

**A REVIEW ON GASTRIC LAVAGE IN THE MANAGEMENT OF INGESTED POISONING**\*<sup>1</sup>Dr. Jagdish Kumar Anant, <sup>2</sup>Dr. S.R.Inchulkar <sup>3</sup>Dr. Prafulla <sup>4</sup>Dr. Sangeeta Bhagat<sup>1</sup>P G Scholar, <sup>2</sup>Professor & HOD, <sup>3</sup>Associate Professor, <sup>4</sup>Assistant Professor, P.G. Department of Agad Tantra Evam Vidhi Vaidyak, Govt. Ayurvedic College, Raipur, Chhattisgarh India.**\*Corresponding Author: Dr. Jagdish Kumar Anant**

P G Scholar, P.G. Department of Agad Tantra Evam Vidhi Vaidyak, Govt. Ayurvedic College, Raipur, Chhattisgarh India.

Article Received on 14/08/2018

Article Revised on 04/09/2018

Article Accepted on 25/09/2018

**ABSTRACT**

Acute poisoning is a common medical emergency in any country. The majority of patients who present after ingested poisoning need further measures such as gastric decontamination and methods to increase elimination. Mostly attending physician recommends gastric lavage. Gastric lavage is recommended mainly for patients who have ingested a life-threatening dose of poison. Method of emptying of stomach to remove out the unabsorbed poison along with gastric content by suction is called as a gastric lavage. Gastric lavage is most useful in ingested poisoning within 1-2 hour after ingestion of any poison (can be done till 4-6 h after ingestion). It should be carried out with great care and precaution to avoid complications. This process should be carried out in time, in proper patient and following the precautions for the beneficial effect of the process. Duties of a Doctor in a case of suspected poisoning (1) **Medical:** care and treatment to save the life of the patient is the first and foremost duty. (2) **Legal:** assist the police to determine the manner of poisoning. This review explores the role of gastric lavage in management of ingested poisoning, its complication along with its medicolegal aspect.

**KEYWORDS:** Gastric Lavage, Ingested Poisoning, Ewalds or Boas Tube, Complication, Medicolegal Aspect etc.**INTRODUCTION**

Poisoning of accidental and intentional both are a significant contributor to mortality and morbidity throughout the world. According to WHO, 3 million acute poisoning cases with 2,20,000 deaths occur annually. The exact incidence of poisoning in India is uncertain due to lack of data at central level as most of the cases are not reported, and as mortality data are a poor indicator of incidence of poisoning. It has been estimated that about 5 to 6 persons per lakh of population die due to poisoning every year. The commonest cause of poisoning in India and other developing countries is pesticides, the reasons being agriculture based economics, poverty, illiteracy, ignorance, unsafe practices, and easy availability of highly toxic pesticides. In India, organophosphates form the largest bulk of pesticide poisoning.<sup>[1]</sup> 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).<sup>[2]</sup> If the poison is swallowed, it should be removed by gastric lavage, which is most effective if done within 2-4 hours of ingestion. Role of gastric lavage in management of ingested poisoning is essential. Gastric lavage is a chief component of basic principle of poisoning management for removal of unabsorbed poison.<sup>[3]</sup>

**AIM AND OBJECTIVES**

1. To explore the role of gastric lavage in management of ingested poisoning.
2. To make the society aware of benefits of gastric lavage, if attended as early as possible.
3. To give maximum information regarding the procedure that is beneficial for attending physician.

**MATERIAL AND METHODS**

This critical review is mainly based on contemporary texts and published information from several articles. The papers reviewed in this article are selected from the medicinal journals. This review is carried out with respect to following steps.

**GASTRIC LAVAGE (BOA'S OR EWALD'S) TUBE<sup>[4]</sup>**

It is 1-1.5 meter long, 12.7 mm broad, rubber tube, thick enough to pass without kinking and has the following parts:

1. **Funnel end (mouth end):** to pour in fluid and to take out fluid after lavage.
2. **Suction bulb (sometimes absent):** a) to force open the perforations if blocked by food material. b) To take out fluid if siphon action fails.
3. **Lower rounded perforated end (stomach end):** is rounded to avoid damage to the GIT during its passage.

4. **Rubber tubing:** is marked at 40 cm, 50 cm and 60 cm.
5. **Mouth gag:** is a wooden structure (wooden to avoid damage to the teeth) and has a central large hole for the passage of rubber tube, one end pointed to help force open the clenched teeth, 2 sides holes to enable tie a thread to the head of the patient, in case the patient is violent. (Ideal tube for gastric lavage is **levacuator**- clear plastic tube- double lumen tube).
6. **Size:** comes in different sizes, which are measured by F scale. F= French scale, each unit= 0.3 mm.

#### RYLE'S TUBE (NASOGASTRIC TUBE)<sup>[5]</sup>

Ryle's tube of appropriate size may be used for gastric lavage. In **adults**, it is inserted through the nose, upto the second marking wherein the tip reaches the midway of body of stomach (1<sup>st</sup> marking: at the level of cardiac end of stomach, 3<sup>rd</sup> marking: pyloric end). In **children** gastric lavage is done using Ryle's tube or Rubber Catheter

using, 20 or 50 ml syringe to push in or take out the fluid. 30 cm length is necessary to reach stomach.

- It is manufactured from non toxic, non irritant PVC.
- Specially designed for nasogastric introduction for nutrition and aspiration of intestinal secretion.
- Four lateral eyes are provided for efficient aspiration and administration.
- The tube is marked at 50 cm 60 cm and 70 cm from the tip for accurate placement.
- Super smooth low friction surface facilitates easy intubation, length: 105 cm.
- Provide with X-ray opaque throughout the length.
- Sizes: 8, 10, 12, 14, 16, 18, 20.

#### GASTRIC LAVAGE KITS<sup>[6]</sup>

Nowadays single use disposable gastric lavage kits are available. These kits are available with activated charcoal suspension, sorbitol, solution bag and drain bag. These kits are preassembled and easy to use.



#### DIFFERENCE BETWEEN GASTRIC LAVAGE TUBE AND RYLE'S TUBE<sup>[7]</sup>

Features	Gastric Lavage Tube	Ryle's Tube
Position of patient	Trendelenburg with head low	Supine with neck extend
Route of insertion	Oro-gastric (Mouth)	Naso-gastric (Nasal)
Tube called as	Oro-gastric tube (OGT)	Naso-gastric tube (NGT)
Indication	Rarely used thick/viscous poison	Commonly used all poison
Example	Opium	All poison

#### INDICATIONS<sup>[8, 9, 10]</sup>

- Conscious patient.
- Ingestion of poison within 1-2 hours. Even if the poison has been ingested more than 6 hours earlier, gastric lavage may be useful since in case of depression and unconsciousness the gastric emptying time is increased.
- Some authorities still recommend lavage up to 6 to 12 hours post-ingestion in the case of salicylates, tricyclics, carbamazepine, and barbiturates.
- Morphine injected – is excreted in the stomach.

#### CONTRAINDICATIONS<sup>[11, 12, 13, 14]</sup>

##### [A] Absolute

- **Corrosives-** because of risk of perforation, except-carbolic acid, oxalic acid and acetic acid etc.
- **Nontoxic-ingestions.**
- **Sharp and pointed material ingestion-** pins, needles and glass etc.

##### [B] Relatives

- **Cardiac arrhythmias.**
- **Children-** can be done with Ryle's tube.
- **Coma-** may cause aspiration.
- **Convulsions-** need to be controlled first.
- **Esophageal varices-** look for accidental rupture.
- **Hemorrhagic diathesis-** may cause bleeding.
- **Hypothermia-** body temperature would need careful attention.
- **Kerosene poisoning-** can be done with a cuffed endotracheal tube.
- **Late arrival of patient-** can be done in case of anticholinergics, morphine, salicylates, tricyclics, carbamazepine, and barbiturates.
- **Poison-** having an effective antidote.
- **Pregnancy-** advanced.
- **Surgery-** recent.
- **Volatile poisons-** can be done with a cuffed endotracheal tube.

- **Vomiting-** (severe) poison already expelled.

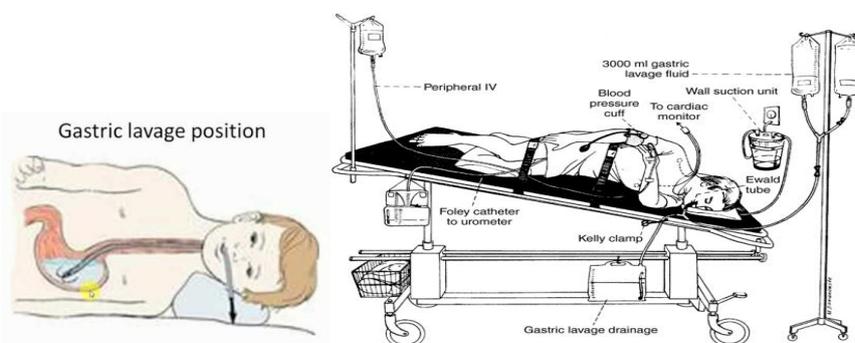
#### PRECAUTIONS<sup>[15, 16, 17]</sup>

- Obtain consent and explain procedure.
- Never embark on procedure as routine.
- Do not perform in nontoxic agent ingestion.
- The patient should be semi-prone or prone to the left side.
- Head should be lower than hips (to help better drainage).
- Ensure clear airway.
- Dentures, if any should be removed.
- Mouth gag should be always used (helps to avoid biting of the tube).
- Ensure that the tube is in the stomach only.
- The first washing should be with plain water and using only 100-200 ml of water (because this sample is to be sent for chemical analysis).
- Continue stomach wash till the color of going in and coming out fluid is same.
- Pinch the tube before removing (to avoid aspiration).
- In absence of a gastric lavage tube, any rubber tube and a glass funnel can be used.

#### PROCEDURE (GASTRIC LAVAGE THROUGH EWALD'S TUBE ORALLY)<sup>[18, 19, 20]</sup>

##### 1. Position of the patient

The patient should be on his left side or prone, with head hanging over the edge of the bed, and face down. Patient is kept in **Trendelenburg position** the feet are higher than the head by 15-30°.



##### 2. Introduction of the tube

- Protect airway.
- Place patient on lateral position.
- Tube should be passed orally.
- Lubricate the inserting end of tube.
- Use mouth gag.

##### 3. Confirmation of the tube in stomach

Air is blown from funnel end and it is auscultated at the area of stomach. In case it enters respiratory passages:

- Cough reflex starts.
- Hissing sounds heard at funnel end.
- Air bubbles seen on dipping the funnel end in water.

##### 4. Lavaging the stomach

- Preserve first sample for chemical analysis.
- Pass about 250 cc of plain warm water through the funnel, held high above the head.
- When funnel is empty, pinch tube just below the funnel between finger and thumb.
- Lower it below the level of stomach.
- Release finger and thumb to relieve blockade.
- Contents will be emptied by siphon action.

##### 5. Indication to stop lavage

Stop when the returning fluid is clear, odorless, and is of the same nature as the fluid introduced. In case of  $\text{KMnO}_4$  initially colorless, lavage should be stopped when the returning fluid has pink color.

#### SOLUTIONS FOR GASTRIC LAVAGE<sup>[21, 22]</sup>

S.N.	Solution used	Poison
01	Calcium gluconate, lactate and other calcium salts	Oxalates
02	Castor oil with warm water	Carbolic acid (phenol)
03	Copper sulphate (recommended earlier)	Phosphorus
04	Desferrioxamine (2 gm in 1 litre of water)	Iron
05	$\text{H}_2\text{O}_2$	CN
06	Potassium iodide (1 %)	General
07	Potassium permanganate ( $\text{KMnO}_4$ 1: 5000)	Oxidizable poisons (alkaloids, phosphorus, salicylates)
08	Saline	Any unknown poison
09	Saturated lime water	General
10	Sodium bicarbonate (5 %)	General
11	Sodium iodide (1 %)	General
12	Sodium thiosulfate (25 %)	CN
13	Starch solution	Iodine

14 | Tannic acid (4 %)

General

**COMPLICATIONS**<sup>[23, 24, 25]</sup>

- Aspiration pneumonia.
- Mallory-Weiss syndrome.
- Laryngospasm.
- Hypothermia.
- Vagal inhibition.
- Cardiac arrhythmias.
- Electrolyte imbalance.
- Perforation of oesophagus or stomach.

**DISADVANTAGES**<sup>[26]</sup>

- May delay administration of activated charcoal, which is more useful procedure.
- May push tablets further into the GI tract. In general, gastric lavage is better than emesis because of more discomfort caused to the patient in vomiting.

**MEDICOLEGAL DUTIES OF A DOCTOR IN POISONING CASES**<sup>[27]</sup>

There are **Ten Commandments** to be followed by all doctors in cases of suspected or actual poisoning:

1. If a case of poisoning is accidental or suicidal in nature, the attending physician is under no legal obligation to notify the police in case he is working in a private hospital. But if the patient dies, the police has to be informed. Death certificate must not be issued.
2. Doctors working in government hospitals are required to report every case of poisoning regardless of the nature, to the police.
3. All cases of homicidal poisoning (definite or suspected) must be compulsorily reported to the police as per **Section 39** of the **CrPC**. Failure to do so will make him culpable under **Section 176** of the **IPC**.
4. If the police require information on any case of poisoning which is either suicidal or homicidal in nature, the attending physician has to divulge it. There is no scope for professional secrecy in such matters (**175 CrPC**). If information is withheld or wrong information is provided, the doctor becomes culpable under **Section 202** and **193 IPC** respectively.
5. Every effort must be made by the attending physician to collect and preserve evidence suggestive of poisoning. Deliberate omission to do so can attract punishment under **Section 201 IPC**.
6. Collect vomitus, faeces, stomach washings, contaminated food, etc., and dispatch the same for chemical analysis to the nearest forensic science laboratory.
7. If a poisoned patient is conscious but on the verge of death, record a dying declaration relating to the circumstances. It is preferable to call a magistrate for this purpose, but if death appears imminent, or if there is likelihood of delay in the arrival of the magistrate, the attending physician must himself record the declaration as per **Section 32, clause 1**, of

the **IEA**. Even when a declaration is taken down by a magistrate, the presence of a doctor is desirable to certify that the dying victim was in possession of his senses, there was no clouding of judgement or coherence which is sometimes encountered in the final moments before death.

8. If a patient dies before the exact diagnosis could be made out, or he was brought dead to the hospital, the duty doctor must notify the police who will in all probability order an autopsy to be done. Death certificate must not be issued.
9. Detailed written record should be made with respect to every case of poisoning and kept in safe custody.
10. If a doctor comes across a case of food poisoning from a public eatery (canteen, café, restaurant, etc.), he must notify the public health authority concerned.

**CONCLUSION**

The procedure of removal of unabsorbed poison have major role to manage the patient of poison because if we success to remove maximum poison, then further worsening will be avoided. It is carried out only in case of ingested poison especially when ingested in fatal dose. It is clear that the gastric lavage is carried out to remove the maximum poison from the body prior to its digestion and its absorption. Sometime only gastric lavage may be life-saving, if undertaken as early as possible after ingestion of poison. This procedure is not only used to remove the unabsorbed poison but also during resuscitation in new born.

**REFERENCES**

1. K. S. Narayan Reddy, The Essentials of Forensic Medicine and Toxicology 34<sup>th</sup> edition-2017, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-466.
2. Sassan Naderi, The Use of Gastric Lavage in India for Poisoned Patients, Journal of Clinical Toxicology, Volume 2, Issue 2, 2012, p-1-4.
3. Jaising P Modi, Modi A Textbook of Medical Jurisprudence and Toxicology 26<sup>th</sup> edition-2018, Lexis Nexis publication Gurgaon-12202, Haryana, section-2, p-24.
4. S. K. Singhal, Singhal's Toxicology at a Glance 9<sup>th</sup> reprint edition-2017, The National Book Depot Mumbai-400012, p-19.
5. Gautam Biswas, Review of Forensic Medicine and Toxicology 4<sup>th</sup> edition-2019, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-474.
6. Rajesh Bardale, Principles of Forensic Medicine & Toxicology 2<sup>nd</sup> edition-2017, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-484.
7. Sharad Porte, Agadtantra Vish Chikitsa Vigyan 1<sup>st</sup> edition-2016, Ayurved Sanskrit Hindi Pustak Bhandar Jaipur-302001, p-60.

8. V V Pillay, Textbook of Forensic Medicine & Toxicology 18<sup>th</sup> edition-2017, Paras Medical Publisher Hyderabad-500095, p-513.
9. Rajesh Bardale, Principles of Forensic Medicine & Toxicology 2<sup>nd</sup> edition-2017, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-484.
10. S. K. Singhal, Singhal's Toxicology at a Glance 9<sup>th</sup> reprint edition-2017, The National Book Depot Mumbai-400012, p-18.
11. Anil Aggrawal Forensic Medicine and Toxicology for MBBS 1<sup>st</sup> edition-2016, Avichal Publishing Company Sirmour-173030, (HP), p-464-465.
12. Dr. Jyoti Mane, Role of Gastric Lavage in Management of Ingested Poisoning-A Review, International Journal of Science and Research (IJSR), Volume 6 Issue 1, January 2017, p-2120-2121.
13. V V Pillay, Textbook of Forensic Medicine & Toxicology 18<sup>th</sup> edition-2017, Paras Medical Publisher Hyderabad-500095, p-514.
14. S. K. Singhal, Singhal's Toxicology at a Glance 9<sup>th</sup> reprint edition-2017, The National Book Depot Mumbai-400012, p-18.
15. Rajesh Bardale, Principles of Forensic Medicine & Toxicology 2<sup>nd</sup> edition-2017, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-484.
16. V V Pillay, Textbook of Forensic Medicine & Toxicology 18<sup>th</sup> edition-2017, Paras Medical Publisher Hyderabad-500095, p-513.
17. S. K. Singhal, Singhal's Toxicology at a Glance 9<sup>th</sup> reprint edition-2017, The National Book Depot Mumbai-400012, p-19.
18. Anil Aggrawal Forensic Medicine and Toxicology for MBBS 1<sup>st</sup> edition-2016, Avichal Publishing Company Sirmour-173030, (HP), p-463-464.
19. Gautam Biswas, Review of Forensic Medicine and Toxicology 4<sup>th</sup> edition-2019, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-473.
20. Rajesh Bardale, Principles of Forensic Medicine & Toxicology 2<sup>nd</sup> edition-2017, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-484.
21. Anil Aggrawal Forensic Medicine and Toxicology for MBBS 1<sup>st</sup> edition-2016, Avichal Publishing Company Sirmour-173030, (HP), p-464.
22. V V Pillay, Textbook of Forensic Medicine & Toxicology 18<sup>th</sup> edition-2017, Paras Medical Publisher Hyderabad-500095, p-514.
23. Anil Aggrawal Forensic Medicine and Toxicology for MBBS 1<sup>st</sup> edition-2016, Avichal Publishing Company Sirmour-173030, (HP), p-465.
24. Gautam Biswas, Review of Forensic Medicine and Toxicology 4<sup>th</sup> edition-2019, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-473.
25. K. S. Narayan Reddy, The Essentials of Forensic Medicine and Toxicology 34<sup>th</sup> edition-2017, Jaypee Brothers Medical Publishers (P) Ltd New Delhi-110002, p-466.
26. Anil Aggrawal Forensic Medicine and Toxicology for MBBS 1<sup>st</sup> edition-2016, Avichal Publishing Company Sirmour-173030, (HP), p-463.
27. V V Pillay, Textbook of Forensic Medicine & Toxicology 18<sup>th</sup> edition-2017, Paras Medical Publisher Hyderabad-500095, p-521-522.