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### Authors

Vilke, Gary M  
DeMers, Gerard  
Patel, Nilang  
et al.

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## Original Contributions

### SAFETY AND EFFICACY OF MILK AND MOLASSES ENEMAS IN THE EMERGENCY DEPARTMENT

Gary M. Vilke, MD, Gerard DeMers, DO, DHSC, MPH, Nilang Patel, MS, and Edward M. Castillo, PHD

Department of Emergency Medicine, University of California, San Diego Medical Center, San Diego, California

Reprint Address: Gary M. Vilke, MD, Department of Emergency Medicine, UC San Diego Medical Center, 200 West Arbor Drive Mailcode #8676, San Diego, CA 92103

**Abstract—Background:** Increased scrutiny is occurring from regulatory agencies about the use of nonsterile enema preparations in the emergency department (ED) for constipation. This includes the “off-label” use of milk and molasses (M&M) enemas, as there are no reported data in the medical literature to determine safety and efficacy. **Objectives:** To evaluate the success and complication rates of administering M&M enemas in the ED. **Methods:** This was a structured retrospective study at two EDs over 8 years. **Primary success** was defined as the patient having a bowel movement. **Secondary measures of success** included improved pain score by 2 or more points or lowering of a heart rate initially over 100 beats/min by 20 or more beats/min. **Complications included:** hemodynamic compromise, increased pain, electrolyte disturbances, bacteremia, bowel perforation, rectal pain or bleeding, cardiac dysrhythmias, anaphylaxis, electrolyte disturbances, dizziness or syncope, or hospital admission for issues surrounding enema. **Results:** There were 2013 enemas given, of which 261 were M&M enemas; 214 were given alone. **Success rates** defined only as bowel evacuation for M&M enemas alone were 87.9% (188/214) and, when used after other treatment failures, were 82.4% (28/34) successful. **Five additional patients** improved with the secondary measures (90.2% success). **There were 8/261 complications (3.1%),** of which four had an increased heart rate, two had decreased blood pressure, one had an increased pain score, and one subsequently developed a fever. **Conclusion:** M&M enemas have a low complication rate when used in the ED. © 2015 Elsevier Inc.

**Keywords—**constipation; enema; resource utilization; nausea/vomiting

#### INTRODUCTION

Constipation is a common presenting complaint in the emergency department (ED). There are multiple treatment options for use in the ED and directed outpatient therapy to relieve constipation, including laxatives and enemas. The milk and molasses (M&M) enema is one treatment option that has been frequently used, but lacks published research to support the safety and efficacy for its use.

The M&M enema is reported to work by the action of the sugar in the enemas affecting the intestinal lining and producing gas, which distends the intestines and causes pressure, peristalsis, and subsequent evacuation. A low-volume enema <300 cc, when given high (12 inches) and held for 20 min produces the best results (1). The only published work on the M&M enema was performed in a pediatric population and is a case series of potential complications, which included 5 patients with significant hemodynamic compromise and the death of one child (2).

The purpose of this study is to evaluate the success and complication rates of administering M&M enemas in the treatment of adults for constipation.

#### MATERIALS AND METHODS

This study was a structured retrospective cohort chart review by a trained data abstractor of all adult patients aged 18 years or older from July 15, 2002 and July 15, 2010

who received an enema in the ED. The abstractor was a medical student who was trained by the senior investigator how to specifically navigate the electronic medical records (EMR) and utilize the standardized data abstraction tool. The study sites were two EDs, one academic urban and one community, with a combined annual census of approximately 60,000 patients. The emergency physician determined whether or not to use an enema and if so, which enema was to be utilized.

Data were collected by using the EMR to screen for patients and vital signs. Complications and success were specifically searched for in the medical record notes, which included physician and nursing notes as well as the vital signs and laboratories. The patients were evaluated in several groups. The groups included those who received an M&M enema only, those who received an M&M enema after another type of enema or treatment for constipation such as an oral agent, and those who had an M&M enema and were subsequently treated with a different enema. The groups were evaluated separately to determine the efficacy and complication rates of the M&M enema alone and in conjunction with other enemas.

Success and complication rates were defined a priori by using other studies on enemas and expanding to other potential complications that could be linked to enemas as determined by the investigators. Primary success was determined by obtaining a bowel movement. Secondary successful outcomes included relieving flatus, an improved pain score of 2 points or more on the 0–10 pain scale, or a lowering of heart rate (HR) that started over 100 beats/min by 20 beats/min after the use of M&M enema. A complication was defined as the presence of hemodynamic compromise, including a systolic blood pressure (SBP) drop of below 90 mm Hg or an increase in HR of 20 beats/min or more, electrolyte disturbances including hypokalemia, bowel perforation, infectious and inflammatory etiologies such as transient bacteremia, development of fever or leukocytosis, cardiac dysrhythmias, anaphylaxis manifesting as anasarca and edema, and nonspecific symptoms including weakness, syncope, anxiety, nausea, vomiting, diarrhea, pain in the head, back, flank and groin, and urinary pain with or without hematuria.

This study was approved by the University of California, San Diego Human Subjects Protection Program. Descriptive statistics are presented utilizing SPSS (IBM, Armonk, NY).

## RESULTS

Over the 8-year study period, there were 2013 enemas given, of which 261 were M&M enemas. Of these 261 patients, 214 received only an M&M enema, 34 were given after other types of enemas or treatments, and 13 were

given prior to a secondary non-M&M enema. Of the 34 that received other treatments prior to the M&M enema, 14 received the M&M enema after the administration of a Fleet enema (C.B. Fleet Company, Inc., Lynchburg, VA), 4 received it after a soapsuds enema, 5 received it after magnesium citrate, 2 received it after lactulose, 2 received it after a mineral oil enema, and 7 received multiple enemas combined prior to the M&M enema. Thirteen patients received an M&M enema prior to the use of a subsequent enema.

Comprehensively, the use of M&M enema demonstrated an 85% (223/261) success rate of the primary measured outcome of having a bowel movement. An additional 5 patients met the secondary outcome measures, all of which had a lowering of their pain scores of two or more points. Moreover, the population of patients that received only an M&M enema demonstrated an 87.5% (188/214) success rate. When used after other treatment failures, M&M enemas were 82.4% (28/34) successful. A list of the primary outcome measure of having a bowel movement that occurred when M&M enemas were used after other treatments is shown in [Table 1 \(1,3,4\)](#).

Complications in the patients who received M&M enemas included 2 (0.77%) patients that developed hypotension (SBP drop below 90 mm Hg), 2 (0.77%) patients that developed increased HR (an increase of 20 beats/min), one (0.38%) patient that subsequently developed a fever of 38.9°C (102°F), and one (0.38%) patient that developed worsening abdominal pain that prompted hospital admission. In each of these patients, the true relationship between the enema and the complication was unclear.

In the groups that received an M&M enema in combination with other enemas, 2 patients developed an HR increase of 20 beats/min. The rest of the populations, including those that received M&M after Fleet, after soap suds, magnesium citrate, lactulose, and mineral oil did not demonstrate any complications.

**Table 1. The Success Rates of M&M Enemas Alone and After Other Types of Treatments**

Method	Successful BM/ Total Treated	%
M&M only	188/214	87.9%
M&M after Fleet	12/14	85.7%
M&M after soap suds	4/4	100%
M&M after mag citrate	4/5	80%
M&M after 2 or more enemas	5/7	71.4%
M&M after lactulose	1/2	50%
M&M after mineral oil	2/2	100%
Total	28/34	82.4%

M&M = milk and molasses; BM = bowel movement.

**Table 2. Protocol Used for Preparing and Administering the Milk and Molasses Enema**

1. Explain procedure to patient, and ensure that there is a commode, or that access to a bathroom is readily available.
2. Obtain MD order for milk and molasses (M&M) enema.
3. Review allergies with patient: if there is a history of lactose intolerance, the patient is NOT to receive an M&M enema (1).
4. Mix 16 oz. warm molasses and 16 oz. warm milk together and place in an enema bag. A goal temperature for the M&M is 39.4°C (103°F). Never inject anything into the patient's colon hotter than 46.1°C (115°F) (3).
5. Have patient lie on his/her stomach with knees pulled underneath him/her.
6. Insert the lubricated tip 1½ inches to 2 inches into the rectum.
7. Maintain the enema bag no more than 2 feet above the level of the patient's bottom.
8. When bag is empty, remove the tube.
9. Encourage the patient to retain the enema as long as possible; however, it is not uncommon for the bowel to react almost immediately to the enema.
10. M&M enemas produce large amounts of gas in the large intestine, which can cause severe cramping (4).

## DISCUSSION

The preparation of the M&M enema in our ED by nursing is noted in Table 2. This method had been used for over 8 years, but was recently removed from the formulary after a regulatory body site visit to the ED deemed that the enema preparation was not appropriate for several reasons, including that the preparation was not sterile, and that this was considered an off-label use of milk and molasses. They also cited a lack of published data on the use of the M&M enema.

Review of the literature reflects a dearth of published work on enemas in general, and M&M enemas specifically (5). The work by Walker described five children who suffered hemodynamic compromise after being administered an M&M enema (2). The children ranged from 7 months to 6 years of age. They were all already hospitalized for other medical conditions, and a number had underlying baseline medical conditions including chromosomal abnormalities. There are no previous reviews of the use, including efficacy or complications, of M&M enemas in adults in general or in the outpatient setting of an ED specifically.

Wallaker et al. reviewed the use of M&M enemas in children aged 2 to 17 years and found a success rate of 88%, which was similar to the findings in our study of adults (6). They also noted that success rate was found to vary with age and amount of enema given. Complications were not defined, but they did report that minimal side effects occurred. Similarly, Hansen et al. studied children over a 1-year period and compared efficacy of treatment between M&M enemas and sodium phosphate enemas (7). They found similar treatment effects between the two enemas, but did note that six cases of treatment failures after sodium phosphate enemas compared with only one failure after M&M enemas. Most of the literature seems to revolve around the use of M&M enemas in the pediatric population. Ours is the first large study to evaluate use in an adult ED population.

## Limitations

There are limitations of our study that need to be discussed. There are the obvious limitations that occur with the use of a retrospective chart review, including the completeness of the medical record. Definitions of success and complications were made a priori, most based on other studies, but several were created by the investigators in collaboration with pharmacists, nurses, and physicians to try to make sure all possible negative effects of an enema could be assessed. The availability of data in the medical record in a retrospective review is limited to physician and nurse documentation. Despite the numbers of patients reported in this study, there are not enough patients to definitively conclude that M&M enemas are safe. Although the complication rate is likely very low, many more patients would need to be included to conclude that this is a safe practice.

## CONCLUSIONS

M&M enema utilization has a low rate of complication when used in the ED.

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**ARTICLE SUMMARY****1. Why is this topic important?**

Enemas are a frequently used treatment in the emergency department (ED), but there is a lack of published literature on safety and effectiveness.

**2. What does this study attempt to show?**

This study attempts to evaluate the success and complications of milk and molasses enemas.

**3. What are the key findings?**

Milk and molasses enema utilization has a high success rate in relieving constipation and a relatively low rate of complication when used in the ED.

**4. How is patient care impacted?**

Milk and molasses enemas in the ED can be safely used for patients with constipation.