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Prescription drug suicide in non-abusers: A 6-year forensic survey

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ABSTRACT

Background: Prescription drug suicide merits study to guide the development of strategies to reduce suicide risk. We examined prescription drug suicide specifically in non-abusers of prescription drugs; this is a relatively unexplored subject.

Methods: Six-year data on prescription drug suicide in non-abusers were extracted from the records of the Department of Forensic Medicine at the All India Institute of Medical Sciences, New Delhi. These records contained information obtained from the scene of the suicide, from interviews with relatives of the deceased, and from forensic toxicological analyses at two laboratories.

Results: There were 27 (8%) cases of prescription drug suicide in non-abusers out of 338 cases of suicidal poisoning. The mean age of this sample was 26 years. The sample was 74% male. Nearly half of the cases (44%) were students. A combination of dextropropoxyphene with dicyclomine, with or without paracetamol, was used by 41% of cases. Overdose was achieved through the ingestion of 10–40 (median, 30) tablets or by the injection of 2–3 (median, 2) vials of medication. In 52% of cases, it appeared that the drugs had been procured over the counter.

Conclusions: It is reassuring that the absolute number of prescription drug suicides in non-abusers was small; the findings, however, are important because they could serve as a baseline for assessing time trends in future studies. For the present, we suggest that prescription drugs of potential abuse, especially those containing opioids and antispasmodics, should be prescribed and dispensed judiciously, especially to youth.

1. Introduction

In many countries, prescription drugs are easy to obtain over the counter from a pharmacist, or by using other patients' prescriptions at pharmacies, or even without a prescription either from a pharmacy or from internet-based suppliers. Prescription drugs may also be covertly obtained from family members who are receiving the medications for legitimate indications. The drugs are commonly inexpensive in generic versions, unassociated with social stigma, and carry low legal risks. Prescription drugs may also have fewer adverse effects than street drugs and are preferred when street drugs are hard to source. In this context, a national survey in the USA found that prescription drug abuse is concentrated in rural, suburban, and small to medium urban areas; there was little abuse of prescription drugs in large metropolitan areas. It is possible that the marketing of newer drugs with sedative, analgesic, anxiolytic, anaesthetic, or stimulant properties has stimulated the growth of prescription drug abuse (Maxwell, 2006; Hernandez and Nelson, 2010; Inciardi et al., 2010).

An important concern is that prescription drug abuse may be associated with fatality, the rates of which may increase with the increase in the rates of abuse. In this context, in a US study, fatality associated with prescription drugs was mainly due to accidental overdose whereas in Britain it was mostly suicidal (Matthew, 1966; Wysowski, 2007).

Prescription drugs have been associated with fatality in India, too. The National Crime Record Bureau of the Government of India stated that fatalities associated with prescription drugs are mainly accidental overdose following over the counter procurement and use for common medical ailments (National Crime Record Bureau, 2015). However, in a survey of poisoning at a teaching hospital in North-Eastern India, prescription drugs were reported to have been used to attempt suicide in

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about one-third of cases (Ropmay et al., 2014).

Given these concerns, and given the need to address preventable causes of suicide, we embarked on a study of the magnitude of prescription drug-related suicide in Delhi, the capital city of India. However, and importantly, we specifically excluded prescription drug abusers because of the real possibility that the death was unintentional and due to abuse-related toxicity rather than overdose with suicidal intent. We specifically focused on suicide in non-abusers because persons with suicidal intent are likely to choose the easiest method at hand, and prescription drugs may represent a convenient resource. Thus, we examined a relatively unexplored area, and one that might be important in third world countries in which access to prescription drugs is easy.

2. Methods

2.1. Study design

This study was a retrospective chart review, based on an analysis of records for a 6-year period, 2010-2015. The study was conducted in the Department of Forensic Medicine at the All India Institute of Medical Sciences, New Delhi, India. The study protocol was approved in the Department, in accordance with ethics-related procedures followed in the Institute, at the time, for studies based on retrospective data analysis.

2.2. Sampling

The sample for this study comprised all persons who had completed suicide by presumed deliberate overdose with prescription drugs during the years 2010-2015. These persons were identified by screening the files of all cases of suicidal poisoning. Persons were excluded if they were chronic abusers of the drugs believed to have been used in the suicide completion. In this context, chronic abuse was determined as described in the next subsection.

2.3. Data extraction

All information for this study was obtained from the case files in the Department archives. This information had been obtained from multiple sources, including from police files, and by formal interview of the relatives of the deceased at the time of the autopsy.

Information extracted about the deceased included age, sex, and occupation of the deceased, the source of the drug(s) used to commit suicide, and whether the deceased had a history of chronic abuse of that drug or any other drugs. Judgements about the history of abuse were based not only on information from friends and relatives but also from a history of social and personal behaviour congruent with drug abuse, and from the recovery of drugs, needles, and related materials from the place of residence of the deceased or the place of the suicide.

What prescription drug(s) of what strength had been used to commit suicide, and in what quantities these drugs had been used, were estimated from the empty strips or vials recovered from the scene of the suicide. The presence of the drug(s) in the blood of these cases was confirmed through the reports from the state-run Forensic Science Laboratory and also from Departmental laboratory.

3. Results

3.1. Sociodemographic description

During the period of study, there were 338 cases of suicidal poisoning. These included 201 (59.5%) males and 137 (40.5%) females. Among these, there were only 27 (8%) cases who were non-abusers of prescription drugs and who had completed suicide using prescription drugs (Table 1). Interestingly, there were no abusers of prescription drugs among the 338 cases.

The study sample (n = 27) included 20 (74.1%) males aged 21–34 (mean, 26) years and 7 (25.9%) females aged 22–32 (mean, 26) years. Gender distribution did not differ significantly between cases of prescription drug suicide and suicide by other methods of self-poisoning (Chi square = 2.60; df = 1; P = 0.11).

Nearly half of the sample (n = 12; 44.4%) comprised students. There were 6 unemployed men, 4 doctors, 3 housewives, and 2 manual laborers.

3.2. Drugs, quantities, and methods of administration

Eleven (40.7%) cases had overdosed with a combination of dextropropoxyphene and dicyclomine; in 4 of these cases, the combination contained paracetamol, as well. Six cases overdosed with a benzodiazepine (alprazolam, diazepam, nitrazepam, midazolam), two with insulin, and one each with nitroprusside, carbamazepine, amitriptyline, sertraline, metoprolol, pheniramine, ketamine, and promethazine. In three cases, the drug used in overdose could not be identified from the foils retrieved from the scene of the suicide.

Four cases overdosed with a benzodiazepine (commonly, alprazolam) along with another drug. One student with a history of heroin abuse and four doctors overdosed by parenteral prescription drug administration. The student overdosed with pheniramine, and the doctors with nitroprusside, insulin, and midazolam with ketamine. The remaining cases overdosed with oral medications.

Parenteral overdose was achieved through the injection of between 2 and 3 (median, 2) vials of medications. Oral overdose was achieved through the ingestion of 10–40 (median, 30) tablets.

3.3. Source of the drugs

In 14 cases (52%) the drugs had been obtained directly, over the counter, without a known prescription. In 3 cases the medication had been prescribed for the deceased, and in 3 cases the medication had been prescribed to a family member of the deceased. All four doctors in the sample had procured their drugs from hospital supplies. Finally, in 3 cases the source of the drug was not known.

4. Discussion

Across the world, unintentional drug deaths with prescription drugs have been reported, many of which were associated with prescription and other drug abuse (Hall et al., 2008; Paulozzi et al., 2012; Office for National Statistics, 2016; European Monitoring Centre for Drugs and Drug Addiction, 2016; Monheit et al., 2016). Time trends suggest increasing fatality rates with prescription drugs (Novak et al., 2016), though no differentiation was made between accidental and deliberate overdose.

Prescription drugs have been used for suicide attempt (Gavrielatos et al., 2006), including in India. A study from North-Eastern India showed that prescription drugs had been used by a third of suicide attempters (Ropmay et al., 2014). A study from Central Karnataka showed that about 18% of suicide attempters had overdosed with various prescription drugs (Gouda and Rao, 2008). Neither study (Ropmay et al., 2014; Gouda and Rao, 2008) indicated the source of the drugs.

Prescription drugs have also been used in suicide completion (Monheit et al., 2016). Indian data on fatal prescription drug overdose, unintentional or intentional, are available with the National Crime Record Bureau (NCRB) under the Ministry of Home Affairs, Government of India, but these data are unlikely to be complete. The NCRB

Table 1
Details of cases of suicide with prescription drugs.

Age (in yr)	Sex	Drugs recovered at the scene	Dose taken	Occupation of the victim	Source of drug
34	Male	Sodium Nitroprusside 25 mg/ml	3 × 2 ml vial	Doctor	From hospital supply
32	Male	Carbamazepine 400 mg	10 tablets	Manual worker	Prescribed for his epileptic brother
23	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg	30 tablets	Student	Over the counter
25	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg	40 tablets	Student	Over the counter
28	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg	30 tablets	Student	Over the counter
32	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg	30 tablets	Unemployed	Over the counter
32	Female	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	35 tablets	Housewife	Prescribed for spasmodic pain of her husband
33	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	35 tablets	Student	Over the counter
22	Female	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	35 tablets	Student	Over the counter
25	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	40 tablets	Manual worker	Over the counter
26	Female	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	35 tablets	Housewife	Prescribed for spasmodic pain of her husband
22	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	30 tablets	Student	Over the counter
23	Male	Combination* of Dextropropoxyphene 65 mg + Dicyclomine 10 mg + Paracetamol 400mg	40 tablets	Unemployed	Prescribed to him for spasmodic pain
25	Female	Diazepam 10 mg	30 tablets	Housewife	Over the counter
28	Female	Insulin-Lispro 100 IU/ml	2 × 3 ml vial	Doctor	From hospital supply
24	Male	Insulin-Lispro 100 IU/ml	2 × 3 ml vial	Doctor	From hospital supply
28	Male	Nitrazepam 5 mg	30 tablets	Unemployed	Over the counter
22	Female	Alprazolam 1 mg and Promethazine 50mg	Alprazolam 30 tablets Promethazine 30 tablets	Student	Over the counter
24	Male	Alprazolam 1 mg and Diazepam 10 mg	Alprazolam 35 tablets Diazepam 30 tablets	Unemployed	Over the counter
22	Male	Alprazolam 1 mg and Sertraline 50mg	Alprazolam 30 tablets Sertraline 30 tablets	Student	Prescribed to him for depression
28	Male	Midazolam 5 mg/ml and Ketamine 100 mg/ml	Midazolam 2 × 5 ml Ketamine 3 × 5 ml	Doctor	From hospital supply
25	Male	Pheniramine 22.75 mg/ml	2 × 10 ml vial	Student	Over the counter
28	Female	Amitriptyline 100mg	20 tablets	Student	Prescribed to her for depression
23	Male	Unknown†	30 tablets	Unemployed	Not known
28	Male	Unknown†	30 tablets	Student	Not known
25	Male	Unknown†	35 tablets	Unemployed	Not known
21	Male	Metoprolol 50 mg	35 tablets	Student	Over the counter

statistics for 2015 showed that 2.8% of suicidal deaths were due to drug abuse/addiction, but underreporting is almost certain, and the data did not differentiate between drugs of abuse and prescription drugs (National Crime Record Bureau, 2015). Our study is an effort to attract attention towards prescription drug suicide in urban India. To the best of our knowledge, our study is the first to address prescription drug suicide in non-abusers of prescription drugs.

4.1. Findings of the present study

In the present study, across a 6 year period, there were 338 cases of suicidal poisoning among whom only 27 were non-abusers of prescription drugs who had completed suicide using prescription drugs. These cases were mostly young males; nearly half of the cases were students. In 40% of cases, suicide was the result of the use of an opioid-antispasmodic drug combination. Only 5 cases, 4 of whom were doctors, had overdosed with parenteral medications; the oral overdoses involved the ingestion of a median of 30 tablets. In half of the cases, the drugs had been obtained over the counter and without a prescription. In only 3 cases had the drugs been obtained from the household, having been prescribed to a family member.

4.2. Implications of the findings

Persons who wish to end their lives for any reason may overdose on drugs that are lying around in the house, having been prescribed to a member of the family. Hoarding of medicines at home is a known risk factor for even accidental overdose (McHugh et al., 2015). An important reassurance in our study is that there was a very low rate of misuse of household prescription drugs for suicide completion. A caveat here, however, is that there may be a high rate of nonfatal overdose with prescription drugs obtained from domestic sources; our data do not capture this information. Therefore, patients who are prescribed potentially hazardous drugs should continue to be warned to keep the drugs in a safe place, where they cannot be accessed by unauthorized persons, particularly by young adults in the household who may be emotionally disturbed.

More of concern was the finding that opioid-antispasmodic combination drugs were obtainable over the counter and were used for suicide by a substantial proportion of cases. An action point here is that such drugs should not be issued without a prescription. It would, of course, be ideal to require all drugs that are lethal in overdose to be issued only by prescription, but this is not practical because almost all drugs can be lethal in overdose, including some that are legally available over the counter in most countries.

Due to the addictive nature of dextropropoxyphene and its limited efficacy, the Government of India had issued a notification suspending its manufacture, sale, and distribution in the country since May 2013 (Gazette of India, 2013); however, this drug was still available over the counter in the year 2015, as found in our study. This is a matter of concern, and further governmental and administrative action may be necessary to address the problem.

4.3. Limitations of the study

The information presented in this study was based on case files, and these, in turn, recorded data obtained from the scene of the suicide, from the place of residence of the deceased, and/or from the friends and relatives of the deceased. It is therefore uncertain to what extent conclusions were accurate. This could be of particular concern in the case of the many opioid suicides, some of whom might have been regular users unbeknownst to their families. However, we followed standard forensic procedures and these could not have been improved upon.

We acknowledge that the milligram strength of a tablet, the LD50 of the contents of the tablet, and other matters are indices of the lethality of the overdose. However, the number of tablets ingested is nevertheless an important criterion because it indicates the strength of the suicidal intent.

5. Conclusions

Prescription drugs of potential abuse, especially those containing opioids and antispasmodics, may be used to complete suicide even by persons who are not abusing these drugs. Prescription drugs, therefore, should not be issued without a prescription, and should not be left in places in the household that may be accessed by suicidally inclined young members of the household.

Author roles

AKS designed the study, extracted and compiled the data during his residency (in the Department of Forensic Medicine, in the Institute in which the study was conducted), and prepared the draft of the manuscript. AS and VVP contributed ideas to the design of the study and the content of the manuscript. CA defined the focus of the manuscript, assisted with the preparation of the results, and wrote the final version of the manuscript. All authors approved the final version of the manuscript.

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Declaration of competing interest

We have no conflicts to declare with regard to the contents of this manuscript.

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