

## A Study on Effect of Gastric Lavage on Outcome of Poisoning in a Tertiary Care Hospital

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### Abstract

**Background:** Acute poisoning has reached the epidemic form which is the main means of deliberate self harm. The gastric lavage at an earliest poison of time is an important additional procedure of decontamination. This study was undertaken mainly to study the effectiveness of early and late gastric lavage in emergency department. **Materials and Methods:** A prospective study was undertaken among the 90 cases admitted to emergency department over a period of three years. The gastric lavage was performed on all the patients and morbidity and mortality of all the patients was studied with respect to duration of ventilation, duration of stay in ICU and mortality. **Results:** Age group of 31–40 years in early gastric lavage and 41–50 years in late group were higher. Males outnumbered females. Almost 69.8% of the patients with early lavage group and 70.2% in the late lavage group had acute poisoning with organophosphorus poison. The mean duration of ventilation in the early lavage group was 1.46 days and late lavage group was 4.53 days which was statistically significant. Mean duration of ICU stay in early lavage group was 6.4 days and in late lavage group was 7.6 days. About 9.3% of the patients in early lavage group and 17% of the late lavage group were died during the course of treatment in the hospital. **Conclusion:** This study had shown the early gastric lavage may help in reducing the morbidity of the patients with acute poisoning but not mortality of the patient.

**Keywords:** Acute poisoning; Deliberate self harm; Gastric lavage; Ventilation; Intensive care unit.

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### Introduction

Deliberate self by using the means of poisoning has reached an epidemic form as the literature available. This problem is higher especially in the developing countries of the world where the toxic poisons are freely available coupled with the sparse medical facilities.<sup>1</sup> The mortality and morbidity varies with the nature of the poison used and quantity consumed. World Health Organization estimates that, the consumption of poison amounts to 250,000 deaths across the world each year.<sup>2</sup>

The cornerstone in the treatment of the acute poisoning includes decontamination with gastric lavage along with supportive care including antidote. Gastric lavage is the normal first aid procedure which is often practised in the emergency departments for self poisoning.<sup>3,4</sup> The guideline suggest the use of gastric lavage within one hour of the poisoning and when the quantity of the poison consumed is substantial.<sup>5</sup> But the guidelines are meant for the drug overdose and may be irrelevant for the organophosphorous poisoning which is much prevalent in Asian countries.



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Gastric lavage is a practical approach for the decontamination of the poisonous substance consumed. But the quality evidence regarding the benefit of gastric lavage is lacking.<sup>6</sup> The absorption of the poison in the stomach depends on the chemical nature and is affected by substances present in stomach. The absorption of this poison can be further prevented by gastric lavage at earliest point of time.<sup>7</sup>

The evidence regarding the effect of early and late gastric lavage on the outcome of poisoning is not known. Hence this study was undertaken with the aim of studying the outcome of the patients with acute poisoning with early and late gastric lavage.

## Materials and Methods

A prospective study was undertaken in the department of emergency medicine, Basaveshwara Medical College and Hospital, Chitradurga between January 2017 to December, 2019 for a period of three years. A total of 90 patients with acute poisoning attending emergency department constituted the study sample. All the patients with history of consumption of organophosphorus poison, Aluminium phosphide, drugs like opioids and sedatives were included in to the study. The cases under 18 years and acid and alkali ingestion and other types of poison were excluded from the study. Clearance from institutional ethics committee was obtained before the study was started. Informed consent was obtained from the guardian of the patients was obtained before they were included in to the study. All the cases admitted to emergency department were initially stabilized and transferred to Intensive care Unit. The gastric lavage was given to all the patients after stabilizing the vital signs. The patients were first placed in left lateral position and a naso gastric tube was placed through the nostril. The tube in the stomach was ensured by aspirating the gastric content and auscultation over the stomach. The gastric contents were aspirated out first and 300 ml of water at room temperature was pushed. The water was then aspirated completely and the procedure was repeated again till the aspirated water was without any smell and clear. Early gastric lavage was considered when the gastric lavage was done within 1 hours after consumption of the poison. All the patients were followed till discharge/death. A pre designed, self administered proforma was administered in order to collect the data. The data thus collected was entered in an excel sheet and analyzed using

Statistical Package for Social Services (vs 20). A *chi-square* test was used to test the association of categorical variables and independent sample T test was used for quantitative variables.

## Results

**Table 1:** Distribution of the study groups according to age group.

Age group	Early lavage N (%)	Late lavage N (%)
18 - 20 years	1 (2.3)	0
21 - 30 years	0	7 (14.9)
31 - 40 years	21 (48.8)	7 (14.9)
41 - 50 years	10 (23.3)	27 (57.4)
51 - 60 years	11 (25.6)	66 (12.8)
Total	43 (100)	47 (100)

$\chi^2$  value=24.151 df=4 p value, Sig=0.000, Sig

About 48.8% of the patients in early gastric lavage group were aged between 31–40 years and 57.4% were aged between 41–50 years. This difference in age was statistically significant between early and late gastric lavage groups.

**Table 2:** Distribution of the study groups according to gender.

Gender	Early lavage N (%)	Late lavage N (%)
Male	28 (65.1)	20 (42.6)
Female	15 (34.9)	27 (57.4)
Total	43 (100)	47 (100)

$\chi^2$  value=4.593 df=1 p value, Sig=0.032, Sig

About 65.1% of the early lavage group patients were males and 57.4% of the late lavage group were females. This difference was statistically significant.

**Table 3:** Distribution of the study groups according to type of poison.

Type of poison	Early lavage N (%)	Late lavage N (%)
Aluminium phosphide	3 (7.0)	4 (8.5)
Opioids	1 (2.3)	2 (4.3)
Organophosphorous	30 (69.8)	33 (70.2)
Sedatives	9 (20.9)	8 (17.0)
Total	43 (100)	47 (100)

$\chi^2$  value=0.501 df=1 p value, Sig=0.919, Sig

Almost 69.8% of the patients with early lavage group and 70.2% in the late lavage group had acute poisoning with organophosphorus poison. This difference in nature of the poison was not statistically significant between the early and late lavage groups.

**Table 4:** Distribution of the study groups according to duration of mechanical ventilation.

Duration of Mechanical Ventilation	Early lavage	Late lavage	T value	P value
Mean $\pm$ SD	1.46 $\pm$ 2.1	4.5 $\pm$ 3.0	5.564	0.000, Sig

The mean duration of ventilation in the early lavage group was 1.46 days and late lavage group was 4.53 days. This difference was statistically significant between the early and late lavage groups.

**Table 5:** Distribution of the study groups according to duration of stay in ICU.

Duration of ICU stay	Early lavage	Late lavage	T value	P value
Mean $\pm$ SD	6.4 $\pm$ 2.3	7.6 $\pm$ 2.1	2.613	0.011, Sig

Mean duration of ICU stay in early lavage group was 6.4 days and in late lavage group was 7.6 days. This difference was statistically significant between the early and late lavage groups.

**Table 6:** Distribution of the study groups according to outcome.

Outcome	Early lavage N (%)	Late lavage N (%)
Death	4 (9.3)	8 (17.0)
Survived	39 (90.7)	39 (83.0)
Total	43 (100)	47 (100)

$\chi^2$  value=1.158 df=1 p value, Sig=0.282, NS

The death was present in 9.3% of the early lavage group and 17% of the late lavage group. Almost 90.7% of the early and 83.0% of the late lavage group of patients survived with the incident.

## Discussion

This study was mainly undertaken to study the effect of early gastric lavage on the outcome and duration of stay in ICU of acute poisoning cases. The gastric lavage helps in aspiration of the contents of the stomach and thus reducing the toxicity of the poison consumed. The importance of the gastric lavage must not be neglected mainly in resource limited settings. The early gastric lavage has shown to reduce the respiratory failure which is often recognized as an important cause of death due to cholinergic blockade by the poison.<sup>8</sup>

Majority of the patients in both the groups were aged more than 30 years. Age group of 31–40 years in early gastric lavage and 41–50 years in late group were higher which was statistically significant. A study by Kumar et al. had noted that, the mean age of early gastric lavage group was 31.5 years and late gastric lavage was 32.38 years.<sup>9</sup>

Males in early gastric lavage group and females in late gastric lavage group were higher which was also statistically significant.

Almost 69.8% of the patients with early lavage group and 70.2% in the late lavage group had acute poisoning with organophosphorus poison which was statistically not significant between the two groups.

The mean duration of ventilation in the early lavage group was 1.46 days and late lavage group was 4.53 days which was statistically significant. Mean duration of ICU stay in early lavage group was 6.4 days and in late lavage group was 7.6 days and this difference was statistically significant between the early and late lavage groups. In a study by Kumar et al., the mean duration of ventilation was 14% were put on ventilation in early gastric lavage group and 33% in the late gastric lavage group.<sup>9</sup>

About 9.3% of the patients in early lavage group and 17% of the late lavage group were died during the course of treatment in the hospital. A study by Kumar et al. had reported that, the mortality in early gastric lavage was 23% and late gastric lavage was 32% which was not statistically significant.<sup>9</sup> A study by Andrews et al. noted that, there was no difference in the survival of the patients with respect to early and late gastric lavage.<sup>7</sup> These findings are also supported by Li et al and Merigian et al.<sup>10,11</sup> The absorption of organophosphorus compounds very rapid and it is claimed to be effective within 30 minutes of ingestion. Other emergency procedures should be given priority over gut decontamination.<sup>12</sup>

## Conclusion

This study had shown the early gastric lavage may help in reducing the morbidity of the patients with acute poisoning but not mortality of the patient. The mortality of the patient is mainly decided by the nature and amount of the poison consumed.

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