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Gastric lavage in poisoning: not to be neglected

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ABSTRACT

Poisoning is a common cause of admission and mortality, especially of the young people in hospitals in Nepal. Limiting ongoing absorption of toxic compounds is one of the core principles of care for poisoned patients, and gastrointestinal decontamination is the most important aspect. Common gastric decontamination techniques and their indications, problems, contraindications and selective roles in the management of poisoning are reviewed in the article. Each of the gastrointestinal decontamination techniques has its own role, problems and contraindications. The use of each of them is selective.

Gastric lavage, in particular, is indicated after any potentially life-threatening poisoning. The benefit from gastric lavage in such circumstances with overdose with any potentially lethal ingestion is quite significant. This becomes more important in view of young age of the patients involved. Further, in our set-up, poisons consumed are commonly toxic and antidotes and intensive care of poisoning may not be available. That is why the mortality rate from poisoning is high as compared with that in the developed countries. Thus, the gastric lavage appears to be more important in our set up than in the developed countries. The Management and the Departments of Medicine and Emergency of Hospitals and Poison Centres should ensure that the use of gastric lavage is not neglected in indicated cases. It would be quite effective to include the procedure of gastric lavage in the log book of postgraduate students of Internal Medicine and General Practice.

Keywords: Poisoning; gastric lavage; activated charcoal.

INTRODUCTION

Poisoning is a common cause of admissions in hospitals in Nepal. In Bir

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Hospital, it is one of the first ten causes of admission, and in the younger age group, it is the commonest cause of medical admissions.[1,2,3] The percentage of admitted poisoning cases has been found to be on the increase from the year 1986-1987 to 1991-1992 in TU Teaching Hospital.[4] The management of poisoning needs to be given importance. The main reasons for giving importance to poisoning are:

- it is a common problem,
- it most commonly involves young people and
- it is potentially curable.

The term 'attempted suicide' is potentially misleading in that the majority of patients are not unequivocally trying to kill themselves.[5] Other terms such as 'deliberate self-harm' should be preferred. Less than 20% make a repeat attempt later and 1% succeed in killing themselves.[5] Thus, the management of this common problem of young people gives gratifying results, as compared with many other types of cases seen in Internal Medicine.

GASTROINTESTINAL DECONTAMINATION TECHNIQUES

Limiting ongoing absorption of toxic compounds is one of the core principles of care of poisoned patients and gastrointestinal decontamination is the most important aspect.[6] If the patients have survived when they present to medical facility, limiting further absorption would definitely help in their management. The commonly used gastrointestinal decontamination techniques are:

- emesis,
- gastric lavage,
- activated charcoal (single and multi-dose), and
- cathartics.

Other uncommon possible gastrointestinal decontamination methods[6] are:

- whole-bowel irrigation,
- use of other binding agents like cholestyramine,
- endoscopic removal and
- surgery for drug containing packets.

The common gastrointestinal decontamination techniques

Emesis

Emesis induced by ipecacuanha has been used in adults and children, but is of very limited value.[7] There is no evidence that it prevents clinically significant absorption, even if used within 1 to 2 hours, and its adverse effects may often complicate diagnosis.[7] In fact, nowadays it is even considered that syrup of ipecacuanha has virtually no longer a role in the management of poisoning.[8] Contraindications to emesis by ipecac include decreased level of consciousness, absent gag reflex, caustic ingestion, ingestion of poorly absorbed hydrocarbons (eg, gasoline, kerosene, mineral seal oil) convulsions or exposure to a substance likely to cause convulsions, co-ingestion of sharp solid objects, medical conditions that make emesis unsafe, and children less than 6 months of

age. Ipecac should not be given for ingestion of unknown toxins, as aspiration may occur if coma or seizures develop.[9] Settings where emesis continues to have important role include refusal or contraindication of gastric lavage, ingestion of objects too large to pass through a lavage tube and ingestion by small children in whom large-bore tubes cannot be used safely.[6,7] Except for aspiration, serious complications are rare. Isolated cases of gastric and oesophageal tears and perforations and stroke have been reported.[10]

Gastric lavage

When gastric emptying is indicated, orogastric lavage is preferable to syrup of ipecac-induced emesis in nearly all hospital cases.[6] Gastric lavage is more effective and immediately active in removing the ingested poison. Gastric emptying by lavage (or emesis) is clearly unnecessary if the risk of toxicity is small or if the patient presents too late.[7] Emptying the stomach by gastric lavage is most useful if attempted within 1 to 2 hours after ingestion of a potentially life-threatening amount of poison.[7,11] Certain factors, eg, severely intoxicated patients, involvement of drugs that delay absorption and gastric emptying (eg, tricyclic antidepressant), ingestion of substances which require metabolic activation before becoming toxic (eg, paracetamol, methanol, ethylene glycol, and some organophosphate insectisides), ingestion of large quantities of toxic drugs, absence of bowel sounds on physical examination indicate the possible usefulness of gastric lavage even as long as 4 to 6 hours of ingestion.[7,12,13] With drugs that slow gastrointestinal motility or cause pylorospasm, eg, anticholinergics, opioids, salicylates, lavage can be done up to 24 hours.[6,14] If the patient is unconscious, the time since ingestion maybe less relevant since it is obvious that a toxic dose has been ingested and the gastrointestinal stasis which often accompanies deep coma can delay gastric emptying.[13] It is therefore recommended that gastric lavage be carried out in every unconscious poisoned patient if the airway can be protected.[15]

The chief danger of gastric lavage is inhalation of stomach contents, and it should not be attempted in drowsy or comatosed patients unless there is a good enough cough reflex or the airway can be protected by a cuffed endotracheal tube.[7] The other complications are laryngospasm, mechanical injury to the throat, oesophagus, and stomach, fluid and electrolyte imbalance.[11] Combative patients maybe at greater risk of complications.[11] If a patient has ingested corrosive substance or petroleum distillates, gastric lavage is contraindicated for fear of fulminant pneumonitis and rupture of oesophagus.[14] Gastric lavage is also contraindicated in patients who are at risk of haemorrhage or gastrointestinal perforation due to pathology, recent surgery, or other medical condition, that could be further compromised by the use of gastric lavage.[11] It should also be avoided if there is coingestion of sharp objects.[12]

Activated charcoal

Activated charcoal has an important role in the management of toxicological

emergencies, but the description of that role is still being defined.[6,7] It is most effective when given within 1 hour of poisoning.[12] It may still be effective up to 2 hours after ingestion – and longer in the case of modified-release preparations or drugs with anticholinergic properties.[7] It is particularly useful for the prevention of absorption of poisons which are toxic in small amounts, eg, antidepressants.[7] Activated charcoal is usually given as a single-dose therapy. Multiple-dose activated charcoal enhance the elimination of some drugs after they have been absorbed. Repeated doses of activated charcoal aid of some drugs from the circulation by interrupting their enterohepatic circulation and adsorbing that which diffuses into the intestinal juices. Repeated doses of activated charcoal are given after overdose with aspirin, carbamazepine, dapsone, phenobarbitone, quinine, and theophylline.[7]

Activated charcoal does not bind well to elemental metals (lead, lithium, boron), boric acid, some pesticides (malathion, DDT, N-methyl carbamate), ferrous sulfate, cyanide, strong acids and alkali, ethanol, and petroleum distillates.[12] Activated charcoal does bind emetine, and therefore the concomitant use of ipecac syrup and activated charcoal is usually not recommended.[12] Corrosive ingestions contraindicate the use of activated charcoal because of the lack of efficacy and obscuration of endoscopy.[12] With adequate airway protection, there is usually no serious risk associated with activated charcoal.
Minor adverse effects of activated charcoal, including nausea, vomiting and constipation or diarrhoea, depending on preparations, are common. Its colour, gritty texture, taste and amount make it unacceptable to many; thus, in practice compliance is a problem. Other reported adverse effects include bowel obstruction or pseudo-obstruction, and atelectasis due to mechanical obstruction.[6,12] But aspiration is the biggest potential problem with activated charcoal, which was previously thought to be inert.[16] Several cases of aspiration including fatalities have been described.[6]

Cathartics

Cathartics are also routinely used in the treatment of the poisoned patients, even though their efficacy remains unproved.[6] However alone, cathartics do not prevent poison absorption; their primary use is to prevent constipation following charcoal administration.[10] Cathartics increase gastrointestinal transit speed and thus theoretically decrease the transit time during which drug absorption may occur. Other complex mechanisms are also suggested.[12] Many cathartics are available, although only magnesium citrate, magnesium sulfate, sodium sulfate, disodium phosphate, mannitol and sorbitol are generally considered for use, and sorbital is predominant in the United States.[6,12] The most effective cathartic is sorbitol in a dose of 1 to 2 g/kg of body weight. Single doses of cathartics are generally safe and appropriate despite a lack of convincing evidence of efficacy.[6,9] The use of cathartics should be avoided in corrosive ingestion, severe diarrhoea, adynamic ileus, electrolyte problems, and recent bowel

surgery. Magnesium containing cathartics should not be used in patients with renal failure.

USE OF GASTROINTESTINAL DECONTAMINATION TECHNIQUES

The value of gastric decontamination techniques depend on the toxicity and amount of poison, condition of the patient and time after consumption. Each of the gastrointestinal decontamination techniques has its own role, problems and contraindications. None of them can be employed routinely in the management of all poisoned patients. The use of gastrointestinal decontamination techniques should be selective. In general, in indicated cases induced emesis is usually used in children and gastric lavage in adults; oral activated charcoal is also used alone or as an adjunct to gastric lavage.[8] The challenge for clinicians managing poisoned patients is to promptly identify those who are most at risk of developing serious complications and who might potentially benefit, therefore, from gastrointestinal decontamination.[11]

There is an evidence of benefit of gastric emptying in patients with high risk ingestions. Power analysis of recent studies indicated twofold benefit from gastric emptying in severely intoxicated group.[6] Very few medical interventions provide a twofold benefit, and lesser degrees of benefit maybe important, particularly in patients very close to life-threatening thresholds of toxicity.[6] It is neither scientifically nor logically sound to withhold gastric emptying from patients with overdoses with any potentially lethal ingestions.[6] The safest course, therefore, is to perform gastric emptying on patients with unknown, potentially lethal ingestion or known very high risk ingestion, sometimes even if the patient is asymptomatic beyond the time that onset of toxicity would be expected by history.[6] Gastric lavage is appropriate and the only practicable method of gastric emptying in unconscious patients.[13,15]

IMPORTANCE OF GASTRIC LAVAGE IN DEVELOPING COUNTRIES

The mortality rate from poisoning is also determined by the lethality of the agents involved, which in turn results in regional differences in mortality rates which are often much higher in developing countries. In the USA, exposures most frequently involve cleaning agents, analgesics, cosmetics, plants, cough and cold preparations, and hydrocarbons.[10] Most exposures result in minor or no toxicity.[10] Pharmaceuticals are involved in 41% of exposures. In the UK, drugs at the present time involved in poisoning in adults include benzodiazepines, serotonin-specific re-uptake inhibitors, tricyclic antidepressants, anticonvulsants and analgesics, including non-steroidal anti-inflammatory drugs, salicylates, opioid, paracetamol, etc.[8] In the USA, the overall mortality from acute poisoning is less than 1%.[11] In England and Wales, the inpatient mortality is less than 1% of all cases admitted to hospital.[8]

In our community, the poisons consumed are commonly toxic like organophosphorous compounds, aluminium phosphide, etc[1,17-20]

and thus, mortality rate is relatively higher. Last year, the mortality rate of all poisoned patients was 6.5%, by organophosphorous it was 7.4%, and by aluminium phosphide it was 33.3% in Bir Hospital, a central hospital of Nepal.[1] In such poisoning with toxic substances, prevention of absorption of even small amount may make a significant difference. Antidotes like PAM are expensive and are not freely available in our country. Even activated charcoal is not freely available. Close monitoring and intensive care of poisoned cases may not be possible all over the country. Thus, any intervention which is easily possible in our set up, like gastric lavage, can not be neglected in indicated cases. The fact that the majority of such poisoned patients are young people[1,21] further highlights its importance. Considering all these facts, gastric lavage may need to be more frequently used in developing countries like ours than in the developed ones. Experts from India, where poisons ingested are similar to ours, recommend that in all types of poisoning, gastric lavage is useful within the first four hours of ingestion of poison, except in tricyclic antidepressants, salicylate and morphine poisoning and in an unconscious patients where lavage can even be done several hours later[14,22], Gastric lavage is one of the very pillars of management of poisoning by ingestion. It has its limitations, but it should no doubt be used in indicated cases.

RECOMMENDATIONS

1. The use of gastric lavage in indicated cases is a very important part of management in reducing mortality of young people with poisoning, which is usually with toxic substances in our set up. The Medicine and Emergency Departments of central hospitals of Nepal, like TUTH, Bir and Patan Hospitals, should ensure that it is not neglected in indicated cases. This would also help in training the doctors in its use and indissemination of knowledge all over the country.
2. It would be quite effective to include the procedure of gastric lavage in the log book of postgraduate students of Internal Medicine and General Practice.
3. Poison and drug information centres and units of the country should promote the use of gastrointestinal decontamination techniques in hospitals in indicated cases.
4. Many a time poisoned patients are transferred to better centres; before transfer, gastric emptying in indicated cases should preferably be done at the local institutions if indicated.

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