ORIGINAL RESEARCH

Are Milk and Molasses Enemas Safe for Hospitalized Adults? A Retrospective Electronic Health Record Review

Findings indicate that this treatment is generally safe.

Constipation is a common condition generally said to exist when a person has reduced frequency of "normal" bowel evacuation, or fewer than three bowel movements per week; reduced ease of passage may also be present.[1] Chronic constipation, persisting several weeks or more, affects millions of people worldwide. In 2009, Tack and Müller-Lissner reported that between 2% and 27% of people in Western countries suffer from chronic constipation[2]; it's likely the condition is widely underreported since many people don't seek treatment. Constipation has been associated with decreased quality of life,[3,4] and nurses in a variety of settings routinely encounter this condition. There has long been a clear need for a bowel regimen that can prevent or treat constipation throughout the continuum of care and across settings.[5] But research indicates that patients are often disappointed by standard medical treatments, which can include increased fluid intake, laxative agents, and stool softeners or bulking agents. A recent literature review found that despite such treatments, "only about half of the patients [were] satisfied with the results obtained."[6] Even with newer treatment modalities such as biofeedback, chronic constipation continues to be a concern.[4]

Moreover, constipation creates a staggering financial burden for the health care system. An analysis of data in the National Inpatient Sample database found that, from 1997 to 2010, the total annual costs of caring for patients with a primary discharge diagnosis of constipation rose from $188 million to nearly $852 million.[7] The analysis also found that the frequency of such diagnosis more than doubled in that time, from 6.1 to 12.4 per 10,000 discharges. Clearly constipation continues to be a challenging problem.

BACKGROUND

For hospitalized adults with unresolved constipation, nurses have often resorted to a historic and trusted treatment option: the administration of a milk and molasses enema. Although its origins are unclear, a physician named Levi Halsey reported that during the 1880s he'd witnessed his grandfather, a physician with a degree from Yale University Medical School, "using this formula frequently and . . . stating to me that it was an old and valuable therapeutic measure."[8] Although the exact mechanism is unclear, Vilke and colleagues have reported that the milk and molasses sugars "affect" the intestinal lining, producing gas; the resulting distention and pressure prompt peristalsis and consequential evacuation.[9]

The use of milk and molasses enemas for severe constipation that has not resolved with standard measures is common practice in both academic and nonacademic health care centers worldwide. Historically, nurses have used such enemas to preempt surgical intervention. Though there are anecdotal reports

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ABSTRACT

Background: Constipation in hospitalized patients is common. As a treatment of last resort for unresolved constipation, a milk and molasses enema is often used by nursing staff. But there has been little research investigating the safety and efficacy of this approach.

Purpose: The purpose of this retrospective study was to evaluate the safety of milk and molasses enemas for hospitalized adults with constipation that remained unresolved after standard treatment options were exhausted.

Methods: Data were extracted from the electronic health records (EHRs) of 615 adult patients who had received a milk and molasses enema between July 2009 and July 2013 at a large midwestern academic medical center. Data analysis occurred for a random subset of this group.

Participant characteristic variables included age, sex, admitting diagnosis, diet orders, medications, laxatives and enemas administered before the milk and molasses enema, and laboratory values. Serious complication variables included bacteremia, bowel perforation, electrolyte abnormalities, allergic reaction, abdominal compartment syndrome, cardiac arrhythmia, dehydration, and death.

Findings: The final sample of 196 adults had a mean age of 56 years; 61.2% were female and 38.8% were male. Of 105 admitting diagnoses, the most frequent (9.7%) was abdominal pain, unspecified site. Of the 14 discharge dispositions, the most frequent was home or self-care (50.5%). A laxative order was present for 97.4% of patients and a stool softener order was present for 86.2%. Sodium and potassium levels remained within normal limits during hospitalization. For the subset of patients who had these values measured within 48 hours before and after milk and molasses enema administration, no significant changes were found. No cases of nontraumatic abdominal compartment syndrome or other serious adverse enema-related events were documented in the EHR.

Conclusions: No safety concerns were identified from this retrospective EHR review of hospitalized adults who received a milk and molasses enema for constipation relief. The findings indicate that this treatment is safe, although further study examining its efficacy in this population is needed.

Keywords: constipation, enema, milk and molasses, patient safety

describing the effectiveness of such enemas, we found little mention of their use in the literature describing available treatment options.

Two studies considered the use of milk and molasses enemas in pediatric populations, but these produced contradictory findings. After conducting a retrospective review of pediatric electronic health records (EHRs) at a large urban medical center, Walker and colleagues concluded that the use of milk and molasses enemas in children could result in "significant hemodynamic compromise."[10] But a retrospective EHR review by Wallaker and colleagues found that milk and molasses enemas relieved constipation safely and effectively, with minimal adverse effects, in patients presenting to a suburban pediatric ED.[11]

Given the long-standing use of milk and molasses enemas by nurses and the scant evidence to support such use, our research team decided to investigate further. We wanted to learn whether this approach is actually safe and effective or more of a "sacred cow"—a long-held nursing practice "considered routine and above dispute, regardless of evidence to the contrary."[12] Because patient safety is paramount, we decided to begin with a phase one study to establish whether milk and molasses enemas are safe for use in hospitalized adults. If appropriate, a randomized controlled trial would then be conducted to examine both the safety and efficacy of such enemas in this population.

Study purpose. The purpose of this phase one study was to determine the safety profile of milk and molasses enemas administered to hospitalized adults for severe constipation that has not resolved with standard treatment measures.

METHODS

Design and setting. A retrospective EHR review was chosen, as it offered no risk to patients. The study setting was a large midwestern academic medical center. Before data collection began, approval for the study was obtained from the organization's institutional review board, which also granted a waiver of informed consent.

Sample and intervention. Six hundred and fifteen adult patients with a milk and molasses enema order in the EHR between July 2009 and July 2013 were identified. From this group, a random subset of 200 patients was selected for data analysis. Four of these patients were excluded from the final sample because they were under the age of 18 years.

Table 1. Participant Characteristics (N = 196)

Characteristic	Mean (SD)	Range
Age, years	56 (17)	20–90
	n	%
Sex		
Male	76	38.8
Female	120	61.2
Emergency admission		
Yes	104	53.1
No	92	46.9
Primary admission diagnosis[a]		
Abdominal pain, unspecified site	19	9.7
Constipation, unspecified	14	7.1
Anorexia nervosa	13	6.6
Nausea with vomiting	13	6.6
Intestinal obstruction, unspecified	8	4.1
Discharge disposition[b]		
Home or self-care	99	50.5
Skilled care facility	26	13.3
Home with home health care	19	9.7
Inpatient rehabilitation facility	19	9.7
Deceased	9	4.6

[a]The top five diagnoses from 105 primary admission diagnoses in the study sample.
[b]The top five discharge dispositions from 14 options on the electronic health record drop-down list at the time of the study.

During the study period, the formulation for a milk and molasses enema may have differed on various units. The specific proportion of milk to molasses and the amounts used for these enemas aren't given in the EHR orders. That said, the current formulation uses a ratio of 1:1 and is made with 240 mL molasses and 240 mL whole milk, which are provided by the organization's dietary services.

Variables of interest included patient demographic and presenting medical characteristics, along with three safety outcomes associated with milk and molasses enemas. Patient characteristics included age, sex, admitting diagnosis, dietary orders, medications, laxatives and enemas given before the milk and molasses enema, and laboratory values. Documented comorbidities included anemia, chronic pulmonary disease, congestive heart failure, diabetes, hypertension, liver disease, peripheral vascular disorders, renal failure, and valvular disease. Safety outcomes of interest included bloating, flatus, and bleeding; serious complications including allergic reactions, bacteremia, bowel perforation, electrolyte abnormalities, abdominal compartment syndrome, cardiac arrhythmia, dehydration, and death; and electrolyte (sodium and potassium) changes.

Data collection and analysis. A software tool developed by an industry partner (Starmaker, Park Street Solutions, Naperville, IL) was used to extract data from the EHR for all patients with an order from a licensed independent practitioner for milk and molasses enema administration. Extracted data were then exported into an Excel spreadsheet. Given the number of such enemas administered, we decided to randomly select 200 records for detailed analysis. Randomization was done using the Starmaker tool. For a subset of patients whose sodium and potassium levels were measured within 48 hours before and after the milk and molasses enema, a manual EHR review was conducted by a member of the research team.

Because this study focused on the safety of the milk and molasses enemas as documented in the EHR, it was not powered to assess and detect their effects. Descriptive and inferential statistics were calculated using IBM SPSS Statistics for Windows, Version 24. Changes in sodium and potassium levels, as measured within 48 hours before and after enema administration, were examined using paired *t* tests.

RESULTS

Sample characteristics. The final sample included 196 adults with a mean age of 56 years; 120 (61.2%) were female and 76 (38.8%) were male. A total of 105 admitting diagnoses were documented, with the most frequent being abdominal pain, unspecified site (19 patients; 9.7%). The most frequent discharge disposition was home or self-care (99 patients; 50.5%). For more detailed demographic data, see Table 1. Participant comorbidities were based on International Classification of Diseases, Ninth Revision (ICD-9) codes retrieved from the EHR. Valvular disease was the most common by far, afflicting 181 patients (92.3%). For a comprehensive list of participant comorbidities, see Table 2. In the study sample, 191 (97.4%) had a laxative order and 169 (86.2%) had a stool softener order.

Findings. Concerning serious complications, there was no documentation in the EHR of milk and molasses enema–associated allergic reactions, bacteremia, bowel perforation, electrolyte abnormalities, abdominal compartment syndrome, cardiac arrhythmia, dehydration, or death.

Mean laboratory values were extracted for the full hospital length of stay for the study sample. Sodium and potassium levels were not ordered for all patients. Thus, for 191 patients, the mean sodium level was 137.7 mEq/L (SD, 3.53); for 193 patients, the mean potassium level was 3.84 mEq/L (SD, 0.33). These values are within normal limits. For the subset of patients whose sodium and potassium levels were

measured within 48 hours before and after the milk and molasses enema—35 and 42 patients, respectively—no significant changes in these levels were seen. See Table 3 for data on this subset.

DISCUSSION

Among the 196 hospitalized patients whose EHRs were analyzed, no serious complications occurred following administration of milk and molasses enemas; and their mean sodium and potassium levels remained within normal limits during their hospitalization. In the subset, mean sodium and potassium levels as measured 48 hours before and after enema administration remained essentially unchanged. These findings are consistent with those of Vilke and colleagues, who described minor adverse effects among just six (2.3%) of 261 adult patients in the ED who received a milk and molasses enema following failure of other treatment options.[9] They also reported an overall constipation resolution rate of 85% after milk and molasses enema administration. Our study extends the evidence for such enemas' safety to hospitalized adults, and suggests that further study on efficacy is warranted. Our findings also support those of Wallaker and colleagues, who found that of 413 pediatric patients who were given milk and molasses enemas in the ED, 80% to 88% (depending on dose) had successful resolution of constipation with no adverse effects.[11]

All of these findings are in contrast to those from five pediatric case studies reported by Walker and colleagues, who described serious complications occurring after the administration of milk and molasses enemas.[10] But it's important to note that all five patients were acutely ill, indicating that such enemas should be used with caution in very sick patients. In our study, the sample population had numerous significant and diverse comorbidities, according to ICD-9 codes retrieved from the EHR, yet administration of milk and molasses enemas did not result in either significant complications or hemodynamic instability.

To our knowledge, this study is the first of its kind to analyze a sample of hospitalized adults who have received a milk and molasses enema. The results provide evidence that milk and molasses enemas can be safely administered in this population. Research on the efficacy of such enemas is also warranted, and our team plans to investigate further.

Limitations. The generalizability of the findings is limited to hospitalized adults. Also, the data were extracted from records at one large academic medical center; it's possible that findings involving multiple sites might differ. Lastly, during the study period it's possible that enema formulations may have varied.

Nursing implications. Our findings speak to the importance of identifying clinical problems and asking questions, especially regarding "sacred cow" practices that may or may not hold up to scrutiny. Frontline nurses are well positioned to do so; indeed, this is an essential way to ensure the quality and safety of patient care. Such problems and questions can be investigated through approaches that consider the existing evidence and employ research methods when existing evidence is scant.

CONCLUSIONS

As the burden of constipation on the health care system continues to grow, the need for treatment modalities that work safely and effectively becomes ever more pressing. This study's findings indicate that milk and molasses enemas are safe for administration to adult patients, and other relevant studies (though few in number) appear to support this. Nurses should feel comfortable encouraging the use of milk and molasses enemas as a treatment option in cases of unresolved

Table 2. Participant Comorbidities (N = 196)

Comorbidity	n	%
Valvular disease	181	92.3
Fluid and electrolyte disorders	85	43.4
Hypertension, uncomplicated	70	35.7
Solid tumor, without metastasis	46	23.5
Chronic pulmonary disease	39	19.9
Diabetes, uncomplicated	30	15.3
Metastatic cancer	29	14.8
Depression	23	11.7
Renal failure	20	10.2
Hypothyroidism	19	9.7
Weight loss	18	9.2
Congestive heart failure	16	8.2
Hypertension, complicated	14	7.1
Cardiac arrhythmias	11	5.6
Drug abuse	11	5.6
Other neurological disorders	10	5.1
Paralysis	9	4.6
Diabetes, complicated	8	4.1
Peripheral vascular disorders	8	4.1
Deficiency, anemia	7	3.6
Liver disease	7	3.6
Psychoses	6	3.1
Coagulopathy	5	2.6
Blood loss, anemia	4	2
Pulmonary circulation disorders	4	2
Rheumatoid arthritis	3	1.5
Alcohol abuse	2	1

Table 3. Potassium and Sodium Levels as Measured Within 48 Hours Before and After Milk and Molasses Enema Administration

	n	Mean (SD)	Mean (SD) Change Score	Confidence Intervals	*P* Value
Potassium	42		0.04 (0.52)	−0.125 to 0.201	
Before enema		3.85 (0.45)			0.47
After enema		3.81 (0.40)			0.64
Sodium	35		−0.91 (3.90)	−2.253 to 0.425	
Before enema		137.89 (4.26)			−1.39
After enema		138.80 (3.25)			0.17

constipation when other treatments have failed. A thorough assessment for contraindications is still essential with acutely ill and hemodynamically unstable adult and pediatric patients. This study focused solely on the safety of milk and molasses enemas. Further research is needed to evaluate their efficacy, as well as to establish their safety in larger, more medically diverse populations. ▼

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