

CASE REPORT

A Case Report on Hypocalcemic Seizures Secondary to Maternal and Infant Vitamin D Deficiency

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Abstract:

Maternal vitamin D insufficiency is not uncommon. Usual causes of maternal deficiency in vitamin D and or calcium are due to cultural modifications in their diets or clothing habits. Infant born to mothers who are on breastfeeding are also at risk of developing vitamin D deficiency, hypocalcemia and seizure. We present a case of an infant with hypocalcemic seizures secondary to vitamin D deficiency.

Hypocalcemic seizure may occur in term or preterm neonates due to maternal vitamin D insufficiency. It is not common to present with hypocalcemic seizures at 4 to 5 months age in an otherwise healthy child with uneventful neonatal period.

Keywords: Convulsion, Hypocalcemia, Infant

Background

We would like to present a case of an infant with seizures secondary to hypocalcemia where other abnormal findings were low vitamin D levels both in the infant and in the mother.

Case Presentation

A 5 months old boy was admitted into a pediatric intensive care unit (PICU) of a private tertiary care hospital of Chittagong Bangladesh with repeated generalized convulsions. He was transferred to PICU from a hospital where he was admitted for 10 hours and was treated for status epilepticus. He had no fever, history of trauma, immediate prior vaccination or any abnormal neurological feature. He was born of normal vaginal delivery at term and had a birth weight of 2.9 kg. He was exclusively breast fed since birth. His postnatal period was uneventful. . Mother dressed in her cultural customs, where most of her body was covered. Mother was taking average nutritional diet and irregular vitamin supplements during pregnancy. His immediate past history is significant that, he had a history of admission into another private hospital with generalized convulsions at the age of 4 1/2 months. At that time he was diagnosed as a case of Encephalitis and treated accordingly. But in our view the diagnosis could be in question because on query from the mother said, as she was asked directly, that during that time of the illness her baby was not febrile and was perfectly alright in between convulsions. To support our view, all the routine investigations including CSF study done at that time revealed normal. Bacterial infections were also excluded clinically and by lab investigations. Though hypocalcemia was found, it was not addressed appropriately.

After admission in PICU blood glucose level was found normal. Reports of all base line investigations were normal. CSF examination was not done as it was not indicated.

Laboratory investigations in blood, revealed calcium 1.4 mmol/L(normal level between 2.25 and 2.62 mmol/L), magnesium 0.8 mmol/L(normal level 0.70—1.06 mmol/L), vitamin D 15.20 ng/ml. Vitamin D deficiency is defined as <20ng/ml, and insufficiency levels between 20 and 30 ng/ml. Indicating vitamin D deficiency and hypocalcemia. His parathyroid hormone level (PTH) was 74 pg/ml. The normal levels in our laboratory are between 7 to 53pg/ml for PTH. Alakaline Phosphatase level was normal.

Maternal vitamin D was 12.62 ng/ml; and her serum calcium was 2.1 mmol/L (normal level between 2.23 and 2.53 mmol/L), magnesium 1.0 mmol/L(normal level 0.70—1.0 mmol/L), vitamin D was 12.62 ng/ml (normal level 20-50 ng/ml). She got supplementation of vitamin D for next 6 months.

As we attended the patient, he was not in convulsion. It was suspected as a case of hypocalcemic seizure and all supplementations were started orally. As there was no convulsion within next 24 hour, all were continued as before. Acical dx effervescent tablet (containing 600mg calcium carbonate and 400iu vitamin D) 1 tablet was given orally in divided doses and was continued up to 1 year of age. Multivitamin drop 10 drops daily containing 400 iu vitamin D was added and was continued for 1 month. As injectable phenytoin was started in previous hospital, it was given orally, then tapered and discontinued over 3 weeks. No antibiotic was given. There was no convulsion till then. Sun exposure and calcium containing diets were encouraged after 6 month of age.

After 1 month his calcium level was 2.4 mmol/L, vitamin D level was 29 ng/ml. After the next 3 months the level was 2.3 mmol/L and 29 ng/ml respectively. Again after 3 months, i.e.at 1 year of age his serum calcium level

was 2.2 mmol/L and vitamin D level 13 ng/ml. Then Hepta Seas Syrup (containing vitamin D 200IU/5 ml) 2.5ml daily was added . Sun exposure was encouraged.

Now the child is doing well and his development is according to his chronological age.

Discussion

Maternal vitamin D deficiency is one of the major risk factors for neonatal vitamin D deficiency followed by neonatal hypocalcemia [1]. Hypocalcemia is a recognized cause of seizure in neonate and infants [2].

Transplacental transport of vitamin D, mostly 25-D, typically provides enough vitamin D for the first 2 month of life unless there is severe maternal vitamin D deficiency [3].

It is not uncommon to find vitamin D insufficiency in otherwise, healthy pregnant Women [4]. Infants born to such mothers have reduced umbilical cord blood concentrations of 25-hydroxycholecalciferol [5]. In addition, breast milk contains only 12-60 IU of vitamin D per litre. This varies according to maternal vitamin D status [6].

In 1991, the Committee on Medical Aspects of Food Policy recommended that all pregnant and lactating mothers should receive 400 IU vitamin D daily in UK [7]. This policy has not been implemented widely there and not in Bangladesh as well.

Intestinal calcium absorption doubles in the first trimester, well before the rise in free calcitriol levels during the third trimester. Neonatal hypocalcemia can occur in infants born of mothers with severe vitamin D deficiency, but it is in the weeks to months after birth as intestinal calcium absorption becomes more dependent on calcitriol.

Vitamin D deficiency most commonly occurs in infancy because of a combination of poor intake and inadequate sun exposure and usually present with rickets.

Hypocalcemic seizures in rachitic infants are invariably associated with severe vitamin D deficiency in mothers [8].

During management of hypocalcemic seizure effervescent calcium tablet was used and it worked. It's onset of action, duration of action and half-life is not known yet.

Hypocalcaemic seizures in an infant other than neonate without any rachitic feature as a consequence of maternal vitamin D deficiency is not well described which is an easily preventable and correctable condition.

If an otherwise healthy breastfed child found to have seizure due to hypocalcemia and or due to hypovitaminosis, it is prudent to assess the calcium and vitamin D status of the mother.

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