Case Report

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Neonatal Seizures and Hypomagnesemia: A Case Report.

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Abstract

This case report describes a 6-day-old neonate presenting with recurrent focal seizures attributed to hypomagnesemia. Hypomagnesemia in neonates is a critical yet often overlooked electrolyte imbalance that can lead to significant neurological manifestations, including seizures. The infant was admitted to the neonatal intensive care unit with convulsions, where initial laboratory tests revealed markedly reduced serum magnesium. Intravenous magnesium sulfate was administered, resulting in the cessation of seizures. Follow-up over a six-month period showed no recurrence of seizures, and subsequent magnesium levels remained within the normal range with oral supplementation. This case underscores the importance of considering electrolyte imbalances in the differential diagnosis of neonatal seizures. Early recognition and management of hypomagnesemia are crucial for preventing potential neurological sequelae.

Keywords:- Neonatal Seizures, Hypomagnesemia, Magnesium Sulphate, Outcome.

INTRODUCTION

Hypomagnesemia, defined as a serum magnesium level less than 1.4 mg/dL, is a potentially life-threatening electrolyte disturbance that can manifest prominently in the neonatal period.[1] Magnesium plays a pivotal role in numerous biochemical processes including nerve transmission and muscle contraction, making its deficiency particularly impactful in neonates. [2]

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Epidemiologically, hypomagnesemia in neonates can occur due to maternal hypomagnesemia, inadequate neonatal stores, or gastrointestinal and renal losses. [3] It is frequently underdiagnosed due to the nonspecific nature of its clinical presentation. The pathophysiology of hypomagnesemia involves inadequate magnesium intake, increased renal excretion, or gastrointestinal losses. In neonates, this can lead to increased neuromuscular excitability and potentially seizures. [4]

Clinically, neonates with hypomagnesemia may present with nonspecific symptoms such as jitteriness, tremors, and generalized tonic-clonic movements, which may be misinterpreted as neonatal seizures. The diagnosis of hypomagnesemia requires a high index of suspicion and confirmation via serum magnesium levels. Additional tests to consider include serum calcium and potassium, as these electrolytes may also be imbalanced in the presence of magnesium deficiency. [5]

In the case presented, the neonate's significant finding was recurrent focal seizures, which is a less common manifestation of hypomagnesemia, emphasizing the need for thorough investigation in similar clinical scenarios.

CASE REPORT

The patient was a 6-day-old male neonate born at term via normal vaginal delivery with an uneventful prenatal history. The mother's pregnancy was uncomplicated, and she had no significant medical history. On day 6 post-birth, the infant exhibited recurrent episodes of focal clonic seizures involving the right arm and face.

Upon admission to the neonatal intensive care unit, the patient was afebrile, with normal vital signs but appeared lethargic during examination. Initial blood tests showed a serum magnesium level of 0.8 mg/dL (normal: 1.7-2.2 mg/dL), confirming hypomagnesemia. Serum calcium and potassium levels were within normal limits.

Management included immediate administration of 0.2 mL/kg of 50% magnesium sulfate intravenously, followed by maintenance doses to correct the deficiency. Over the next 48 hours, the neonate's serum magnesium levels normalized, and no further seizure activity was observed.

The patient remained seizure-free with normal developmental milestones at a six-month follow-up. Long-term management included oral magnesium supplementation, with regular monitoring of magnesium levels to prevent recurrence.

Parameter	Result at Presentation	Normal Range
Serum Magnesium	0.8 mg/dL	1.7-2.2 mg/dL
Serum Calcium	9.6 mg/dL	8.6-10.3 mg/dL
Serum Potassium	4.9 mEq/L	3.5-5.5 mEq/L
Serum Sodium	140 mEq/L	135-145 mEq/L
Blood Glucose	90 mg/dL	70-100 mg/dL

Table 1: Laboratory Investigations of the Neonate with seizures.

DISCUSSION

This case illustrates the critical importance of considering electrolyte imbalances in the differential diagnosis of neonatal seizures. Hypomagnesemia, though less common than other electrolyte disturbances such as hyponatremia or hypocalcaemia, can lead to severe neurological consequences if not promptly identified and managed.[7]

Similar cases have been reported, such as one by Cappellari AM et al where authors described case of a newborn with recurrent focal seizures due to transient hypomagnesemia.[8] Another case report by Visudhiphan P described two female siblings suffering from hypomagnesemia with secondary hypocalcemia, diagnosed at the third and fifth week of age.[9]

This case is particularly instructive for neonatologists and pediatricians, highlighting the need for routine magnesium level screening in neonates presenting with seizures. It also emphasizes the efficacy of magnesium sulfate in treating and preventing recurrent seizures associated with hypomagnesemia[10]

CONCLUSION

This case report underscores the significance of hypomagnesemia as an etiological factor for neonatal seizures. Early recognition, prompt laboratory investigation, and management with magnesium supplementation are crucial to preventing neurological complications. This case adds to the

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