Original Article

Clinical Profile and Outcome of Drug Abuse Patients Admitted in Intensive Care Unit of a Tertiary Care Hospital in Kashmir: A Prospective Observational Study

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Abstract

Introduction: Drug abuse is a global public health issue that poses significant challenges to healthcare systems particularly in intensive care units (ICU). This study aims to assess the clinical profile and outcomes of drug abuse patients admitted to ICU of a tertiary care hospital in North India.

Methods: A prospective observational study was conducted over period of 3 years involving drug abuse patients admitted to the ICU. Demographic data, clinical characteristics, substance abuse patterns, co-morbidities, severity scores and outcomes were recorded.

Results: A total of 35 patients were included in the study. All patients were males with a mean age of 29.1(± 11.68). 25 patients were from rural areas. 42.8% were unemployed. Most of the patients (85.7%) were unmarried. 34.3% were students. Mean APACHE II score on ICU admission was 13. Most of patients were admitted for heroin overdose (60%). All 35 patients admitted in ICU had low Glasgow coma scale (GCS< 7). 32 (91.4%) patients had associated respiratory failure. 7 patients had cardiovascular instability. 4 (11.4%) patients developed multi-organ failure during the ICU stay. Mean duration of ICU stay was 3.4 (± 2.68). 23 (65.7%) patients got extubated within 24 hours of ICU admission. 4 patients expired (11.4% mortality) in study group. Sepsis was cause of death in one patient, 3 patients died of multi-organ failure

Conclusion: Most of the overdose was due to opioids specifically of heroin. CNS depression was found in all drug overdose patients followed by respiratory failure. Multi organ involvement have poor outcome. Mortality ensued in 11.4% of admitted patients as a result of sepsis and multi-organ failure. Majority of the patients had good outcome especially patients who presented early to healthcare facility.

Key words: Drug overdose, ICU, outcome

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Introduction

The incidence of drug overdose has increased substantially over the past decade. The availability of more potent novel agents and other potential drug combinations has put a great challenge in controlling this menace and in treating the addicts[1.] Intensive care unit (ICU) admissions of the patients having illicit drug abuse has been found to be rising and has become a major public health concern throughout the world. It has resulted in significant health care cost and hospital resource utilization increasing the burden on already overburdened healthcare system in our region[2].

The increased ICU admissions and higher percentage of deaths has been associated with unintentional drug overdose. Data from various publications show all ICU admissions around 3% to 14%.[3,4,5,6] Acute drug intoxication including alcohol intoxication accounts for 19% of ICU admissions in New York.[2] There has been an increase in ICU admissions by 34% from 2009 to 2015 in USA because of opiate drug overdose.[7] In the west, in-hospital mortality including mortality in ICU in patients with acute intoxication remains around 0.2-4%.[8]In India, prevalence of alcoholism is 4.6%, cannabis abuse 2.8% and opioid use of around 2.1% . Among opioids used in India, heroin remains the highest at 1.14%, followed by pharmaceutical opioids 0.96% and opium 0.52%. The prevalence of opium use in India is three times the global percentage.[9]

Although fatal drug overdose attracts much public attraction, the non-fatal overdoses with their sequelae causes more damage to organ systems like cardiac, renal, musculoskeletal, respiratory system, CNS and physical injuries at the time of intoxication[10]

The management of acute drug intoxication or its complications varies with the nature of the substance used, quantity of drug consumed and any other concomitant substance used. Critical care interventions involve airway and ventilatory management, hemodynamic stabilization and other life-saving procedures like dialysis. The lack or delay in the detection of the unknown substance may pose difficulty in effectively managing the patients in ICU. Substance abuse-related admissions to the ICU in India are common, however there is relatively little scientific literature available regarding characteristics and profile of this population. Specifically, use of ICU resources for chronic alcoholism and drug-related problems, such as complications have not been sufficiently described. Lack of data on drug abuse in ICU may prevent effective management of these patients. This observational study was primarily aimed to study the clinical profile and outcome of drug abuse patients admitted in the ICU of a tertiary care hospital in North India

Material and Methods

This prospective observational study was carried out in an ICU of a tertiary care hospital in North India. This study was conducted from January 2019 to December 2022 after approval from Institutional ethical committee. All patients admitted to ICU with diagnosis of acute intoxication and those with signs and symptoms of acute drug overdose were enrolled in the study. Patients having history of recreational drug abuse and positive urine toxicological screens but admitted in ICU for reasons other than acute intoxication were excluded from the study. Drug intoxication and overdose was referred to as a change in the behavior, consciousness level and/ or disturbance in vital function after having psychoactive drug consumption. Patients suspected of drug abuse were screened through blood/urine toxicological screen using liquid chromatography which is an immunoassay based on the principle of competitive binding. Written informed consent was obtained fromfirst degree relative of patients included in the study.

Demographic parameters like age, gender of patients included in the study were recorded. Other patient related parameters recorded included; reason of drug overdose (recreational, suicidal, accidental), previous history of drug abuse, psychiatry illness, clinical findings at ICU admission, need of mechanical ventilation, vasopressor therapy, urine toxicological screening results, any relevant laboratory finding, days of ICU stay and outcome at ICU discharge. Clinical parameters monitored in the ICU including pulse rate, peripheral oxygen saturation, mean arterial pressure and temperature were also recorded. Drugover dosage was managed as per institutional protocol.

Statistical Analysis:

The recorded data was compiled and exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean ±SD and categorical variables were summarized as frequencies and percentages.

Results

This study included a total of 35 patients admitted to ICU (and fulfilling the inclusion criteria) during the study period. The demographic and sociologic parameters of all patients were recorded.

The mean (± standard deviation SD) age was 29.1 (± 11.68) years with the range of 16 to 65 years.

All the 35 patients included in this study belonged to male gender, no female patient met the inclusion criteria during the study period. 25 patients out of 35 were from rural areas and 10 were from urban background. 42.8% were unemployed, (22.9Most of the patients (85.7%) were unmarried compared to 14.3% patients who were married.22.9% were employed and 34.3% were students. (Table 1)

Table 1: Socio-Demographic Profile

Variable		Number	Percentage (%)
Gender	Male	35	100
	Female	0	0
Marital Status	Unmarried	30	85.7
	Married	5	14.3
Type of Dwelling	Rural	25	71.4
	Urban	10	28.6
Profession	Student	12	34.3
	Unemployed	15	42.8
	Employed	8	22.9

Mean APACHE II score within 24 hours of ICU admission was 13. Most of patients were admitted for heroin overdose (60%). 25 patients had history of substance abuse for the first time, whereas 10 patients were chronic abusers. 34(97.1%) patients used drugs for re-creational purpose, only one patient had drug overdose with suicide intent. (Table 2).

Table 2: Clinical characteristics of study subjects

Variables		Number	Percentage (%)
Drug type	Heroin	21	60
	Synthetic Opioids	2	5.7
	Cannabis	5	14.3
	Benzodiazepine	3	8.6
	Alcohol	4	11.4
Abuse	Chronic abusers	10	29
	First time abusers	25	71
Reason of Overdose	Recreational	34	97.1
	Suicidal	1	2.9
	Accidental	0	0
	Homicidal	0	0

All 35 patients admitted in ICU had low score on Glasgow coma scale (GCS) (GCS< 7) and were mechanically ventilated. 32 (91.4%) patients had associated respiratory failure with type 1 respiratory failure in 29 patients and type 2 respiratory failure in 3 patients. 7 patients were hemodynamically unstable and had vasopressor requirement. 4 (11.4%) patients developed multi-organ failure during the ICU stay. (Table 3).

Table 3: Clinical status of patients at ICU admission

Parameter	Number	Percentage (%)
Low GCS (< 7/15)	35	100
Mechanical Ventilation	35	100
Type 1 respiratory failure	29	82.86
Type 2 respiratory failure	3	8.57
Vasopressor requirement	7	20
≥ two organ system involvement	4	11.4

Mean duration of ICU stay was 3.4 (± 2.68, range 2-11 days), 23 (65.7%) patients got extubated within 24 hours of ICU admission. 88.6% were discharged from ICU, however, 4 patients expired, accounting for 11.4% mortality in study group. (Table 4). Sepsis was cause of death in one patient, 3 patients died of multi-organ failure.

Table 4: ICU stay and Outcome

Parameter	Mean	SD
ICU Stay (Days)	3.4	2.68

ICU Outcome	Number	Percentage(%)
Extubated with 24 hours	23	65.7
Discharged	31	88.6
Mortality	4	11.4

Discussion

Substance abuse is a major problem concerning our population. The substance abuse accounts for significant mortality and morbidity in young population[11]

This is the only study in our region studying utilization of ICU in patients with drug overdose. 35 patients with drug overdose were admitted to ICU during the study period. The diagnosis of all admitted patients was confirmed on the basis of clinical features and laboratory reports. The number of drug overdose patients were 1.75% of total patients admitted in ICU over a period of 3 years. Mean APACHE score in these patients was 13 corresponding to a mortality of approximately 15%. A study by Jose et al found ICU mortality of 2-14% in opioid overdose patients.[2]

The percentage of deaths at ages 15–64 in 2016 in US that are estimated to be drug-associated is 22% for men and 16% for women[12].

The mean age of the patients in our study was 29 (±11.68) years with range of 16 to 65 years. A study on prevalence and patterns of drug abuse in Kashmir valley found most of the abusers were males in the age group of 20-29 years. All our patients were males and none of the patient was of female gender. A survey of United Nations drug control programme found 5.7 % of female drug abusers in Kashmir division. Another survey found 26% of female drug abusers in Kashmir[13]. Plausible cause of no female patient in our study could be due to small sample size.

In our study 85.7% of patients were unmarried as compared to 14.3% patients who were married, similar observation was made by Rather YH et al., who observed 72.34% patients were single (unmarried, divorced or separated) [14]. Possible reason could be marriage may act as a protective factor against drug abuse, long-term committed relationships, like marriage provide the primary form of social support for many individuals[15].When the data was analyzed for type of dwelling, we observed 25 (71.4%) patients were living in rural areas as compared to 10 (28.6%) from urban households.

We noticed 21 out of 35 patients (60%) admitted in ICU were having heroin intoxication. Most common presentation of heroin poisoning was low GCS, miotic pupil and respiratory failure. In one study, most fatal cases of heroin overdose occur in late 20's and early 30's after having intra-venous injections.[16] Cannabis abuse constituted 14.2% patients and was second common substance in our study. All these patients had decreased consciousness level with respiratory failure at presentation. In this study 4 patients had alcohol intoxication comprising 11.4% of all patients included in study. Baldwin et al., found an estimated 10-33% of patients admitted in their ICU had alcohol use disorders.[17] The low percentage in our patients compared to rest of India may be because of social and religious beliefs in majority population where alcohol is considered a taboo[15]The main symptoms of alcohol intoxication in our patients were CNS depression followed by respiratory failure. In this study only 3 patients (8.6%) had taken benzodiazepines in overdose with main symptom being CNS depression. In our study no case of mixed drug overdose was seen.

All 35 patients admitted in our ICU had low GCS (GCS<7) and needed mechanical ventilation. Respiratory failure was found in 32 (91.4%) patients with type 1 failure in 29 patients and type II respiratory in 3 patients. Type 1 respiratory failure was attributed to acute lung injury in 12 patients and 17 patients had aspiration pneumonia. The neurogenic-pulmonary edema secondary to central nervous system depression and increased pulmonary capillary leakage may contribute to acute lung injury in opioid poisoning.[18] Hemodynamic instability was present in 7 patients, which was managed with intravenous fluid and ionotropic support[2]. Multi-organ failure with sepsis developed in 4 patients, these patients deteriorated clinically and all of them expired. Gang et al studied multiple organ dysfunction syndrome in heroin intoxication and

found MODS as a consequences of the primary toxic role of heroin, hypoglycemia, prolonged hypoxia, and ischemia-reperfusion injury[19].

3 patients out of these 4 who died had alcohol intoxication and one had abused cannabis, who presented late to healthcare facility. 34 out of 35 patients had drug abuse for recreation purpose only. In our study 31(88.6%) out of 35 admitted patients in ICU 23 patients were extubated with 24 hours of ICU admission and were discharged. The mean ICU stay was 3.4 (± 2.68) days with minimum stay of 1 day for 23 patients and maximum stay of 12 days. Jayakrishnan et al in their study found that patients stay in the ICU for 1 to 20 days (median-2 days). Factors associated with a longer ICU stay included hypotension upon arrival (p=0.048) and the need for mechanical ventilation on the first (p=0.001) and second (p=0.001) days of hospitalization[4].

Limitations: This study was done as a prospective study for only three years, the study may be underpowered and larger study with larger sample and longer duration might be needed. This was a single institution study, we did not include patients admitted in other ICU's in the region. We did not study long term outcome in these patients.

Conclusion

There has been upsurge in the addiction of opioids among the people specifically of heroin use in our region. CNS depression was found in all drug overdose patients. The respiratory complications have been found at peak among them with acute lung injury followed by aspiration pneumonia and cardio-vascular instability. Multi organ involvement had poor outcome. Mortality ensued in 11.4% of admitted patients as a result of sepsis and multi-organ failure. Majority of the patients had good outcome especially patients who presented early to healthcare facility and remained stable with mild complications and had shorter ICU stay. A high degree of suspicion is to be kept in mind in young patients admitted in ER with CNS depression in whom other causes have been ruled out.

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Author contribution:

RAQ- Implementation of study protocol, data collection, interpretation of data. **SS-** Concept, manuscript preparation. **MJ-** concept, design, final approval, drafting the work. **AHM-** design, statistical analysis, **TK-** revising work for intellectual content. **AWM-** revision and editing. **MK-** statistical analysis, formulating tables.

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