

Carpal Spasm in a Patient with Hypophosphatemia

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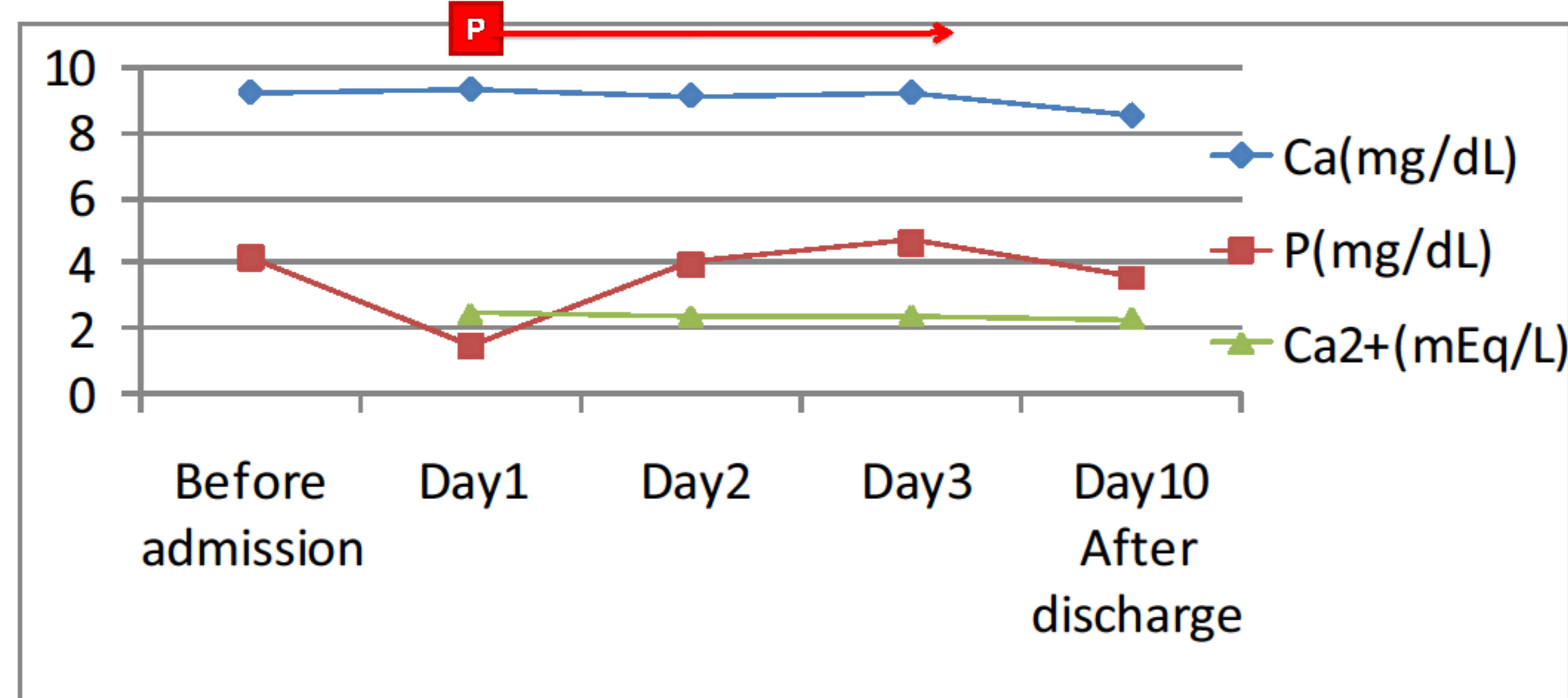
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Introduction

- Phosphate is an essential ion and plays a vital role in many physiological processes
- Neurologic symptoms reported in hypophosphatemia are neuropathy, paresthesias, dysarthria, altered mental status, seizures, delirium and convulsion and they are rare but seen in severe hypophosphatemia
- Carpedal spasm is known as a symptom of hypocalcemia or rarely hypomagnesemia
- We present an unusual case of carpal spasm seen in a patient with hypophosphatemia

Case report

- A fourteen-year-old boy was admitted with acute onset of both carpal spasm
- He had a shrimp salad for dinner 1 day before
- After 2 times of vomiting and diarrhea, both carpal spasm and paresthesia were developed 3 hours later
- When he visited our clinic for gynecomastia 1 week before, thyroid hormones, growth hormone, sex hormones including estrogen, progesterone and testosterone were in normal range at his age
- He was awake, alert and his vital sign was stable
- On physical examination, he had intact strength in all four extremities but paresthesia, tingling sensation was on his both hands and around his lips
- Neurologic examination were unremarkable
- Nerve conduction study of median nerve and ulnar nerve on both hands showed normal patterns
- Serum electrolytes and blood gas analysis were within normal limits
- Biochemical investigation revealed only hypophosphatemia without hypocalcemia and hypomagnesemia
- Other hormone tests related to calcium/phosphate metabolism were within normal limits
- He treated with intravenous phosphate (over 36 hours at a rate of 2 mmol/hours)
- Carpal spasm improved with correction of hypophosphatemia



Parameters	Before admission	Hospitalization			After Discharge Day10
		Day1	Day2	Day3	
Calcium (mg/dL)	9.3	9.4	9.2	9.3	8.6
Phosphate (mg/dL)	4.2	1.5	4.0	4.7	3.6
Ionized calcium (mEq/L)	-	2.4	2.4	2.4	2.3

	Result	Normal
Parathyroid hormone	14.5 mg/mL	13-54 mg/mL
Calcitonin	1.7 pg/mL	0.5-9.6 pg/mL
Vitamin D3-1,25(OH) ₂	38.75 pg/mL	19.6-54.3 pg/mL
Vitamin D3-25(OH)	11.35 ng/mL	4.1-28.7 ng/mL
Calcium (urine)	1.6 mg/dL	0.22-9.47 mg/dL
Phosphate (urine)	41.8 mg/dL	5-189 mg/dL

Conclusion

- The pathophysiology of neurologic dysfunction related to hypophosphatemia is not clear yet
- The physiological effects of hypophosphatemia is suggested to play a role in pathophysiology of neurologic dysfunction. In hypophosphatemia, increased oxyhaemoglobin affinity and hemolytic anemia can develop, then they can lead to tissue hypoxia and altered tissue function
- Careful observation of serum electrolytes including phosphate is necessary when the patient has neurologic symptoms

References

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