The Safety of Mineral Oil in the Treatment of Constipation—A Lesson from Prolonged Overdose

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Summary: There have been concerns regarding the interference in the absorption of fat-soluble vitamins in long-term treatment with mineral oil; however, there is no clear evidence in the literature to support this claim. We present a case report illustrating the effect of prolonged (5 months) large doses of mineral oil on the fat-soluble vitamin absorption in a 17-year-old girl.
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Introduction

Constipation is a common symptom affecting up to 28% of the Western population.[1,2] The numbers are even higher for children.[1,2] It is estimated that approximately 3% of general pediatric outpatient visits and 25% of pediatric gastroenterology consultations are related to constipation.[3]

The treatment of childhood chronic constipation involves the following three modalities: (1) Parent and patient education regarding bowel evacuation and often includes behavioral modification; (2) nutritional management, which includes adding fiber and fluid to the diet and reducing the amounts of starch and dairy products;[3,4] and (3) medical treatment, which consists of three phases: disimpaction, sustained evacuation, and weaning from medication.[3,4] The main options in maintaining sustained evacuation are laxatives (magnesium hydroxide, lactulose, sorbitol, polyethylene glycol) and oil lubricants.[3,5]

Extensive experience involving long-term use of these agents has been reported, which has shown that these therapies are effective and safe. Since the previously mentioned therapies seem to be equally efficacious, the choice among them is based on safety, cost, the child's preference, ease of administration, and the practitioner's experience.[3]

Mineral oil is a mixture of hydrocarbons obtained from petroleum. It is indigestible and is only absorbed to a negligible extent. It softens fecal contents by lubrication and retardation of water absorption.[6] It is considered as a safe medication; nevertheless, if aspirated it can result in lipoid pneumonia and therefore its use is limited to above the age of 1 year. There have been concerns regarding the interference in the absorption of fat-soluble vitamins in long-term treatment,[2-4,6-9] however, there is no evidence in the literature to support this claim.[3,4,6]

We present a case report illustrating the effect of prolonged large doses of mineral oil on the fat-soluble vitamin absorption in a 17-year-old girl.

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Case Report

The patient was a 17-year-old girl with chronic constipation. Her main complains were abdominal pain and discomfort relieved only after defecation over the preceding 5 years. The bowel movements were not spontaneous and only occurred following oral bisacodyl or enemas. She had a normal appetite and had no history of vomiting or weight loss. Physical examination revealed a soft abdomen with heavily loaded colon; however, the rectal examination did not reveal fecal impaction or fissures. Her weight was 50 kg and height 160 cm. Her relevant laboratory results were normal.

She was admitted to the hospital for disimpaction and evacuation with a polyethylene glycol (PEG) solution. She was discharged with a recommendation for 30 mL of mineral oil twice daily with enemas as needed. This resulted in a daily defecation with several incidents of encopresis, and therefore the mineral oil dose was lowered to 25 mL twice daily.

On follow-up visit 6 months later, it transpired that the patient had decided to increase the dosage of mineral oil to 400 mL daily for at least 5 months. This was accompanied by a high oily stooling frequency at first, but later one or two soft daily stools became her normal routine. Defecation was painless. No abnormalities were found on physical examination and mineral oil doses were gradually lowered and an alternative treatment with a PEG laxative was initiated. To exclude fat-soluble vitamins malabsorption we studied, their serum levels. Vitamin A and E levels were 43 mg/dL (30–80 mg/dL) and 5.4 mg/dL (5–20 mg/dL), respectively. Calcium, phosphorus and alkaline phosphatase levels, reflecting vitamin D status, and prothrombin time level reflecting vitamin K status, were within normal limits.

Discussion

In their chapter on constipation, Croffie and Fitzgerald[7] suggest a dose of 15 mL to 45 mL twice daily, depending on the patient's age. They recommend that mineral oil should be given between meals, preferably in the midafternoon and at bedtime, so as to not interfere with the absorption of fat-soluble vitamins. However, due to its unpalatable taste, this recommendation is not always feasible. Baker et al,[3] in the North American Society for Pediatric Gastroenterology and Nutrition position statement on constipation, suggest a maintenance dose of 1 to 3 mL/kg/day. This girl consumed 3 to 4 times the maximum recommended dose.

Clark et al[6] studied 25 children with chronic constipation during mineral oil therapy. These children underwent serial monitoring of serum beta-carotene, retinol (vitamin A1), and alpha-tocopherol (vitamin E) levels. Mineral oil was administered between meals. Patients were monitored for up to 4 months of therapy. Mean serum beta-carotene levels fell from 55.7 ± 26.0 µg/dL to 35.9 ± 22.1 µg/dL (normal values 40–130 µg/dL) after the first month of mineral oil therapy and remained depressed throughout the remainder of the study. Serum alpha-tocopherol levels remained unchanged. There was a modest increase in serum retinol levels, especially after 3 months. They concluded that a short course of mineral oil can induce a reduction in the serum level of beta-carotene, but has no effect on serum levels of retinol and alpha-tocopherol. Ballantine et al[10] found no significant differences in prothrombin time or serum retinol and alpha-tocopherol levels after a period of 6 years of therapy.

Our case would support the position that even massive overdosage of mineral oil for a period as long as 5 months does not have any significant impact on vitamin ADEK levels in an adolescent. Taken together with previous studies results supports the safety of mineral oil in regular doses. This observation does not necessarily exclude the possibility that in smaller, rapidly growing children, a prolonged overdose of mineral oil might be detrimental.

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REFERENCES

1. Di Lorenzo C. Childhood constipation: finally some hard data about hard stools! *J Pediatr.* 2000;136:4-7.
2. Lembo A, Camilleri M. Chronic constipation. *N Engl J Med.* 2003; 349:1360-1368.
3. Baker SS, Liptak GS, Colletti RB, et al. Constipation in infants and children: evaluation and treatment. A medical position statement of the North American Society for Pediatric Gastroenterology and Nutrition. *J Pediatr Gastroenterol Nutr.* 1999;29:612-626.
4. Abi-Hanna A, Lake AM. Constipation and encopresis in childhood. *Pediatr Rev.* 1998;19:23-30.
5. Bishop WP. Miracle laxative? *J Pediatr Gastroenterol Nutr.* 2001;32:514-515.
6. Clark JH, Russell GJ, Fitzgerald JF, et al. Serum beta-carotene, retinol, and

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alpha-tocopherol levels during mineral oil therapy for constipation. *Am J Dis Child*. 1987;141:1210-1212.

7. Croffie JMB, Fitzgerald JF. Hypomotility disorders. In: Walker WA, Durie PR, Hamilton RJ, Walker-Smith JA, Watkins JB, eds. Pediatric Gastrointestinal Disease. BC Decker, Hamilton, Ontario, Canada; 2003:830-843.
8. Locke GR III, Pemberton JH, Phillips SF. American Gastroenterological Association Medical Position Statement: Guidelines on Constipation. *Gastroenterology*. 2000;119:1761-1766.
9. Wald A. Constipation. *Med Clin North Am*. 2000;84:1231-1246, ix.
10. Ballantine TVM, Zeigler D, Greecher CP. The effect of mineral oil on fat soluble vitamin levels. *J Parenter Enteral Nutr*. 1986;10:18.

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