

Original Research

Assessment of aspiration-induced lung injuries among acute drug poisoning patients

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ABSTRACT:

Background: Inhalation of substances within the lungs is frequently associated with aspiration induced lung injury, which is either due to a direct toxic effect or stimulation of an inflammatory response. The present study was conducted to assess aspiration-induced lung injuries among acute drug poisoning patients. **Materials & Methods:** 108 patients with history of drug or chemical poisoning of both genders were included. Parameters such as poisoning pattern such as type, dose, route and interval between overdose, and presentation was recorded. Chest radiography was performed and positive findings on CXR were defined as the presence of consolidations, pleural effusion, abscess or empyema in the setting of acute respiratory symptoms. **Results:** Out of 108 patients, males were 68 and females were 40. Poisoning cause was accidental in 10, suicidal in 68 and overdose in 30. Number of drugs were single in 54, multiple in 36 and unknown in 18. AVPU responsiveness was alert in 38, voice in 35, pain in 25 and unresponsive in 10. Vomiting was positive in 60 and negative in 48. ETT time was <6 hours in 46, 6-12 hours in 24, 12-24 hours in 20 and >24 hours in 18. Chest x-ray infiltration were seen in upper lobe in 58, middle lobe in 32 and lower lobe in 18. ED management was performed with charcoal in 46, lavage+ charcoal in 57 and none in 5. **Conclusion:** In most cases, poisoning cause was suicidal followed by accidental and overdose.

Key words: Aspiration pneumonitis, charcoal, drug overdose

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INTRODUCTION

Inhalation of substances within the lungs is frequently associated with aspiration induced lung injury, which is either due to a direct toxic effect or stimulation of an inflammatory response. Aspiration of gastric contents into the lower respiratory tract is a common event in critically ill patients, and can lead to pulmonary sequelae. They lead to pulmonary damage due to gastric acid, food and other ingested material (e.g., activated charcoal as in the treatment of overdose).¹

Aspiration pneumonitis (AP) is a common complication of drug overdose.² AP results from the aspiration of gastric contents, which causes acute chemical inflammation and shows a broad spectrum of clinical outcomes, ranging from asymptomatic and self-limiting episodes to the development of severe pneumonitis with rapid progression to acute respiratory distress syndrome. Bacterial colonisation leading to aspiration pneumonia and sepsis are

uncommon sequelae, although in severe cases they may occur.³

The majority of self-poisoning incidents are associated with the ingestion of psychiatric medication (Antidepressants, Mood Stabilizers, Sedative/Antianxiety, Antipsychotics) which impair the level of consciousness and depressed respiration.⁴ Apparent aspiration occurs in up to 70% in obtunded patients, which could have a significant adverse effect on morbidity and mortality in non-intubated patients.⁵ Hospitalized patients are also at greater risk for developing respiratory complications following pulmonary aspiration.⁶ The present study was conducted to assess aspiration-induced lung injuries among acute drug poisoning patients.

MATERIALS & METHODS

The present study comprised of 108 patients with history of drug or chemical poisoning of both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. Parameters such as poisoning pattern such as type, dose, route and interval between overdose, and presentation was recorded. Chest radiography was performed and positive findings on CXR were

defined as the presence of consolidations, pleural effusion, abscess or empyema in the setting of acute respiratory symptoms. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 108		
Gender	Males	Females
Number	68	40

Table I shows that out of 108 patients, males were 68 and females were 40.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Poisoning cause	Accidental	10	0.01
	Suicidal	68	
	overdose	30	
Number of drugs	Single	54	0.05
	multiple	36	
	unknown	18	
AVPU responsiveness	alert	38	0.12
	Voice	35	
	pain	25	
	unresponsive	10	
Vomiting	positive	60	0.05
	negative	48	

Table II, graph I shows that poisoning cause was accidental in 10, suicidal in 68 and overdose in 30. Number of drugs were single in 54, multiple in 36 and unknown in 18. AVPU responsiveness was alert in 38, voice in 35, pain in 25 and unresponsive in 10. Vomiting was positive in 60 and negative in 48. The difference was significant (P< 0.05).

Graph I Assessment of parameters

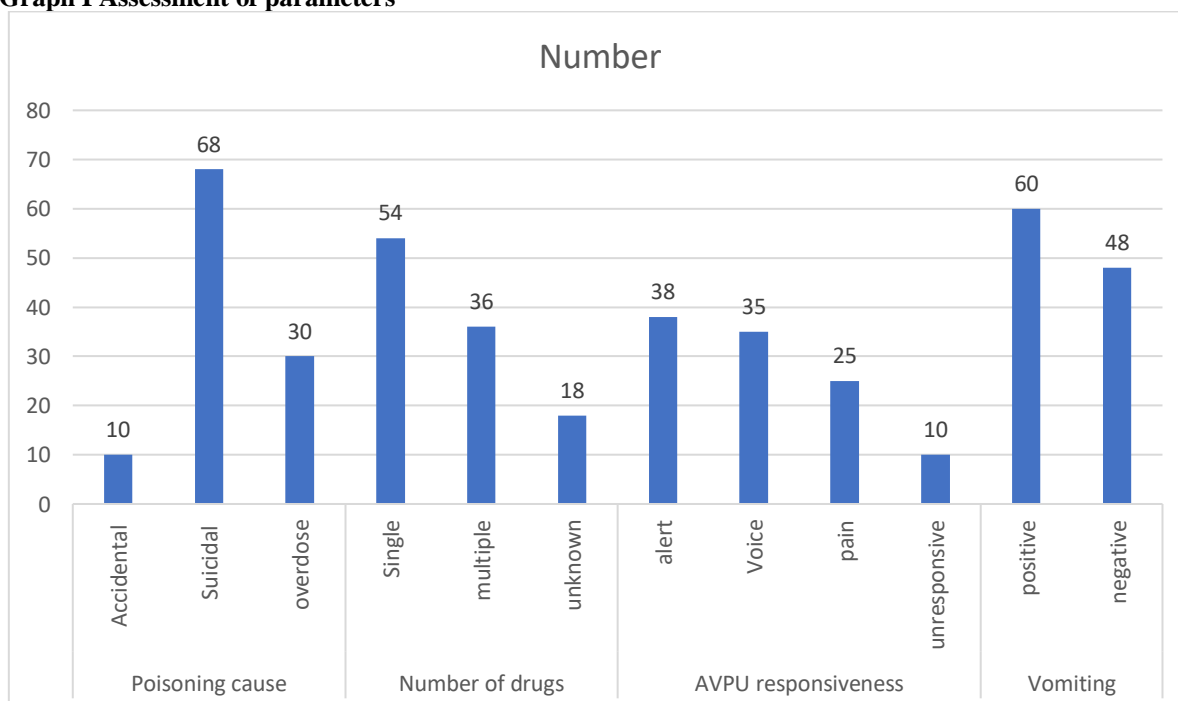
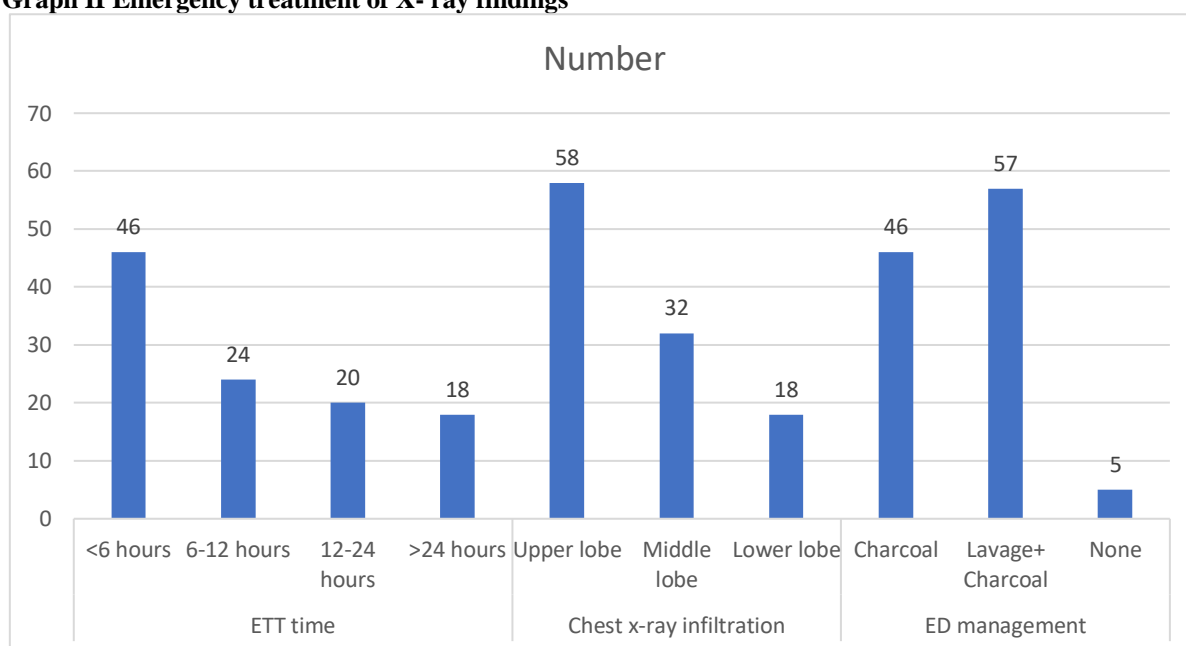


Table III Emergency treatment of X- ray findings

Parameters	Variables	Number	P value
ETT time	<6 hours	46	0.05
	6-12 hours	24	
	12-24 hours	20	
	>24 hours	18	
Chest x-ray infiltration	Upper lobe	58	0.03
	Middle lobe	32	
	Lower lobe	18	
ED management	Charcoal	46	0.15
	Lavage+ Charcoal	57	
	None	5	

Table III, graph II shows that ETT time was <6 hours in 46, 6-12 hours in 24, 12-24 hours in 20 and >24 hours in 18. Chest x-ray infiltration were seen in upper lobe in 58, middle lobe in 32 and lower lobe in 18. ED management was performed with charcoal in 46, lavage+ charcoal in 57 and none in 5. The difference was significant (P< 0.05).

Graph II Emergency treatment of X- ray findings



DISCUSSION

Drug overdose is an important and increasingly frequent cause of admission to the ICU, and accounts for significant morbidity and mortality.^{7,8} In 2001, approximately 15.9 million Americans had used an illicit drug at least once in the month prior to being interviewed. Moreover, hospital use due to overdose has increased.⁹ Mortality rate was 3.9% in a recent report of patients with acute poisoning admitted to the emergency department. Hospitalized patients are also at greater risk for developing respiratory complications following pulmonary aspiration.¹⁰ It may be developed due to a decreased level of consciousness such as conditions; drug overdose, seizures, long-term use of nasogastric feeding tubes, tracheotomy, Poor oral motor skills, depressed cough and gag reflexes, immobility, and decline of respiratory functions.^{11,12} The present study was conducted to assess aspiration-induced lung injuries among acute drug poisoning patients.

We found that out of 108 patients, males were 68 and females were 40. Khodabandeh et al¹³ in their study patients with acute drug poisoning for assessment of aspiration-induced lung were evaluated. 410 participants followed the study. Of those, 249 (61 %) were male and 161 (39%) females. They ranged between 17-55 years. The mode was 25-39 years with frequency of 38%. The mean±SD of age was 32.3±14.5 (Female 34% and Male 27% respectively). The mean age ±SD of females was lower than males (27.3±12.4 vs. 34.4±14.4 years old). An episode of vomiting was recorded positive in 62% (254) of patients. They were recorded by self-reported or witnessed by someone else within the first hours of poisoning. The chest radiograph abnormality was observed mostly in both lungs (45%, 185). They consisted of multifocal patchy infiltrates in lungs 44% (178), diffuse bilateral infiltration 35% (144), and bilateral perihilar consolidation 18% (72) and lobular consolidation 4% (16) mainly in both lung

fields (45%, 185). Aspiration related pulmonary complications attributed to pneumonitis 43.5% (178) including ARDS 35% (144), pneumonia 18% (72), and lung abscess 4% (16). There was a significant relationship with vomiting ($P=0.04$).

We found that poisoning cause was accidental in 10, suicidal in 68 and overdose in 30. Number of drugs were single in 54, multiple in 36 and unknown in 18. AVPU responsiveness was alert in 38, voice in 35, pain in 25 and unresponsive in 10. Vomiting was positive in 60 and negative in 48. Christ et al¹⁴ assessed the incidence and outcome of clinically significant aspiration pneumonitis in intensive care unit (ICU) overdose patients and to identify its predisposing factors. A total of 273 consecutive overdose admissions. Measurements and results: Clinically significant aspiration pneumonitis was defined as the occurrence of respiratory dysfunction in a patient with a localised infiltrate on chest X-ray within 72 h of admission. They identified 47 patients (17%) with aspiration pneumonitis. Importantly, aspiration pneumonitis was associated with a higher incidence of cardiac arrest (6.4 vs 0.9%; $p = 0.037$) and an increased duration of both ICU stay and overall hospital stay. In multivariate logistic regression analysis, Glasgow Coma Scale (GCS) score, ingestion of opiates, and white blood cell count (WBC) were identified as independent risk factors.

We found that ETT time was <6 hours in 46, 6-12 hours in 24, 12-24 hours in 20 and >24 hours in 18. Chest x-ray infiltration were seen in upper lobe in 58, middle lobe in 32 and lower lobe in 18. ED management was performed with charcoal in 46, lavage+ charcoal in 57 and none in 5. Isbister and colleagues¹⁵ reported significantly greater overall mortality in patients with AP than in patients without AP in a very large overdose population.

CONCLUSION

Authors found that in most cases, poisoning cause was suicidal followed by accidental and overdose.

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