



## TRANSIENT CONGENITAL HYPOTHYROIDISM WITH MATERNAL CARBAMAZEPINE

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### ABSTRACT

Transient Congenital Hypothyroidism is a temporary abnormality of thyroid function in the newborn which is rare and usually caused by prematurity, low birth weight and maternal antibodies and drugs. Here we are reporting a case of transient congenital hypothyroidism with maternal carbamazepine therapy.

**KEYWORDS:** Thyroid stimulating hormone, Newborn screening, absent epiphyses.

### INTRODUCTION

Carbamazepine (CBZ) is one of the common anti epileptic drug (AED) used during pregnancy. It is associated with low risk of birth defects and better neurodevelopmental outcome.<sup>[1]</sup> Subclinical reversible hypothyroidism is reported in 30% of patients on AEDs including CBZ.<sup>[2]</sup> In a study of 36 children on CBZ therapy, decreased serum free thyroxine (T4) and increased thyroid stimulating hormone (TSH) were noted in the follow up in 13.9%.<sup>[3]</sup> We report on a neonate with transient congenital hypothyroidism (CH) due to maternal CBZ therapy for its rarity.

### CASE REPORT

A 33 year old primi mother delivered a term male baby with birth weight of 3500g. She was an epileptic on CBZ at 1.2 g/day since ten years. Antenatal sonograms were normal. Baby had no complications at birth and examination was normal. Newborn screening by cord blood TSH was 31.4 mIU/ml (normal 2.5-20). Serum TSH done on day five of life as per protocol was 44.5 mIU/ml and free T4 1.2 ng/dl (normal >0.76 ng/dl). Radiograph of knee showed absent epiphyses and radioisotope technetium scan did not show dysgenesis or ectopic thyroid. Maternal thyroid function test (TFT) and CBZ levels were normal. A diagnosis of CH was made and baby was started on thyroxine (10 microgram/kg/day). Follow up at six weeks showed normal linear growth, head circumference and development. Serum TSH was 1.7 mIU/ml and free T4 1.72 ng/dl, hence same dose of thyroxine was continued. As at three and six months of age, serum TSH was <1.5 mIU/ml with no incremental dose of thyroxine, possibility of transient CH was considered and thyroxine was stopped. TFT repeated after four weeks was normal.

### DISCUSSION

Transient CH is defined as temporary abnormality of thyroid function in the newborn, either clinical or biochemical, which may or may not require replacement therapy. Transient CH is rare and is usually caused by prematurity, low birth weight, maternal antibodies and drugs specifically amiodarone. Though CBZ is known to cause hypothyroidism in children and adults there are no reports of it causing transient CH in the neonates.<sup>[4]</sup> The drug induces cytochrome P450 complex (CYP3A) leading to increased T4 metabolism in the liver and clearance rate. There may be 20-40 percent decrease in serum total and free T4 in euthyroid patients.<sup>[5]</sup> Vaninonapaa et al., found that 12(63%) of 19 children on CBZ with mean dose of 489 mg/day for a mean period of 4.1 years had reversible subclinical hypothyroidism.<sup>[6]</sup> Turan et al in 58 children on CBZ for more than a year found no significant difference in TFT as compared to normal controls.<sup>[7]</sup> Early recognition and treatment of CH, even if transient is important to prevent long term effects of neurocognitive outcome which may otherwise be attributed to a perinatal event. This case report highlights the importance of universal newborn screening for CH especially if there is history of maternal AED.

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