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The Use of Gastric Lavage in India for Poisoned Patients

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Abstract

Background: According to current international standards, gastric lavage (GL) should not be employed routinely, if ever, in the management of poisoned patients. Several clinical studies have demonstrated that the risks outweigh the benefits of this procedure. The utility of GL decreases as a function of time and is minimally effective more than one hour after toxin ingestion. Nonetheless, observational experience suggests that this procedure is still widely practiced in response to toxic ingestion in India. This study aims to quantify the prevalence and scope of gastric lavage use among healthcare providers in India.

Methods: A convenience sample of 81 acute care hospital-based health providers practicing throughout India were anonymously surveyed at the 12th Annual Conference of the Society for Emergency Medicine in Ahmedabad, India, November 2010. The survey included questions on the frequency and scope of GL use.

Results: 68 respondents (86%) claim that they use GL in treating at least 50% of their poisoned patients. 55 (70%) claim that they would use GL more than 1 hour after the ingestion of a poison, and 19 (24%) claim they would use it up to 6 hours after ingestion. 78 respondents (96%) claim they would not use lavage to treat ingestion of caustic or corrosive substances; however, substantially fewer respondents claim they would not use lavage in cases of hydrocarbons (31, 38%), large objects (22,27%), or sharp objects (47,58%).

Conclusion: Despite extensive evidence demonstrating little benefit and significant risk of GL in the management of poisoned patients, it is still practiced in India. Further research should explore why this practice is still common when less risky and more effective, evidence-based alternatives are available.

Keywords: Gastric Lavage; India; Poisoning; Toxic Ingestion; Toxicology

Introduction

Historically, the treatment of poisoned patients involved a wide variety of aggressive gastrointestinal decontamination techniques. One of the most common of these techniques is gastric lavage (GL) [1]. Standard procedure as dictated by the American Academy of Clinical Toxicology (AACT) and European Association of Poisons Centers and Clinical Toxicologists (EAPCCT) is use of a large bore orogastric tube, such as 36-40 French, with lavage performed using small aliquots of saline (200-300 ml) [2]. This is to best facilitate recovery of particulate matter [3]. The 2 main contraindications to gastric lavage include ingestion of corrosives and hydrocarbons [4]. Although not an absolute contraindication, gastric lavage is usually not performed for large objects or sharp objects [3].

The use of this practice has decreased in the United States as increasing evidence has demonstrated significant risk and little benefit to the procedure. These risks include hypoxia, infection, dysrhythmia, pneumothorax, esophageal perforation, and electrolyte imbalance [2].

Several studies have shown GL to be ineffective in altering clinical course for patients that presented more than 2-3 hours after ingestion [5,6]. Even when GL is performed only a short period after toxin ingestion, data from animal and volunteer studies show only 30% toxin removal when performed within the first 20 minutes and 8% within 60 minutes [3,7]. As such, in the rare cases that GL is performed in the United States, it is done within the first hour of toxin ingestion.

One of the major risks of GL is aspiration of the stomach contents. One study found that patients who received GL and activated charcoal did no better than those that received activated charcoal alone [8,9]. In fact, patients that received GL had an increased incidence of aspiration pneumonia despite being endotracheally intubated [9]. For patients with an altered mental status or absent gag reflex, endotracheal or nasotracheal intubation is recommended, due to the risk of aspiration [4,10].

Another risk of GL is propulsion of the gastric contents into the small intestine [11]. In one prospective, randomized study, patients were asked to swallow barium-impregnated polyethene pellets and the group randomized to GL was lavaged 10-90 minutes after ingestion [11]. 51.8% of the pellets were retained post-GL and 33.3% of these were in the small intestine [11]. This raises the concern that performing GL may facilitate drug absorption, by pushing the ingestant into the small bowel [11].

The shift from consensus-based practice to evidence-based practice in clinical toxicology prompted the AACT and the EAPCCT to recommend against the practice of GL in most cases of poisoning. Nonetheless, observational data suggests that this procedure is still widely practiced in response to toxic ingestion in India. Recent literature confirms that the shift away from GL usage in the West has not been

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replicated in much of the developing world [12,13]. In self-poisoning cases, the fatality rate in developing countries is 10-20% as compared with 0.5% in the West [12]. Thus, there is an urgent need to understand and address the management of toxic ingestion in developing nations.

This is a pilot study designed to assess the prevalence of gastric lavage use among Indian healthcare providers in response to toxic ingestion.

Methods

In 2010, the authors designed an anonymous nine-question survey (see Appendix 1) to collect information on individual respondents' rate of GL use, specific methods of GL use, and circumstances in which respondents would not consider GL. This survey was approved by the Institutional Review Board of North Shore University Hospital in Manhasset, New York, prior to its distribution.

Eighty-one Indian acute-care hospital-based providers were randomly approached and asked to complete a questionnaire at the 12th International Conference of the Society for Emergency Medicine (INTEM) in Ahmedabad, India, November 10-14, 2010. All 81 providers who were approached agreed to participate. This sample consisted of 51 attending physicians, 19 residents, 3 medical students, 1 nurse, and 7 who did not specify their professional designation.

Survey responses were recorded in Microsoft Excel and response incidence was calculated using SAS software (version 9.2) at the North Shore-Long Island Jewish Health System's Department of Biostatistics. Respondents were grouped by years of experience practicing medicine and group responses were compared using Fisher's exact test.

Results

Survey respondents represent a wide range of experience. 25% report having 0-2 years of experience practicing medicine, 22% 3-5 years, 30% 6-10 years, and 22% more than 10 years.

Of the surveyed health care professionals, a large majority (68, 86%) report using GL in treating at least 50% of their poisoned patients, and 50 of these respondents (63%) report using GL more than 90% of the time. Only 3 (4%) claim almost never to use it (see Figure 1). There was no significant correlation between years of experience and utilization of GL ($p < 0.7451$).

A majority of respondents (55, 70%) report that they would use gastric lavage more than one hour after the ingestion of a poison, and within this group, 19 (23%) claim they would use it up to six hours after ingestion. Twenty-four respondents (30%) admit that time is not a factor in the decision to perform gastric lavage (See Figure 2). In response to a question about tube size used during GL, nearly 90% (69, 87%) of respondents report using a tube smaller than 36-40 French, while a minority believe that the size of the tube is immaterial (6, 8%). The majority of respondents (47, 58%) claim to use a nasogastric tube for lavage, while four respondents (5%) claim to use either nasogastric or orogastric.

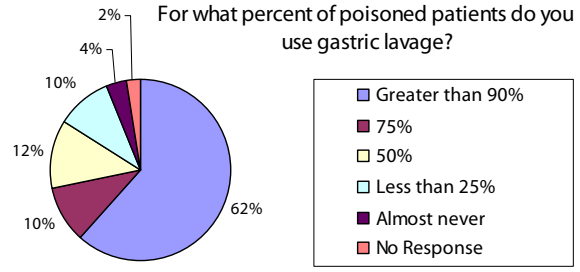
Concerning circumstances in which they would not use GL, 78 respondents (96%) claim that they would not use it to treat ingestion of caustic or corrosive substances; however, substantially fewer respondents claim they would not use lavage in cases of hydrocarbons (31,38%), large objects (22,27%), or sharp objects (47,58%).

In response to a question about airway protection during GL, 59 respondents (75%) claim that they rarely or never intubate patients prior to performing lavage. Only four (5%) claim to always intubate prior to lavage. (See Figure 3)

A large majority of respondents (56, 70%) report that they administer fluid in 200-300 mL aliquots during lavage. However, 14 respondents (19%) and 5 (7%) claim to administer the fluid in 1 L aliquots and all at once, respectively.

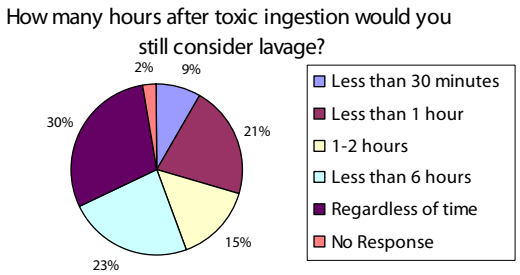
Discussion

The vast majority of respondents report using GL in India routinely with little regard for time, tube size or type of toxin (with the exception of caustic or corrosive substances) and without airway protection. However, a majority of the respondents claim to follow the AACT and



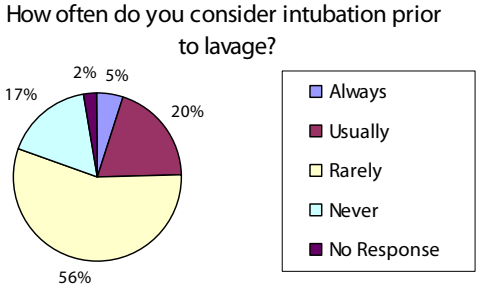
A majority of surveyed healthcare providers claim to use gastric lavage on more than 90% of the poisoned patients they treat

Figure 1: Prevalence of gastric lavage usage



A majority of surveyed healthcare providers claim they would still use gastric lavage more than 2 hours after toxic ingestion

Figure 2: Time scope of gastric lavage usage



A majority of respondents claim rarely or never to consider intubation prior to performing gastric lavage

Figure 3: Airway protection during gastric lavage.

EAPCCT recommendation that fluid be administered in 200-300 mL aliquots. This pattern of GL utilization may be explained by differences in the available emergency services, types of toxicological emergencies encountered, and the unavailability of other decontamination resources between India and the counties where recommendations for the use of GL are made.

The extended time frame of GL utilization for toxin ingestion in India may be due to the lack of a well-formed and standardized EMS system that would bring patients to the emergency department in a timely fashion [14]. Several physicians practicing in India claim that they rarely see patients in the "golden hour" that has become the standard reference for treatment in the United States.

Variation in the types of toxins ingested in India and a lack of resources may play a part in the overuse of GL and the use of small-bore decontamination tubes. Since pesticides (organophosphates) are easily accessible and inexpensive in India, many toxicological emergencies encountered are due to these poisons [15]. Because this poison is usually liquid, tube size is less important when carrying out lavage [15]. In contrast, the majority of the toxic ingestions in the Western world are due to pharmaceutical drugs, especially acetaminophen. For these solid ingestions, the tube must be larger than the pills being lavaged [3].

Likewise, the Western ingestions have effective antidotes that are easily available. In the United States, the availability of antidotes, medications, and emergency dialysis has led to a decline in the use of GL in response to toxin ingestion. In contrast, several commonly used antidotes, such as pralidoxime (2-PAM), an organophosphate and neurotoxin inhibitor, and atropine are not readily available in many hospitals in India [12].

A lack of airway equipment may be the reason that healthcare professionals in India do not focus on airway protection. As with much toxic ingestion, organophosphates often reduce mental status and result in the inability of the patient to protect their airway. Additionally, organophosphates increase secretions to a volume that is difficult to manage, which adds additional benefit to endotracheal intubation. However, lack of availability of ventilators as well as ICU beds is common in India. Without ventilators, oxygen and a higher level of care setting, endotracheal intubation cannot provide supportive care needed for patients in which definitive airway protection has been accomplished [16] and thus is no benefit from the procedure.

This lack of these resources may motivate healthcare professionals to attempt decontamination beyond the scope of recommended guidelines.

Given the lack of availability of the necessary resources to manage toxic ingestions, GL may be the only inexpensive and easily available option in developing nations. Maximizing decontamination beyond the scope of recommended guidelines may be the only treatment method available in the absence of antidotes and dialysis and may be viewed as a way to minimizing ventilator and ICU bed. However, GL comes with complications. In settings where GL is not indicated such as prolonged time elapsed since ingestion or type of toxin, the likelihood of harm may be greater than the likelihood of benefit.

Another explanation to the overuse of GL may be in that it is fundamental in the education of the treatment of toxic ingestion. As resources are increasing in India, healthcare professionals may reflexively continue to place GL in situations where it is not indicated or may be contraindicated.

This study has significant limitations due to its small sample size, and both referral and selection bias due to the manner in which the subjects were approached. Physicians attending an emergency medicine-specific conference may not be representative of a true sample of Indian emergency physicians either geographically or by emergency medicine training pedigree. Additionally, when physicians are approached to participate in such a study, the design may select out those physicians who have either well formed opinions on the subject, or who may have recently had access to some form of didactic material on the subject.

However, given these limitations and the selection of respondents from an academic conference, the cohort of respondents is likely as or more knowledgeable on issues surrounding toxicology and GL than a representative sample of Indian physicians. Also, our findings show an overwhelming number of health care providers used GL for poisoned patients. Therefore, our findings demonstrating the widespread prevalence of GL usage are likely to be replicated in a larger, more representative sample.

Despite extensive evidence demonstrating little benefit and the significant risk of GL in the management of poisoned patients, it is still frequently practiced in India. Further research should explore the availability and feasibility of safer, evidence-based alternatives to this consensus-based practice, specifically considering the spectrum of cultural and medical considerations that may affect the practice of GL in India.

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