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ANALYSIS OF GASTRIC LAVAGE REPORTED TO A STATEWIDE POISON CONTROL SYSTEM

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□ **Abstract—Background: As decontamination trends have evolved, gastric lavage (GL) has become a rare procedure. The current information regarding use, outcomes, and complications of GL could help refine indications for this invasive procedure. Objectives: We sought to determine case type, location, and complications of GL cases reported to a statewide poison control system. Methods: This is a retrospective review of the California Poison Control System (CPCS) records from 2009 to 2012. Specific substances ingested, results and complications of GL, referring hospital ZIP codes, and outcomes were examined. Results: Nine hundred twenty-three patients who underwent GL were included in the final analysis, ranging in age from 9 months to 88 years. There were 381 single and 540 multiple substance ingestions, with pill fragment return in 27%. Five hundred thirty-six GLs were performed with CPCS recommendation, while 387 were performed without. Complications were reported for 20 cases. There were 5 deaths, all after multiple ingestions. Among survivors, 37% were released from the emergency department, 13% were admitted to hospital wards, and 48% were admitted to intensive care units. The most commonly ingested substances were nontricyclic antidepressant psychotropics (n = 313), benzodiazepines (n = 233), acetaminophen (n = 191), nonsteroidal anti-inflammatory drugs (n = 107), diphenhydramine (n = 70), tricyclic antidepressants (n = 45), aspirin (n = 45), lithium (n = 36), and antifreeze**

(n = 10). The geographic distribution was clustered near regions of high population density, with a few exceptions. Conclusions: Toxic agents for which GL was performed reflected a broad spectrum of potential hazards, some of which are not life-threatening or have effective treatments. Continuing emergency physician and poison center staff education is required to assist in patient selection. © 2016 Elsevier Inc. All rights reserved.

INTRODUCTION

Gastric lavage (GL)—the use of an orogastric tube passed into the stomach for the removal of ingested toxic substances—was considered a routine intervention in patients with toxic ingestions who presented to an emergency department (ED) [1]. In the last couple of decades, however, the development and use of different modalities for decontamination, combined with evidence of harm or lack of efficacy with GL, have prompted a decrease in its use [2]. In 2004 and 2013, the American Academy of Clinical Toxicology (AACT) and the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT) released consensus statements to limit the use of GL to early presentations (i.e., ≤60 min) after the ingestion of

potentially life-threatening amounts of a toxic substance (Figure 1) (3,4). The position papers emphasized the concept that GL should not be performed routinely, if at all, in poisoned patients (4).

Current trends in the use of GL are not well-reported. The involvement of U.S. poison control centers (PCCs) in recommendation of GL has not been evaluated for approximately 10 years, nor have the rates of complications from this procedure as captured by PCC data. Simultaneously, emergency physicians and toxicologists in training are having fewer hands-on experiences with this technique (5). We hypothesized that understanding and evaluating situations where GL was performed could help suggest areas for improvement with regard to compliance with evidence-based poison control policies and education of clinical providers. The objective of this study was to evaluate the use of GL, as reported to a statewide poison control system, over the most recent 4-year period.

METHODS

This retrospective study was approved by the Community Medical Centers Institutional Review Board and the Research Committee of the California Poison Control System (CPCS). Data from all calls between January 1, 2009 and December 31, 2012 were obtained from the CPCS electronic database (Visual Dotlab, Fresno, CA). This electronic record is completed in real-time by Specialists in Poisoning Information (SPI) at one of four CPCS sites (i.e., San Francisco, Sacramento, Fresno/Madera, or San Diego), using a combination of coding and free text entries. The American Association of Poison Control Centers generic code for GL ("LAVA") and free text searching for terms related to GL were used to identify all cases where GL was performed.
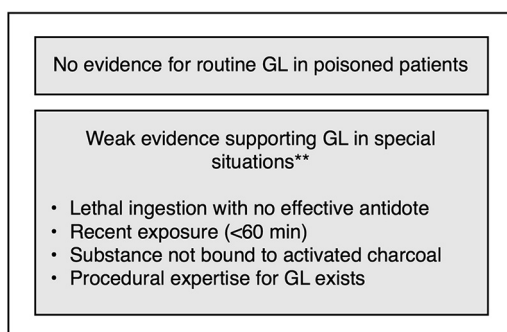
Figure 1. Indications for gastric lavage (GL). Evidence to support routine gastric lavage use is weak (level of evidence IV) and it is no longer routinely recommended in the care of poisoned patients. AAPCC = American Association of Poison Control Centers; EAPCCT = European Association of Poisons Centres and Clinical Toxicologists.

Data abstracted by a single author (J.D.) from each individual case included the following: age, sex, ZIP code of reporting health care facility, date and time of exposure, substance ingested, intentional or unintentional ingestion, coingestants, clinical effects, need for intubation, patient disposition, CPCS recommendations, decontamination method used, outcome of GL (i.e., pill fragments retrieved or no fragment retrieved) for nonliquid ingestions, and complications reported during or after GL. Cases were excluded if there was unclear documentation of whether or not GL was performed, if further history confirmed that the patient had not ingested any substance, or in cases where GL was considered but not performed. All relevant demographic and clinical information on deidentified patients was entered into Excel (Microsoft, Redmond, WA) and descriptive statistics were calculated. Geographic information systems mapping was performed using Mapsdata (available at mapsdata.co.uk). Treating facility ZIP codes were used to create a heat map to show areas of higher density using a black and white color gradient.

RESULTS

During the study period, CPCS was consulted on 943 cases where GL was documented to have been performed either with or without PCC recommendation. Twenty cases were excluded because of unclear documentation, or where follow-up proved to be noningestion even though GL was initially performed. This left 923 cases in the final analysis. Ages ranged from 8 months to 88 years (n = 912; median 30 years [standard deviation 15.7 years]; patient age was not recorded in 11 cases). There were 351 male patients (38%), 571 female patients (62%), and 1 transgender patient (0.1%). Additional patient and exposure characteristics are shown in Table 1.

The most common xenobiotics ingested, either alone or in combination with other substances, are shown in Table 2. Nontricyclic antidepressant psychotropic agents, such as quetiapine, trazodone, sertraline, and olanzapine, were most common. This was followed by the ingestion

Table 1. Patient and Exposure Characteristics

Characteristic	Cases
Mean age, y (range)	26.1 (0.75–88)
Female sex, n (%)	571 (62)
Single ingestion, n (%)	381 (41)
>1 type of substance ingested, n (%)	540 (59)
Intentional overdose, n (%)	884 (96)
Unintentional overdose, n (%)	36 (4)
Intubated, n (%)	225 (24)
Not intubated, n (%)	696 (75)