

Case Report: Fleet Enema in the Renal Patient

Emile Hay MD*, Pablo Boksenbojm MD* and Peer Esther RN MA*

* *The Risk Management Unit, Barzilai Medical Center, Ashkelon, Israel*

Abstract:

We describe a case of administration of fleet enema in a patient for whom such treatment is hazardous. Contraindications to fleet enema use, complications, and management are reviewed.

MeSH Words: Fleet enema, renal failure, sodium phosphate, medication error, emergency department

Case:

Fleet enema is widely used in Israel for constipation. Each bottle contains sodium biphosphate 16 G and sodium phosphate 6 G per 100cc (1). The prescribing leaflet and the Israeli index of drugs, Medic, do not contain any clear warning or contra-indication about its use in renal failure. The product is approved for use by the Ministry of Health in Israel.

In this case, a 67 year old hemodialysis patient was hospitalized for abdominal pain and constipation. Plain abdominal x-rays and abdominal CT scan did not reveal signs of intestinal obstruction. Saline enemas did not work. During one evening shift a senior surgeon

examined the patient and ordered the nurse to give 2 fleet enemas. The surgeon and the nurse knew that the patient had renal failure but the surgeon thought that this single dose would do no harm. Both the physician and the nurse were unaware that fleet enema contained a phosphate compound.

Three hours later the patient complained of malaise, and few hours later she became somnolent and her blood pressure dropped to 80/40 mmHg. The consultant nephrologist who was called immediately thought of hyperphosphatemia as the cause of her condition and serum phosphorus level was 19 mg/dL (N= 2.5-4.5 mg/dL). The patient was treated with dopamine infusion and hemodialysis. Her

condition improved gradually and she survived this serious adverse event.

Discussion

Inorganic phosphate salts are readily absorbed from the gastrointestinal tract and can cause hyperphosphatemia even in individuals with normal functioning kidneys. Severe hyperphosphatemia results in acute hypocalcemia and hypomagnesemia. Tetany, seizures, bradycardia, prolonged QT interval, dysrhythmias, coma, and cardiac arrest are the serious consequences (2-10).

Fleet enema is also used in the pediatric EDs for treating constipation in children, and reports on hyperphosphatemia and cardiovascular decompensation have been published in the pediatric literature (11-18). Harrington and Schuh suggested guidelines for use of fleet enema in the pediatric ED (19).

Treatment of severe hyperphosphatemia includes fluid administration, vasoactive drugs infusion, correction of hypocalcemia and hypomagnesemia and dialysis. One must carefully weigh the risk of hyperphosphatemia before ordering a fleet enema to the patient.

References

1. C. B. Fleet Co, Inc. Fleet enema prescribing information. In: Huff BB, ed. Physicians' desk reference. 43rd ed. Oradell, NJ: Medical Economics Company Inc 1989; (Suppl B):942.
2. Martin RR, Lisehora GR, Braxton M Jr et al. Fatal poisoning from sodium phosphate enema: case report and experimental study. *JAMA* 1987; 257:2190-92.
3. Reedy JC, Zwiren GT. Enema-induced hypocalcemia and hyperphosphatemia leading to cardiac arrest during induction of anesthesia in an outpatient surgery center. *Anesthesiology* 1983; 59:578-9.
4. Nir-Paz R, Cohen R, Haviv YS. Acute hyperphosphatemia caused by sodium phosphate enema in a patient with liver dysfunction and chronic renal failure. *Ren Fail* 1999; 21(5):541-
5. Grosskopf I, Graff E, Charach G, Binyamin G; Spinrad S; Blum I. Hyperphosphataemia and hypocalcaemia induced by hypertonic phosphate enema--an experimental study and review of the literature. *Hum Exp Toxicol* 1991; 10(5):351-5.
6. Farah R. Fatal acute sodium phosphate enemas intoxication. *Acta Gastroenterol Belg* 2005; 68(3):392-3.
7. Post SS. Hyperphosphatemic hypocalcemic coma caused by hypertonic sodium phosphate (fleet) enema intoxication. *J Clin Gastroenterol* 1997; 24(3):192.
8. Knobel B, Petchenko P. Hyperphosphatemic hypocalcemic coma caused by hypertonic sodium phosphate (fleet) enema intoxication. *J Clin Gastroenterol* 1996; 23(3):217-9.
9. Pitcher DE, Ford RS, Nelson MT, Dickinson WE. Fatal hypocalcemic, hyperphosphatemic, metabolic acidosis following sequential sodium phosphate-based enema administration. *Gastrointest Endosc* 1997; 46(3):266-8.
10. Sutters M, Gaboury CL, Bennett WM. Severe hyperphosphatemia and hypocalcemia: a dilemma in patient management. *J-Am-Soc-Nephrol* 1996; 7(10):2056-61.
11. Davis R, Eichner J, Bleyer W, et al. Hypocalcemia, hyperphosphatemia, and dehydration following a single hypertonic phosphate enema. *J Pediatr* 1977; 90:484-485.
12. Loughnan P, Mullins G. Brain damage following a hypertonic phosphate enema. *Am J Dis Child* 1977; 131:1032.
13. Craig JC, Hodson EM, Martin HC. Phosphate enema poisoning in children. *Med JAust* 1994; 160(6):347-51.
14. Helikson,-M-A; Parham,-W-A; Tobias,-J-D. Hypocalcemia and hyperphosphatemia after phosphate enema use in a child. *J-Pediatr-Surg* 1997; 32(8):1244-6.

15. Ismail EA, Al-Mutairi G, Al-Anzy H. A fatal small dose of phosphate enema in a young child with no renal or gastrointestinal abnormality. *J Pediatr Gastroenterol Nutr* 2000; 30(2):220-1.

16. Walton DM, Thomas DC, Aly HZ, Short BL. Morbid hypocalcemia associated with phosphate enema in a six-week-old infant. *Pediatrics* 2000; 106(3):E37.

17. Everman DB, Nitu ME, Jacobs BR. Respiratory failure requiring extracorporeal membrane oxygenation after sodium phosphate enema intoxication. *Eur J Pediatr* 2003; 162(7-8):517-9.

18. Davis RF, Eichner JM, Bleyer A et al. Hypocalcemia, hyperphosphatemia, and dehydration following a single hypertonic phosphate enema. *J Pediatr* 1977; 90:484-5.

19. Harrington L, Schuh S. Complications of Fleet enema administration and suggested guidelines for use in the pediatric emergency department. *Pediatr Emerg Care* 1997; 13(3):225-6.

Competing Interests: None Declared

Funding: None

This manuscript has been peer reviewed

Correspondence:

Hay Emile MD
Assistant Director General
Risk Management Unit
Barzilai Medical Center
Ashkelon, 78306
ISRAEL
Telephone: 972-8-6745600
Fax: 972-8-6745509

E-mail: haye@barzi.health.gov.il