Asian Journal of Psychiatry 41 (2019) 34–37

Contents lists available at ScienceDirect

Asian Journal of Psychiatry

journal homepage: www.elsevier.com/locate/ajp

Suicide attempts by drug overdose at Jichi Medical University Hospital emergency centre: A study of patient characteristics and quantity of drug overdose

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ARTICLE INFO

Keywords:
Overdose
Psychotropic drugs
Suicide
Emergency
Multiple hospitalization

ABSTRACT

Objective: Patients attempted suicide by psychotropic drug overdose and require medical care have increased, becoming a serious problem in Japan. This study investigated the characteristics of patients who attempted suicide by overdose and required emergency care, with a focus on quantity of drugs taken.
Methods: We conducted a clinical survey of 98 patients examined at the emergency centre of the psychiatric department of Jichi Medical University Hospital and hospitalized for attempted suicide by drug overdose from January 1, 2012 to December 31, 2014. Data were collected by chart review and subjected to statistical analysis.
Results: Diagnoses were mainly mood disorder and neurosis in both genders. Also, 23.5% of the cases had multiple hospitalizations at the centre, and past overdose was significantly higher in these patients. The average total number of pills/sachets ingested was 84.4 ± 95.5, but no significant difference was noted in dosage according to psychiatric clinic visit history ($P = 0.63$). Of these patients, 45.1% returned to their previous hospital, and 12.2% were hospitalized in the psychiatric ward.
Conclusion: These results are consistent with reports in the literature. Psychiatric outpatient history does not seem to be a risk factor for attempted suicide by ingesting higher drug doses.

1. Objective

The increasing number of patients who attempt suicide by overdosing psychotropic drugs and require emergency medical care is a major problem in Japan. This is taxing on both economic and human resources. To properly utilize available medical resources and alleviate the burden on emergency medical staff, it is necessary to reduce psychotropic drug overdoses.

As clinicians, we sometimes encounter patients who overdose on drugs that we have prescribed. These experiences raise concerns about psychiatric outpatient care being a risk factor for overdose. Although history of psychiatric clinic visits is a risk factor of overdose, it is uncertain whether psychiatric illness (the reason for psychiatric clinic visits) or prescription of psychiatric drugs (the means of suicide) leads the patients to commit suicide.

Callanan and Davis (2012) reported that the odds of suicide by poisoning were significantly higher for those on psychiatric medications. However, there may be regional variations; in Saudi Arabia for example, overdosed drugs are typically analgesics and non-steroidal anti-inflammatory drugs (Bakhaidar et al., 2015).

Mak et al. (2013) compared overdose with non-overdose suicide attempts, but they did not assess the impact of psychiatric outpatient care or prescription of psychiatric medications on suicide attempts. Szymanski et al. (2016) investigated decedents of suicidal drug overdose and reported that most deaths were attributed to multiple drugs.

In addition, a larger quantity of ingested drugs possibly worsens the patients' physical condition, is life-threatening, and wastes medical resources.

Meanwhile, many psychiatric patients have coexisting medical disorders including hypertension and diabetes mellitus, and some drug overdoses involve non-psychotropic drugs such as antihypertensive drugs and hypoglycemic drugs, which can also be life-threatening. However, Hori and Kinoshita (2016) estimated that an overdose of more than 60 tablets of psychotropic drugs should be considered high-risk, requiring intensive care.

Typically, the overdosed drugs are prescription medicines or over-the-counter drugs. Thus, psychiatric outpatients are thought to have easy access to psychotropics. However, the literature does not clarify the association between patient characteristics and the amount of psychotropics overdosed. Thus, the authors hypothesized that

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https://doi.org/10.1016/j.ajp.2018.10.015
Received 10 July 2018; Received in revised form 2 October 2018; Accepted 2 October 2018
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psychiatric outpatient history may be a risk factor for a higher dose of drugs in attempted suicide and a risk factor for life-threatening complications.

In this retrospective study, we investigated the conditions of patients admitted to the emergency centre for attempted suicide by drug overdose, with a focus on the amount of drugs taken.

2. Methods

Subjects were patients hospitalized in the emergency centre of the Jichi Medical University Hospital (JMUH) because of obvious suicide attempt by drug overdose and who were diagnosed as having a mental disorder between January 1, 2012 and December 31, 2014. The emergency centre of the JMUH arranges for all emergency patients with suspected suicide attempt to undergo review at the Department of Psychiatry. The psychiatrists assess the patients' psychiatric diagnosis and risk of repeat attempt of suicide.

We used defined suicide attempt in accordance with the Guidelines of the Japanese Association for Emergency Psychiatry (Hirata and Sugiyama, 2015): (1) the action had been taken of the patient's own will; (2) the patient demonstrated clear suicidal intent; (3) the means was lethal; (4) the patient expected the means to be lethal; (5) suicide ideation was present before the attempt; and (6) the patient left a suicide note, e-mail, or verbal message. Item 1 is mandatory and at least one of items 2–6 is required. If a patient had multiple hospitalizations during the study period, data of only the most recent hospitalization was used. Cases with insufficient clinical records were excluded.

The following information was collected from a chart review: sex, age, psychiatric diagnosis by ICD-10 codes (WHO, 1992) (F0 to F9), psychosocial causes of suicide attempt, clinics the patients had visited and had been prescribed overdosed drugs by (psychiatric clinic or not, JMUH or other hospitals, or no visit),types of drugs overdosed (psychotropic drugs such as antipsychotics, antidepressants, anxiolytics, antiepileptic drugs, or non-psychotropics drugs) and the number of tablets or sachets (for powder formulations) of drugs overdosed. The psychiatric history should be considered in order to evaluate poisoning from psychotropic medicines by counting the number of pills/sachets of medicines taken. This is because it was reported that psychiatry outpatients had significantly higher risk of overdosing on psychotropic drugs (Callanan and Davis, 2012).

The therapeutic environment after treatment at the emergency centre was classified as follows: outpatients or inpatients of the hospital they had previously visited before hospitalization, outpatients or inpatients of a newly introduced hospital, outpatients or inpatients of JMUH, not attending hospital, and others. Others included patients arrested or detained by the police and those who died by suicide.

Statistical analysis was carried out using Excel 2013 and EZR (Ver. 1.35) (Kanda, 2013) and data were analysed with Fisher's exact test and Bonferroni correction. If analysis could not be performed with these tests, we selected the most appropriate analysis method.

This research was approved by the Jichi Medical University Clinical Research Ethics Committee (Approval No.: Clinical A15-100).

3. Results

During the study period, 271 patients underwent psychiatric evaluation in the emergency centre, among which 98 cases (36.2%; 28 males and 70 females) satisfied the inclusion criteria. Mean age was 39.4 ± 15.6 (males 44.2 ± 17.3, females 37.5 ± 14.6) years. There was no significant difference in age between the sexes; age distribution is shown in Fig. 1.

Table 1 shows the psychiatric diagnosis based on ICD codes and the clinics the patients had visited, that is, possible sources of overdosed prescription drugs, by sex.

In total, 23 of the 98 patients (23.5%) experienced multiple hospitalizations at the JMUH emergency centre. There were significant differences in history of medication overdose ($P < 0.01$) and past history of suicide attempts ($P \leq 0.01$) between single and multiple hospitalization patients (Table 2).

Table 3 shows the number of drugs used for overdosing. There was no significant difference between psychiatric hospital visitors and non-psychiatric hospital visitors for each type of psychotropic drug overdosed. Twenty-nine patients used drugs other than psychotropic drugs for overdosing. Twenty-five of these 29 patients (86.2%) had visited a psychiatric hospital.

After discharge from the emergency centre, 53 patients (15 males, 38 females; 45.1%) returned to the original hospital that they had visited before hospitalization. Ten patients (7 males and 3 females; 10.2%) changed and visited other hospitals. Thirty patients were followed up at the psychiatric clinic of JMUH (7 males, 23 females; 30.6%). Only 16 of these 30 patients had originally visited our psychiatric clinic, and 14 patients were referred to us. There were 7 cases with no hospital visits or others (5 males and 2 females; 5.1%).

Twelve patients (4 males, 8 females; 12.2%) were hospitalized in psychiatric wards after treatment at the emergency centre; 10 (4 males, 6 females) of these were admitted to the psychiatric ward of JUMH.

4. Discussion

4.1. Age and diagnosis

Fig. 1 shows the age distribution of the patients. Two peaks are present for both males and females: late teens to early 30 s, and early 40 s to late 50 s. These peaks may relate to adolescent crisis and middle-age crisis, respectively.

Generally, F3 (mood disorders) and F4 (neurotic disorders) account for about 80% of psychiatric diagnoses. Narishige et al. (2014) reported a significantly higher incidence of depressive disorder and bipolar disorder in males, with personality and dysthymic disorders predominating in females, among patients who attempted suicide. Also, Harada et al. (2014) reported a significantly higher number of patients with neurotic and personality disorders and schizophrenia among patients with previous hospital visits, and approximately the same number of patients with mood and neurotic disorders among patients with no hospital visit. A meta-analysis by Kawashima et al. (2014) showed that patients with mood disorders were most frequent among patients with suicide attempts in the emergency centre. Our findings are consistent with these reports.

4.2. Past history of hospitalization, suicide attempt, and overdose

Patients with a history of multiple hospitalization in the emergency centre of JMUH accounted for 23.5% of the suicide attempters. There were no significant differences in sex and presence or absence of prior visits to a psychiatry clinic between single and multiple hospitalization patients. Understandably, patients with multiple hospitalization were likely to have a previous history of suicide attempts and overdose.

A follow-up study by Ando et al. (2013) of 190 patients who were treated at an emergency medical centre in Tokyo for drug overdose revealed 28 patients (42.2%) repeatedly attempted suicide within a year and 2 patients died by suicide. Ando et al. pointed out that patients with a past history of suicide attempts are more likely to have a fatal suicide attempt. In addition, a UK clinical study revealed that 15% of patients under emergency medical examination because of overdose tended to use the same method in a repeated suicide attempt (Teo and Cooper, 2013).

These findings show that a considerable number of patients who attempt suicide by drug overdose tend to be repeatedly brought into emergency centres. These patients apparently have severe mental disorder or rely heavily on the medical care systems. They pose major challenges in emergency medical care, and are taxing on medical staff engaged in emergency care.

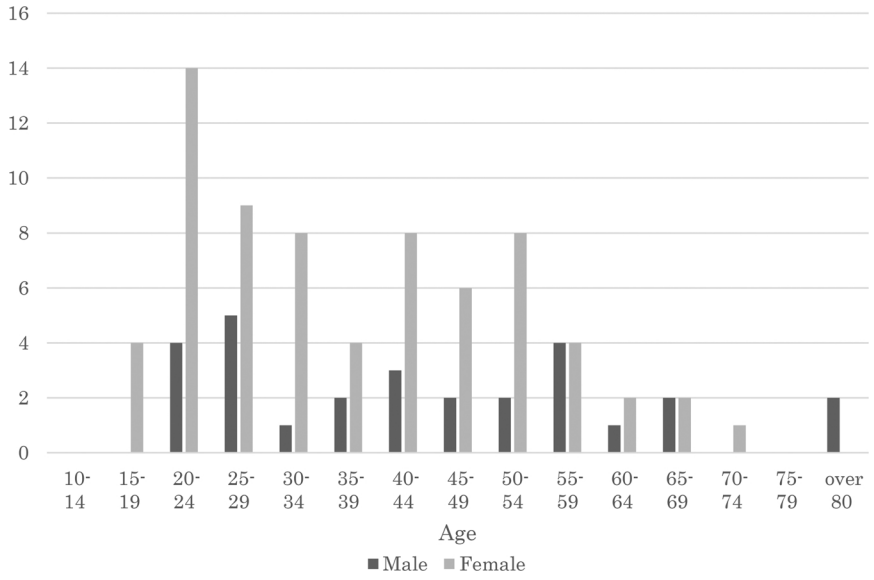

Fig. 1. Age distribution of the subjects.

Table 1
Psychiatric diagnosis based on ICD-10 codes and the clinics patients visited after discharge from the emergency centre.

	Male	Female	Total
ICD-10			
F0	2	0	2
F1	2	2	4
F2	2	9	11
F3	8	24	32
F4	13	34	47
F7	1	1	2
Clinics visited after discharge from the emergency centre			
JMUH psychiatric department	1	15	16
Other psychiatric clinics	15	43	58
JMUH non-psychiatric visits	0	1	1
Other non-psychiatric visits	7	9	16
No visits	5	2	7

*JMUH: Jichi Medical University Hospital.

Table 2
Comparison of clinical features between patients with multiple and single hospitalization in the emergency centre.

	Multiple	Single	Fisher's test
Sex			P = 0.20
Male	4	24	
Female	19	51	
Psychiatric hospital visit			P = 0.18
Yes	20	54	
No	3	21	
History of suicide attempt			P = 1.01e-05
Yes	21	30	
No	2	45	
History of overdose			P = 0.00061
Yes	18	27	
No	5	48	

4.3. Quantity of overdosed medicines

In this study, we investigated the quantity of drugs overdosed. To our knowledge, this is the first report concerning the issue, except Hori and Kinoshita (2016). The drugs overdosed by the patients ranged from psychotropics including anxiolytics, antidepressants, and neuroleptics to non-psychotropic drugs. Currently, there is no objective means of standardization and summation of all drugs overdosed. Thus, we counted the number of tablets/sachets overdosed. Most patients did not know the exact pharmacological effects of the drugs they overdosed. In their understanding, massive overdose may mean ingesting a massive number of tablets or sachets, and not necessarily gross biological activity of the drugs. A higher number of tablets (sachets) seems to reflect the patients' resolve to commit suicide.

Table 3
Quantity (number of tablets/sachets) of overdosed medicines (mean ± SD).

	Total average	Psychiatric hospital visits	No psychiatric hospital visits	t-test
Psychotropic drugs	70.2 ± 84.4	74.6 ± 86.9	56.7 ± 78.2	P = 0.35
Non-psychotropic drugs	14.2 ± 42.7	12.6 ± 26.5	19.1 ± 74.2	P = 0.69
Total quantity of drugs	84.4 ± 95.5	87.2 ± 94.5	75.8 ± 101.9	P = 0.63

The average total number of tablets/sachets, including psychotropic medicines and non-psychotropic drugs, was 84.4. Of the drugs taken, the average number of tablets/sachets of psychotropic drugs was 70.2, 83.2% of the total amount.

There was no significant difference in the quantity of psychotropic drugs between patients with and without psychiatric outpatient history. This suggests that psychiatric outpatient history is not a risk factor for a higher dose of drugs in attempted suicide. Although prescription by psychiatrists may be the major source of overdosed drugs, patients can obtain drugs via other routes, suggesting that the effect of appropriate prescription of psychotropics by psychiatrists for reducing suicide attempt by overdosing is limited.

4.4. Therapeutic environment after treatment in the emergency centre

We confirmed that 45.1% of the patients continued to visit their previous hospital after discharge from the emergency centre. After treatment in the emergency centre, 12.2% of the patients were hospitalized in the psychiatric ward of JMUH or another hospital, with most of these patients (83.3%) being hospitalized in the psychiatric ward of JMUH. In a UK study, 84% of the patients who visited the emergency centre consulted psychiatrists, and 9% were hospitalized in a psychiatric ward (Teo and Cooper, 2013).

This suggests that the majority of patients who attempt suicide and are brought to emergency centres require psychiatric care. Emergency centres may become the entry point to psychiatric care for such patients, but by the time they present to emergency centres, such patients are likely to be in a life-threatening condition already. We must support them by facilitating access to mental health professionals before they attempt suicide.

5. Limitations

This research was carried out retrospectively, and the evaluation was based on chart review. The evaluation of suicide attempts did not involve the use of objective instruments such as the Suicide Intent Scale (Beck et al., 1974).

6. Conclusion

The characteristics of the patients in our study correspond approximately to those in the literature. Most of the patients needed psychiatric care. However, psychiatric outpatient history does not seem to be a risk factor for ingesting a higher dose of drugs in attempted suicide.

Financial disclosure

None.

Conflict of interests

None to declare.

Acknowledgements

None.

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