

Hypocalcemic Tetany Unmasked by Dengue Fever in Primary Hypoparathyroidism

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ABSTRACT

A rare endocrine disorder hypoparathyroidism is characterized by low blood serum calcium levels and parathyroid hormone levels. We report a 28 years old male who presented with fever of 3 days duration with the inward turning of both hands on the third day of febrile illness with low calcium level and thrombocytopenia. Subsequently, he was diagnosed to be a case of dengue fever (DF). Non-contrast head CT of the brain revealed calcifications in bilateral thalamus, bilateral basal ganglion, subcortical white matter, and bilateral dendritic cerebellar nuclei. A case of hypoparathyroidism which was previously undiagnosed presented with hypocalcemia tetany with acute dengue illness for the first time. Though hypocalcemia can occur in dengue fever symptomatic hypocalcemia is not common.

Key Words: Dengue Fever, Hypocalcemia, Tetany, Primary hypoparathyroidism

INTRODUCTION

Case Report

A 28-year male patient who presented to our emergency with a fever duration of 3 days. On the third day of his fever in the morning, he had inward turned of his both hands (Fig 1) for which he came to our hospital. Not associated with any numbness or tingling sensation over the perioral or fingertip, toes. There was no history of seizures, muscle cramps, gastrointestinal disorders, phonophobia. Although he gives a history of fever several times in the past but never had carpopedal spasms along with it. No history of any thyroid or neck surgeries, bowel surgeries, any long term medications intake or any history of irradiation, co-morbid illness, or any significant familial history. On clinical examination, bilateral carpal spasms were present, Chvostek sign and trousseau signs both were positive. All the vital signs were stable. There were no skeletal deformities like scoliosis or short metacarpals. Systemic examination of respiratory Cardiovascular, the abdominal examination was normal. On CNS examination, the tone was increased in the upper limb, and the rest CNS examination was normal.

On ophthalmological examination, the fundus was normal.

Figure 1: Patient presented with carpal spasm

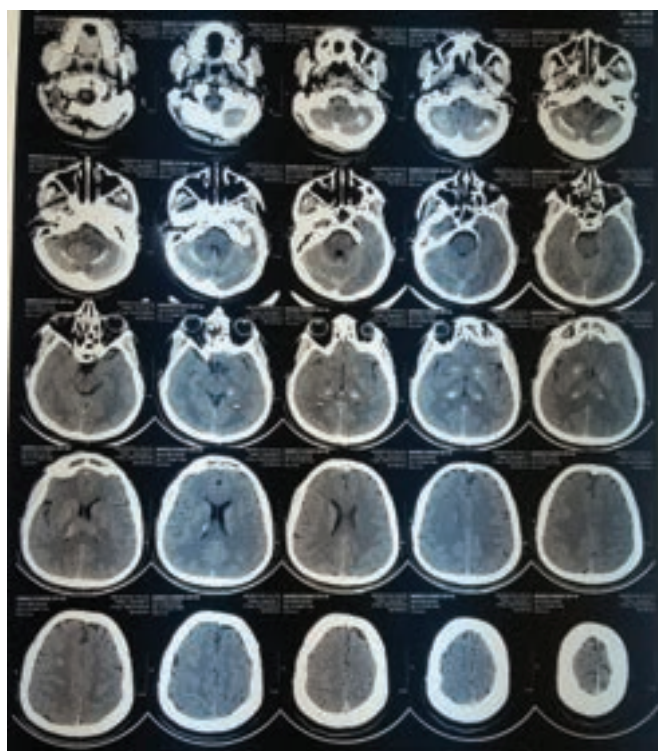


An urgent complete blood count, including serum calcium, were sent on presentation in view of the patient had carpal spasms. The platelet count of the patient was 80000/cmm (1.5-4.5L/cm). As the patient had febrile thrombocytopenia, a provisional diagnosis of Dengue infection was made. The serum calcium level was 6.2 mg/dl, which was below the reference range (8.5-10.2mg/dl). Intravenous 10% calcium

gluconate was given in view of his carpal spasms, which relieved his symptoms. Electrocardiography (ECG) showed a prolonged QT interval, and QTc (corrected QT interval) was 512 ms. He was given injection calcium gluconate 8 hourly slowly intravenously (over 10 minutes). Simultaneously he was put on Vitamin D3 and calcium carbonate supplementation orally with close monitoring of calcium levels.

The patient was further evaluated for the hypocalcemia and simultaneously was monitored and managed for fever. Renal function test showed mild increase in creatinine value (1.67 mg/dl, normal range 0.7-1.2 mg/dl) and raised liver enzymes i.e. aspartate aminotransferase values (AST) (80 U/L, range 5-35 U/L). It was later returned to normal baseline values. Hypoparathyroidism and pseudohypoparathyroidism were considered, and the patient was evaluated for hypocalcemia. The serum parathyroid hormone (PTH) level was sent, and the value was significantly low (7.51 pg/ml, normal range 14.0 – 72.0 pg/ml). Non-contrast computed tomography (CT) scan of the brain showed calcifications in bilateral thalamus, bilateral basal ganglion, subcortical white matter, bilateral dendritic cerebellar nuclei (Fig. 2).

Figure 2: NCCT Brain revealed calcifications in bilateral thalamus, bilateral basal ganglion, subcortical white matter, bilateral dendritic cerebellar nuclei.



He made an uneventful recovery, and at day 7 of his febrile illness, his platelet count improved and returned to normal range along with serum calcium level increased to 8.1mg/dl by day 9 of admission. On day 5 of his illness, Dengue IgM/IgG serology was found to be a positive and initial diagnosis of dengue fever was confirmed. The patient was discharged on oral calcium, and vitamin D supplementation with regular follow up in the outpatient department.

DISCUSSION

One of the most common mosquito-borne viral infections in the world is Dengue (1). Every year there are nearly 50 million dengue infections, and out of this 500,000 persons are having Dengue hemorrhagic fever (DHF) seen mainly in America, the Pacific, Southeast Asia (2). In primary hypoparathyroidism, despite the significantly low serum calcium levels, its clinical manifestation may not be seen until late adulthood (3). Similarly, this patient did not experience any symptoms of hypocalcemia until he had a concurrent acute febrile illness in the form of dengue fever. There is some evidence that in dengue fever, the hypocalcemia maybe more pronounced (4), although lower calcium levels have not shown to be associated with mortality (5). Hypocalcemia occurring in dengue fever is rarely known to be symptomatic, and the mechanism is also unclear (6). There are some in vitro studies which show that depletion of calcium enhances the binding of dengue virus to B cells and T cells lineages (7) and calcium is necessary for the production of dengue-specific T-cytotoxic cells.

Further dengue virus causes an influx of calcium into the T-helper cells. Hypocalcemia may increase the toxicity of the dengue virus. And similarly, disorders of the intracellular calcium storage may result in myocarditis. Calcium also plays an important role in the aggregation of the platelets. In our patient, hypocalcemia was detected early because of tetany in the form of carpal spasm. Timely correction of hypocalcemia might have resulted in a mild form of dengue fever,

Apart from the clinical features, NCCT head of the patient showed calcifications in bilateral thalamus, basal ganglion, subcortical white matter, and dendritic cerebellar nuclei. Intracranial calcification is known to occur in hypoparathyroidism. There are other causes of intracranial calcification. Fahr syndrome is one such condition where calcification occur in basal ganglia and other parts of the brain

(8). This condition is idiopathic, and there is no discernible underlying cause. The present patient had primary hypoparathyroidism. The diagnosis was confirmed by low serum calcium and low PTH levels. The complications related to hypocalcemia may occur at any point of life in untreated cases of primary hypoparathyroidism, and calcium replacement is considered lifesaving in such cases. In primary hypoparathyroidism the goal of treatment is to maintain serum calcium to decrease symptoms related to hypocalcemia, but normocalcemia is also to be avoided at the same time, which may result in hypercalciuria (9). It is preferable to keep serum calcium in the low normal range. This can be done with the judicious use of calcium carbonate and vitamin D3 supplementation along with monitoring of calcium excretion in the urine (10). Constantine et al. (11) demonstrated that the serum-free calcium levels may be significantly correlated with the severity of dengue and concluded that the mean serum free calcium was significantly lower in dengue hemorrhagic fever (DHF) as compared to dengue fever (DF). The prevalence of hypocalcemia is also reported to be higher in patients with DHF than with DF.

CONCLUSION

We conclude that dengue infection can unmask an otherwise asymptomatic primary hypoparathyroidism and may present as hypocalcemic tetany. Further study is required to see whether hypocalcemia is associated with the severity of dengue manifestation and whether the correction of hypocalcemia improves the prognosis.

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