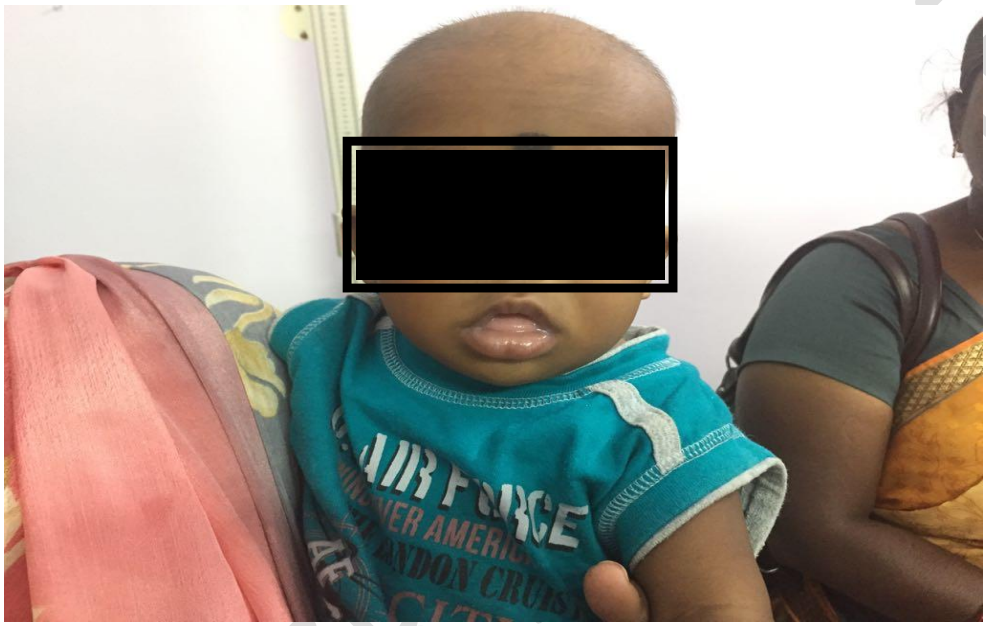

Figure.1: Coarse facial feature in patient.

DISCUSSION:

Congenital hypothyroidism is an ordinary neonatal metabolic disorder and consequences in neurodevelopment disability and infertility if untreated. Congenital hypothyroidism is occasional but up to 2% of thyroid dysgenesis is inherited and congenital hypothyroidism due to organification defaults is often recessively hereditary. The candidate genes interconnected with this genetic disorder form 2 main groups: one generating thyroid gland dysgenesis and other

generating dyshormogenesis. Genes correlated with thyroid gland dysgenesis encompass those engendering non-syndromic congenital hypothyroidism (TSH receptor) and those generating syndromic congenital hypothyroidism (TITF-1, TITF-2, PAX-8 and G5α). Genes associated with dyshormogenesis comprise sodium iodide symporter, thyroid peroxidase, pendrin, thyroglobulin and most latterly, thyro oxidase 2. Modern evidence proposes that third group of congenital hypothyroidism conditions are interconnected with defects in iodothyronine transporter, MCT8, where hypothyroidism is associated with neurologic shortfall.[8] Autosomal dominant transmission of mutations of NKX2-1 may lead to congenital hypothyroidism, neonatal respiratory distress at term and persistent neurologic manifestations such as dysarthria, choreoathetosis and ataxia in families with pretentious subjects in several generations.[9] The clinical manifestations are tenuous or not present at birth. This is due to trans-placental transit of few maternal thyroid hormones, while many newborns have some thyroid production of their own. Symptoms involve hoarse cry, neonatal hyperbilirubinemia, constipation for more than 3 weeks and lethargy. The most familiar signs are cold or mottled skin, umbilical hernia and macroglossia. Persistent jaundice and poor feeding are most noticeable clinical features. The diagnosis must be established by finding an increased serum thyroid stimulating hormone and thyroxine or free thyroxine level. Serum thyroid stimulating hormone and free thyroxine should be monitored for every 1-2 months in the first 6months of life and for every 3-4 months subsequently. Levothyroxine is the drug of choice; the endorsed starting dose is10-15 mcg/kg/day. The immediate goals of treatment are to quickly raise the serum thyroxine above 130nmol/l(10mcg/dl) and homogenize the serum thyroid stimulating hormone levels.[10] In some cases which were reported, the patients were acknowledged with clinical symptoms of lethargy, hoarse voice, failure to gain weight, feeding difficulties, dry skin, prominent tongue, difficulty in breathing and umbilical hernia.[11,12] In this

case the patient had a history of hoarseness while crying, noisy breathing and not gaining weight as seen in the earlier cases which were reported.

CONCLUSION:

Levothyroxine is the drug of choice; the recommended starting dose is 10-15 mcg/kg/day. Here in this case the patient is being treated with LEVOTHYROXINE 50 mcg/day which is appropriate to the patient's condition.

CONFLICTS OF INTEREST:

The authors declare that there's no conflict of interest concerning the publication of paper.

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