Case Reports

Transient Pseudohypoparathyroidism and Neonatal Seizure

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Summary

The case of a neonate is presented who had late onset seizure associated with hypocalcemia, hyperphosphatemia, and raised parathyroid hormone. The infant did not have any stigmata of pseudohypoparathyroidism. The hypocalcemia was initially resistant to calcium therapy, but responded to vitamin D analog therapy. The diagnosis of 'transient neonatal pseudohypoparathyroidism' was entertained, as the infant remained stable and seizure-free with normal serum biochemistry during 8 months of follow-up.

Introduction

In late-onset neonatal seizure, metabolic causes come high up in the list of differential diagnosis. Among the metabolic causes, hypocalcemia is the most important. In neonates, hypocalcemia is caused by many factors, namely high phosphate load in the milk, congenital hypoparathyroidism, or maternal hyperparathyroidism.[1] Here we describe a case of late-onset neonatal seizure secondary to hypocalcemia with hyperphosphatemia and raised parathyroid hormone (PTH). An extensive work-up led to the possible diagnosis of transient neonatal pseudohypoparathyroidism. The term was coined recently by Minagawa, *et al.*,[2] when describing three neonates with this problem. The mechanism for the transient nature of the disorder was attributed to the transient defect in the signal distal to cAMP or the signal transduction system, which improves with time.

Case Report

A 21-day-old female infant was brought to the Accident and Emergency Department with a 1-day history of recurrent seizures. After initial assessment and stabilization and control of seizures with i.v. diazepam and an i.v. bolus dose of phenytoin, she was transferred to the neonatal intensive care unit for further management. The history revealed a normal, uncomplicated antenatal, natal, and postnatal course. A detailed physical examination of the infant was unremarkable with normal vital signs (pulse 140/min, respiratory rate 40/min, temperature 38ºC, blood pressure of 83/50 mmHg). The report of serum biochemistry (Table 1) revealed an alarmingly low serum calcium of 1.52 mmol/l (normal = 2.20–2.70 mmol/l). The head ultrasound and electrocardiogram were normal. In view of her symptoms and low serum calcium, she was started on i.v. calcium supplement.

Despite adequate supplementation, the serum calcium remained low. The infant was started on a synthetic analog of vitamin D, alfacalcidol (1-α-hydroxyvitamin D_3: 1 drop = 0.1 μg), in a dose of 4 drops OD = 0.4 μg = 0.1 μg/kg/day. The response was dramatic. The seizures resolved and the serum calcium became normal. On day 3 of admission, the infant was seizure-free and cerebrospinal fluid and blood cultures were negative. She remained stable and was discharged home. Gradually the infant was weaned off the supplementation. When last seen in the clinic, she was 8 months old with good weight gain (7700 g; 50 per cent). She had no episodes of seizure or hypocalcemia during the 8-month follow-up period.

Discussion

In this case, the common causes for late-onset neonatal hypocalcemia (oral phosphate load, hypomagnesemia, primary or secondary congenital hypoparathyroidism) were ruled out.[2] There was no history of maternal diabetes, birth asphyxia or prematurity. The infant had not been given any medication or artificial formula feeds. The maternal parathyroid hormone (PTH) was normal, ruling out maternal hyperparathyroidism. A high PTH level in the infant ruled out the diagnosis of primary congenital hypoparathyroidism.

The triad of hypocalcemia, hyperphosphatemia, and raised PTH suggested the diagnosis of pseudohypoparathyroidism,[3] but no stigmata of the pseudohypoparathyroidism were noted on examination.[4] The infant was followed-up for 8 months with no reoccurrence of seizure or hypocalcemia. The

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TABLE 1
Serum biochemistry results

Test	Patient's value	Normal range
Calcium	1.52[a]	2.20–2.70 mmol/l
Phosphate	2.52[a]	1.45–2.17 mmol/l
Magnesium	0.79	0.61–0.89 mmol/l
Sodium	137	135–142 mmol/l
Potassium	4.7	3.5–5.2 mmol/l
Chloride	105	96–110 mmol/l
Carbon dioxide	25	24–32 mmol/l
Urea	0.7	1.5–5 mmol/l
Creatinine	21	15–50 µmol/l
Alkaline phosphatase	441	80–500 IU/l
Parathyroid hormone[b] (infant)	9.1[a]	1.3–5.4 pmol/l
Parathyroid hormone (mother)	2.6	
Albumin	32	30–45 G/l
Glucose	4.6	4–8 mmol/l
Bilirubin	17	35–100 µmol/l
Ammonia	65	12–50 µmol/l

[a] Abnormal values.
[b] Parathyroid hormone (C-terminal assay).

normal course suggested the transient nature of the condition. Thus, by exclusion, the diagnosis of transient neonatal pseudohypoparathyroidism was finally entertained.

In conclusion, in a case of late-onset neonatal seizure secondary to hypocalcemia with hyperphosphatemia and raised PTH, the diagnosis of transient pseudohypoparathyroidism should be considered.

References

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