Original Article

Drug use pattern for emergency psychiatric conditions in a tertiary care hospital: A prospective observational study

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Abstract

Purpose: Psychiatric emergencies (PEs) are defined as acute disturbances of thought, mood, behavior, or social relationships requiring immediate interventions. The common emergency psychiatrics are attempted suicide, severe anxiety, schizophrenia, acute psychosis, substance abuse, acute panic attacks, drug toxicities, and extrapyramidal reactions. Emergency physicians in the general hospital may face the challenge of assessing and managing patients in PEs. This study was conducted to evaluate the clinical pattern and drug use pattern for PEs at a tertiary care hospital.

Materials and Methods: This was a cross-sectional, observational study where patients presenting to emergency medical services of a tertiary care hospital were recruited after approval from Institutional Ethics Committee and written informed consent. Demographic details, diagnosis, medication details, cost of the treatment, and adherence to guidelines in the management of emergency psychiatric conditions were assessed using a validated questionnaire. Descriptive statistics was applied to analyze the data.

Results: In 110 patients, a total number of drugs prescribed were 463 (mean: 4.21 drugs/prescription). The most commonly used psychotropic drug in emergency setting was found to be risperidone (19.39%), followed by lorazepam (13.60%) and clonazepam (4.28%). The most common diagnoses were substance abuse (32.72%) and schizophrenia (21.81%). About 74.5% of the physicians prescribed drugs abiding by the standard guidelines. The average total cost incurred by patients was about Rs. 366.

Conclusion: The most commonly used drugs in emergency treatment found in this study are risperidone, followed by lorazepam and haloperidol.

Keywords: Antidepressants, antipsychotics, anxiolytics

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INTRODUCTION

Psychiatric emergencies (PEs) as per definition are acute disturbances of thought, mood, behavior, or social relationships that require immediate interventions.[1] These clinical emergency situations are unique as they may pose risk and danger not only for the patient but also to the people around them. Thus, immediate treatment improves patients' symptoms and behavior. In India, a large epidemiological study conducted by Saddichha *et al.* in 2009 estimated 11.4% of calls for behavioral emergencies

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of all the emergency calls in emergency services.[2] The prevalence of common psychiatric emergency conditions in developing country like India for suicide is 91.2% of all PEs (suicide by poisoning was 60.5% and suicide by other methods was 30.7%), acute psychiatric emergency 4.1% of PEs, and alcohol intoxication 2.7%.[2] Prescribed treatments within the emergency service setting vary depending on the patients' condition.

Despite tremendous progress in the mental health services provided in India, emergency psychiatry care has received little attention in our country. PEs are frequently evaluated and treated by emergency physicians in the general hospital who may face the challenge of assessing and managing patients. After the initial management, these patients are managed by a psychiatrist. These emergency physicians at the primary health-care centers or tertiary hospitals may not be trained to tackle the PEs and may have average knowledge regarding the management of PEs.[3] The literature regarding PEs presenting in general hospital emergency setting in India and their management is scarce. The present study aimed at reporting in data of patients presenting with psychiatric emergency in relation to diagnosis and drug use pattern. This study in our hospital setup would help us to assess the current practices and need for any improvement in these current practices for diagnosis and management of PEs in a general hospital setting.

Thus, it was decided to conduct a study to evaluate the clinical and drug use pattern for PEs at a tertiary care hospital. The management of PEs requires patient care and admission in the ward majority of the time. These admissions in case of PEs add to the cost for the health-care system as well as individual patient. Hence, direct and indirect cost incurred by the patients for the treatment of PEs at the tertiary care hospital was also evaluated.

MATERIALS AND METHODS

An observational, noninterventional, cross-sectional study was conducted in a tertiary care hospital. The study began after approval from the Institutional Ethics Committee (EC/164/2016). Those patients, who presented with psychiatric emergency during the period April 2017–March 2018, were included in the study. Patients of either sex who had presented with any episode of psychiatric emergency in the emergency room now admitted in psychiatry ward and psychiatric emergency patients attending psychiatry outpatient department for follow-up with the age from 18 to 65 years were included in the study. Those patients/legally authorized representatives (LARs) not willing to give informed consent and with any severe systemic illnesses, i.e., cardiac, respiratory, kidney, and neurological, as per a psychiatrist's discretion and pregnant and lactating women were excluded from the study. Written informed consent from the participant was obtained after thorough explanation of the study from the investigator. If a participant was not able to give consent, then consent from LAR was taken. Patients' files/prescriptions were analyzed and the patients/LARs were interviewed to record the study related data in predesigned pro forma under the following headings.

- Sociodemographic details: Age, gender, marital status, education level, and occupation
- Clinical diagnosis:As made by a psychiatrist and stated in prescription (as per the International Classification of Disease 10)
- Drugs used for psychiatric emergencies: Average number of drugs per prescription, average number of psychotropic drugs per prescription, and percentage of psychotropic drugs prescribed by generic name, brand name/route of administration/dose/duration of drugs prescribed for PEs
- Direct and indirect cost for the treatment of emergency episode incurred by a patient: Direct costs are defined as money spent on drugs and investigations and were classified as medical expenditure. Indirect costs are classified as loss of wages due to illness and decreased earning ability due to illness or long-term disability that necessitated change in type of work. Total cost includes the expenditure incurred under direct and indirect costs. The cost was calculated in terms of Indian rupees (INR).

Statistical analysis

The analysis of the data was carried out using SPSS software version 23.0 and Microsoft Excel 2016 version (SPSS Inc., Chicago, Delaware, United States) with basic descriptive statistics.

RESULTS

Demographic profile of the patients

A total of 110 patients were recruited in the study. The median age of the patients was 31 years with a mean ± standard deviation (SD) of 32.94 ± 11.34. The minimum age of the patient recruited was 18 years, and the maximum age was 65 years. Seventy-seven patients were male (70%) and 33 were female (30%). The sociodemographic characteristics of the PE patients are shown in Table 1.

Table 1: Sociodemographic characteristics of psychiatric emergencies patients (*n*=110)

Characteristics	Number of patients (%)
Age (years)	
18–25	37 (33.63)
26–35	34 (30.9)
36–45	22 (20)
46–55	10 (9.09)
>55	7 (6.36)
Gender	
Male	77 (70)
Female	33 (30)
Marital status	
Unmarried	72 (65.45)
Married	38 (34.55)
Education	
Illiterate	4 (3.63)
1–10th grade	70 (63.63)
>10th grade	36 (32.72)
Occupation	
Unemployed	58 (52.72)
Employed	52 (47.28)

Clinical diagnosis

Of the 110 patients, the common diagnoses of PEs included substance abuse (*n* = 36, 32.72%), schizophrenia (*n* = 24, 21.81%), alcohol withdrawal syndrome (*n* = 16, 14.5%), and acute psychosis (*n* = 14, 12.72%). Among the 36 patients presenting with substance use disorders, 16 were cannabis users, followed by 13 cocaine users and 7 nicotine users. Other clinical presentations of PEs presented in the tertiary care hospital are shown in Figure 1.

Drugs prescribed for psychiatric emergencies

A total of 463 drugs were prescribed in the 110 prescriptions, with an average number of drugs per prescription being 4.21 ± 1.29. Drugs prescribed by generic names were 54.9% (254/463), whereas 45.1% (209/463) drugs were prescribed using their brand names. Drugs prescribed by parenteral route, mainly intramuscular (IM), were 73.6% (339/463), whereas 26.4% (124/463) drugs were prescribed by oral route.

Of the total 463 drugs, majority, i.e., 397, were psychotropic drugs (85.74%). The average number of psychotropic drugs per prescription was 3.61 ± 1.09. Of the 397 psychotropic drugs prescribed, majority were antipsychotics (*n* = 173, 43.58%), followed by anticholinergics (*n* = 109, 27.45%) and anxiolytics and hypnotics (*n* = 80, 20.16%). Antidepressants (*n* = 28, 7.05%) and mood stabilizers (*n* = 7, 1.76%) were also prescribed to some patients. Different classes of drugs prescribed in psychiatry emergency settings are mentioned in Table 2.

Among the antipsychotics prescribed, risperidone was the most commonly prescribed antipsychotic drug by the physicians (*n* = 77, 19.39%), followed by haloperidol (*n* = 57, 14.35%). Risperidone was prescribed commonly for the patients diagnosed as substance abuse with comorbid schizophrenia (24/36), whereas haloperidol was commonly prescribed for behavioral control in patients diagnosed as substance abuse (*n* = 26/36), schizophrenia (*n* = 17/24), and all cases of acute psychosis (*n* = 14/14). Benzodiazepine like lorazepam (*n* = 54, 13.62%) and anticholinergic like trihexyphenidyl hydrochloride (*n* = 65, 16.37%) were most commonly prescribed for substance abuse with schizophrenia. Sodium valproate was the most commonly prescribed mood stabilizer (*n* = 7, 1.76%) for substance abuse with cannabis (*n* = 7/36).

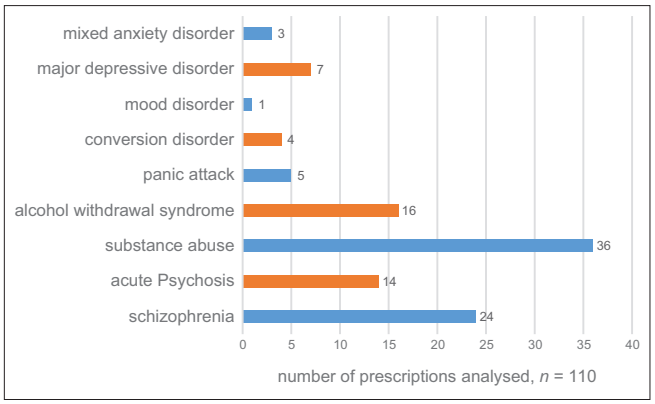

Figure 1: Clinical diagnosis of PE patients

Of the 463 drugs, the remaining 66 (14.26%) drugs were concomitant drugs, i.e., multivitamin tablets (*n* = 25, 5.39%), injection thiamine (*n* = 17, 3.67%), and nicotine gum (*n* = 12, 2.59%) [Figure 2].

Cost incurred by patients for the treatment of psychiatric emergencies

Direct cost ranged from INR Rs. 30 to 450 with mean ± SD (116 + 96). Indirect cost (loss of wages of patient and accompanying person, if any) ranged from Rs. 0 to 2000 with mean ± SD (352 + 247). Hence, the average total cost incurred by patients was about Rs. 366 + 346 for the treatment of PEs [Table 3].

DISCUSSION

PEs are emerging as a major challenge for emergency service departments with the high morbidity and mortality rate due to the rapid growth of various psychiatric conditions.[4] A thorough literature search showed that there was a scarcity in the data for PEs in Indian population. The current study findings gave insight into the common diagnoses and drugs used for PEs in the emergency department setting of the tertiary care hospital.

Table 2: Drugs prescribed for psychiatric emergencies patients (*n*=397)

Drug class/name	*n* (%)
Antipsychotics	173 (43.8)
Risperidone	77 (19.39)
Haloperidol	57 (14.35)
Olanzapine	24 (6.07)
Flupenthixol	7 (1.76)
Trifluoperazine	6 (1.51)
Aripiprazole	1 (0.25)
Clozapine	1 (0.25)
Anxiolytics and hypnotics	80 (20.16)
Lorazepam	54 (13.62)
Clonazepam	17 (4.28)
Diazepam	6 (1.51)
Chlordiazepoxide	3 (0.75)
Anticholinergics	109 (27.45)
Trihexyphenidyl hydrochloride	65 (16.37)
Promethazine	44 (11.08)
Antidepressants	28 (7.05)
Escitalopram	19 (4.79)
Paroxetine	1 (0.25)
Amitriptyline	7 (1.76)
Imipramine	1 (0.25
Mood stabilizer	7 (1.76)
Sodium valproate	7 (1.76)

Table 3: Cost incurred by patients

	Cost head (in Rs.)	Mean±SD	Minimum	Maximum
A	Investigations	11.5±23.93	0	100
B	Drugs	45.5±94.20	0	400
	Medical cost (A+B)	57±118.13	0	500
C	Travel	59±22.95	20	150
D	Direct (A+B + C)	116±96	30	450
E	Indirect	352±247	0	2000
	Total (D+E)	366±346	30	2450

SD=Standard deviation

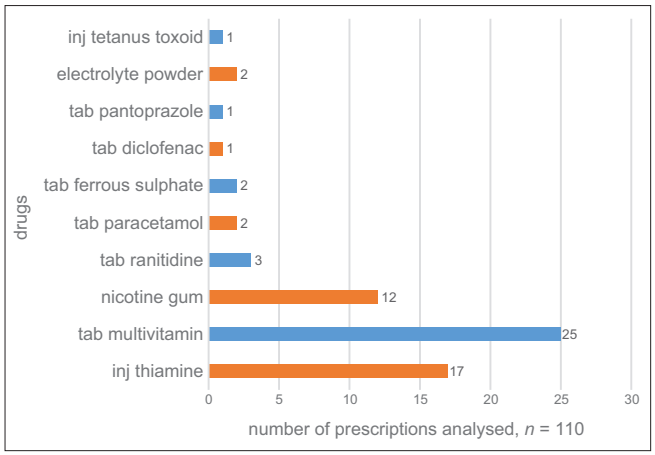

Figure 2: Co-medications prescribed in PEs (*n* = 66)

We found that maximum patients attending the emergency in need of psychiatric consultation are in their third decade of life (32.94 ± 11.34 years). The finding is similar to the studies conducted for PEs in India[5] as well as outside India.[6-8] Our study reported the common representation of male in PEs (70.0%), a finding which is similar to recent Indian study.[9] An Indian study conducted in 1982 by Kelkar *et al.*[10] also has shown male preponderance for emergency psychiatry referrals of general hospital indicating the same trend over the years, whereas studies conducted in Italy[11] and Brazil[12] showed more females seeking emergency psychiatric consultations. The more number of PE presentation by males in our study could be attributed to sociocultural differences as social stigma associated with PEs leads to inhibitions by female patients for seeking psychiatric help.

In our study, the most common PE diagnoses were substance abuse (32.72%) and schizophrenia (21.81), and the findings are similar to the study conducted in Nepal where the common PE diagnosis was substance abuse (30%), followed by mood disorders (23%).[13] In study conducted at Karachi by Shahid *et al.*,[8] diagnoses made by emergency physicians were depression in 29.8%, bipolar disorder in 12%, schizophrenia in 10.6%, deliberate self-harm in 7.2%, and conversion disorder in 3.3%. In contrast to these findings, the most common behavioral emergency presentation in Saddichha *et al.* was suicide.[2] Difference in the findings of this study compared to ours could be due to different methods of data collection and different settings. The abovementioned studies were conducted outside India findings of which are comparable with our study with some variations. Regarding substance use disorder which was the most common presentation in PE at our hospital, approximately 44% (16/36) were cannabis users in contrast to the study conducted by Dadwani and Thomas where the overall prevalence of substance abuse was 18.86% and majority (38.34%) were using tobacco in different forms.[12]

In contrast to our study in which antipsychotics (43.57%) were the most commonly prescribed drugs for PEs, anxiolytics and hypnotics (60.96%) were the most commonly prescribed drugs in a study conducted by Nath *et al.*[5] The change in drug use pattern for PEs seen in both of these Indian studies could be attributed to different geographical locations and cultural differences leading to change in health-seeking behavior. The difference in drug use pattern was also seen for studies conducted outside India in which benzodiazepine like lorazepam was commonly prescribed in emergency psychiatric setting followed by antipsychotics.[7,13]

Among antipsychotics, atypical antipsychotic risperidone was prescribed by oral route commonly for substance abuse disorder (*n* = 36/110) and schizophrenia (*n* = 27/110); however, of these 63 patients, 14 patients were of the combined diagnoses of substance abuse with

schizophrenia. The higher use of atypical antipsychotics in both emergency and nonemergency settings[14,15] could be due to their efficacy for a broader range of symptoms of schizophrenia as well as propensity to cause fewer anticholinergic and extrapyramidal side effects, whereas typical antipsychotic haloperidol was prescribed most commonly for substance abuse ($n = 26/110$) and combined diagnoses of substance abuse and schizophrenia (17/26). This was followed by schizophrenia ($n = 17/110$) and acute psychosis ($n = 14/110$). The use of typical antipsychotics, mainly IM haloperidol, is found to be a little higher in our study than some other studies, which is most likely due to the fact that our data are regarding the prescription pattern of the emergency psychiatry services only and in that setup the primary concern many a times is to control the violent and aggressive behavior of a psychotic patient, which requires parenteral use most of the time.

Among the anxiolytics and hypnotics class of the drugs used for PEs, we found a higher use of benzodiazepines, i.e., lorazepam (13.60%), followed by clonazepam (4.28%) which were prescribed mainly for acute anxiety, substance abuse and to calm the agitated, violent patients. Similar findings were also found in an Indian study conducted by Garekar *et al*.[16] in which patients presenting with aggression and psychosis were prescribed benzodiazepines in the emergency setting.

Lorazepam was the most preferred benzodiazepine in our study because of its reliable absorption and availability as parenteral formulation in the emergency setting. In a study conducted by Nath *et al.,*[5] a significantly higher use of benzodiazepines (98.24%) over nonbenzodiazepines (1.75%) was found. However, among the benzodiazepines, clonazepam use was highest (56.47%), followed by lorazepam (40.6%). Similar findings were reported by Rode *et al*.[17] with 51.83% clonazepam and 32.32% use of lorazepam. NICE guidelines state the use of combination of parenteral IM antipsychotic (haloperidol) and IM benzodiazepines (lorazepam) as a rapid tranquilizer in violent and agitated patients in emergency setting. In our study also, these two drugs were frequently prescribed to a single patient ($n = 34/110$).

Anticholinergic drugs are mostly used to reverse extrapyramidal symptoms resulting from antipsychotic drugs used in the treatment of schizophrenia.[18] Trihexyphenidyl hydrochloride, a centrally acting anticholinergic, was most commonly prescribed (64/109, 59.64%), followed by promethazine (44/109, 40.36%) of total anticholinergics prescribed. In a study by Nath *et al.,*[5] trihexyphenidyl hydrochloride was the only centrally acting anticholinergic used (3.66% of total drugs prescribed), whereas in a study by Padilha *et al.,*[7] promethazine was the only anticholinergic prescribed in the emergency setting. Among the two anticholinergic drugs, promethazine is more commonly used in emergency setting mainly as an additional drug to haloperidol to calm the patients. In our study as well, promethazine and haloperidol combination was used frequently ($n = 43/110$, 39.09%).

The findings of our study for the use of antidepressants in the emergency settings was similar to the study by Nath *et al*.[5] The most common class of antidepressants prescribed in both of these studies were selective serotonin reuptake inhibitors (SSRIs) followed by tricyclic antidepressants (TCAs). In a study conducted in emergency setting, among the SSRI group, escitalopram was the most commonly prescribed drug, followed by paroxetine, and among the TCAs, amitriptyline was preferred followed by imipramine. In a study conducted in Taiwan by Chee *et al*.[19] in nonemergency settings, SSRIs were found to be preferred over other antidepressants. The Indian Psychiatric Society study on antidepressant prescription pattern[20] commented that "escitalopram is the most commonly prescribed antidepressant in India and SSRIs are the most commonly prescribed class of antidepressants." Sodium valproate was the only mood stabilizer prescribed in our study ($n = 7$) for a patient with mood disorder ($n = 1$) and for patients with substance abuse with cannabis ($n = 6$). Findings are similar to that of Nath *et al*.[5] in which sodium valproate (50.94% of total mood stabilizers) and divalproex sodium (48.11% of total mood stabilizers) were almost equally preferred among the various mood stabilizers used. Bipolar disorders themselves may be altered or precipitated by substance use, most notably by stimulants (amphetamines), alcohol, and cannabinoids. The clinical usefulness of mood stabilizers, particularly antiepileptics, has been established as safe and effective in substance abusers with and without comorbid mood disorders. Valproate appears to be a useful medication in these patients due to preliminary evidence demonstrating its anticraving efficacy.[21]

This is the first study where we attempted to calculate the cost incurred by patients in emergency psychiatry setting [Table 3]. The finding is similar to the study by Rejani *et al*.[22] In our tertiary care hospital setup, most of the investigations and drugs are available in hospital pharmacy and are free of cost. However, after discussion with psychiatrists, it was found that some drugs such as escitalopram, olanzapine, and clonazepam are sometimes not available in hospital pharmacy and patients have to purchase these drugs from the outside. Thus, making these

drugs available at the hospital pharmacy is an important concern.

The present study has a few limitations. First, the study was of cross-sectional design, leading to high number of undiagnosed cases and missing data. An ideal study design to study psychiatric emergencies would be a longitudinal follow-up study. Second, there is a lack of comparison data about emergency psychiatry due to very few studies conducted in India as well as outside.

CONCLUSION

It can be concluded from the present study that substance abuse disorder, schizophrenia/psychosis, and acute alcohol withdrawal are likely to be the principal psychiatric presentations in emergency department. A high percentage of these patients were diagnosed for the first time in the emergency care setting; hence, for the prompt management, it is essential to have emergency psychiatry services in every tertiary care hospital. We found that antipsychotics followed by anticholinergics, anxiolytics, and hypnotics were used most commonly among all groups of drugs. The average total cost incurred by patients was about Rs. 366 + 346 for the treatment of PEs. There is also an urgent need to strengthen resources and train the staff for the management of PEs.

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Conflicts of interest

There are no conflicts of interest.

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