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## Drug overdose: a wake up call! Experience at a tertiary care centre in Karachi, Pakistan

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### Abstract

**Objective:** To study the characteristics of patients admitted with drug overdose caused either by accidental overdose of the prescribed medications or as an act of deliberate self harm (DSH) at a tertiary care hospital in Karachi, Pakistan.

**Methods:** A retrospective case series review was conducted at the Aga Khan University Hospital from January 2002 to October 2006. Three hundred and twenty four adult patients admitted with drug overdose were included in the study.

**Results:** Our sample group revealed mean age of  $36.2 \pm 17.0$  years, more females (59%), housewives (34%), and students (20%). Fifty six percent of patients committing DSH were married ( $p=0.001$ ), 81% needed in-patient psychiatric services ( $p=0.016$ ) of whom a significantly high number (38%) refused it. Domestic and social issues were rated highest among DSH group ( $p=0.003$ ), depression among females was common ( $p=0.028$ ) and Benzodiazepines (41%) was the most frequently used drug ( $p=0.021$ ). Sub-group analysis of accidental overdoses revealed mean age of  $45.6 \pm 19.6$  years, single (75.4%) and males (54.1%). Drugs used were mainly Benzodiazepines (18%) followed by Opioids (11%), Antiepileptics (10%) and Warfarin (10%).

**Conclusion:** Our study showed that depressed housewives are at greater risk for DSH. Domestic and social issues were rated highest and Benzodiazepines were the most commonly used agents. Most of our patients refused inpatient psychiatric treatment leading us to believe that general awareness of psychiatric illnesses is imperative in our community. High number of accidental overdoses is alarming in older, single males convincing us to believe that existing pharmacy system needs further evaluation and modification (JPMA 58:298;2008).

## Introduction

A drug overdose is the accidental or intentional use of a drug or medicine in an amount that is higher than the recommended safe dose.<sup>1</sup> Deliberate self harm (DSH) and accidental overdose are common medical emergencies adding to the burden of diseases to any health care system.

DSH is a non-fatal act of self harm carried out deliberately in the form of an acute episode of behaviour by an individual with variable motivation.<sup>2</sup> The intention to end life may be absent or present to a variable degree. Other terms used to describe this phenomenon are "attempted suicide" and "parasuicide".<sup>2</sup> DSH is not defined by the American Psychiatric Association in the Diagnostic and statistical manual of mental disorders (DSM IV)<sup>3</sup> or by World Health Organization in the International classification of mental and behavioral disorders (ICD-10).<sup>4</sup>

An overdose can be classified as accidental under two circumstances.<sup>5</sup> The first is substance abuse of prescribed or non-medical substances for the purpose of producing a change in mood, in a non-medical manner. Second, if it was caused by the inadvertent reaction between two prescription drugs, or the ingestion of prescribed drugs that exceed the prescribed dosage.<sup>5</sup>

In Pakistan both suicide and DSH are illegal acts, punishable with a jail term and financial penalty.<sup>6</sup> There are strong religious and socio-cultural norms against suicidal behaviour.<sup>6</sup> Despite this, there is accumulating evidence that incidences of both suicide and DSH have increased in recent years.<sup>6</sup> The prevailing issues of poverty, unemployment, corruption, human rights violation, denial of justice, discrimination, violence, loosening of cohesion in society, which are on the rise, may be contributing to rise in suicidal tendencies in Pakistan.<sup>7</sup>

To the best of knowledge of the authors, no recent study from Pakistan has looked at the characteristics of patients with accidental overdose as well as DSH with drugs. The objective of the study, was to identify the characteristics of patients who were admitted with either accidental overdose of the prescribed medications or as an act of DSH with drugs at a tertiary care hospital in Karachi, Pakistan.

## Methods

A retrospective case series review was conducted at the Aga Khan University Hospital (AKUH), Karachi, Pakistan from January 2002 to October 2006. Three hundred and twenty four adult patients (age = 16) admitted in the medicine service of AKUH over a period of 5 years with the diagnosis of drug overdose were included in the study. The discharge diagnosis of drug overdose caused

either by accidental overdose of the prescribed medications or as an act of DSH with drugs was made by the Attending Physician. To record details of patients presenting with DSH with drugs and accidental drug overdose, a special data extraction form was devised. Demographic details of patients, type, route and quantity of drug used, reason of drug ingestion, past psychiatric history, prior history of overdose, psychiatric consult, presentation in the emergency department and outcome were recorded.

All variables were entered into Statistical Package for Social Sciences (SPSS version 13 copyright © SPSS Inc.). Means and standard deviations were calculated for continuous variables and frequencies for categorical variables. Cross tabulation was done to determine the relationship between different variables. Descriptive analysis was performed and a two-tailed p-value of <0.05 was considered statistically significant.

## Results

During the study period, three hundred and twenty four adult patients were admitted in AKUH with drug overdose. Out of these, 202 were admitted due to DSH with drugs while 122 were admitted in the hospital due to accidental overdose. Majority of patients were young with mean age of  $36.2 \pm 17.0$  years and 59% were females. Sixteen percent of patients had at least one previous attempt of DSH. Mean hospital stay was 3.88 days. Fifty five percent of the patients were admitted in ward, 29.6% in special care unit and 15.4 % in intensive care unit.

**Table 1. Demographic Details of Patients with Drug Overdose**

| Characteristics                      |          | Deliberate self harm | Accidental overdose |
|--------------------------------------|----------|----------------------|---------------------|
| Mean Age (SD*)                       |          | 30.5(±12.1)          | 45.6(±19.6)         |
| Mean Duration Of Hospital Stay (SD*) |          | 3.44 (±3.9)          | 4.61 (±4.9)         |
| Gender                               | Male     | 66 (32.7)            | 66 (54.1)           |
|                                      | Female   | 136 (67.3)           | 56 (45.9)           |
| Marrital status                      | Single   | 88 (43.6)            | 92 (75.4)           |
|                                      | Married  | 114 (56.4)           | 30 (24.6)           |
| History of overdose                  | Once     | 24 (11.9)            | 0                   |
|                                      | Twice    | 8 (4.0)              | 1 (0.8)             |
|                                      | Numerous | 19 (9.4)             | 0                   |
|                                      | None     | 151 (74.8)           | 121(99.2)           |
| Place of stay in hospital            | Ward     | 94 (46.5)            | 84 (68.9)           |
|                                      | Sp. Care | 67 (33.2)            | 29 (23.8)           |
|                                      | ICU      | 41 (20.3)            | 9 (7.4)             |
| Psychiatric consult                  | Done     | 177 (87.6)           | 24 (19.7)           |
|                                      | Not done | 25 (12.4)            | 98 (80.3)           |

\*Standard Deviation

**Table 2. Drugs used in DSH and Accidental Overdose**

| Drugs used                 | Deliberate self harm<br>n (%) | Accidental overdose<br>n (%) | Total cases<br>n (%) |
|----------------------------|-------------------------------|------------------------------|----------------------|
| <b>Benzodiazepines</b>     | 111 (55)                      | 22 (18)                      | 133 (41)             |
| <b>Antidepressants</b>     | 21 (10)                       | 2 (2)                        | 23 (7)               |
| <b>NSAIDs/analgesics</b>   | 22 (11)                       | 2 (2)                        | 24 (7)               |
| <b>Antiepileptics</b>      | 8 (4)                         | 12 (10)                      | 20 (6)               |
| <b>Alcohol</b>             | 2 (1)                         | 2 (2)                        | 4 (1)                |
| <b>Oral Hypoglycaemics</b> | 3 (2)                         | 8 (7)                        | 11 (3)               |
| <b>Opioids</b>             | 4 (2)                         | 13 (11)                      | 17 (5)               |
| <b>Organophosphate</b>     | 6 (3)                         | 1 (1)                        | 7 (2)                |
| <b>Digoxin</b>             | 0 (0)                         | 11 (9)                       | 11 (3)               |
| <b>Warfarin</b>            | 0 (0)                         | 12 (10)                      | 12 (4)               |
| <b>Immuno-suppressants</b> | 0 (0)                         | 7 (6)                        | 7 (2)                |
| <b>Miscellaneous</b>       | 25 (12)                       | 30 (25)                      | 55 (17)              |
| <b>Total</b>               | 202                           | 122                          | 324                  |

Drowsiness was the most common presentation in the Emergency Department. During hospital stay 62% of the patients were given psychiatric consult (87% in DSH and 19% in accidental overdose). Eighty one percent of the patients committing DSH needed admission in psychiatric service ( $p=0.016$ ) compared to 14% of patients presenting with accidental overdose. While 25% of the patients refused to stay under the psychiatric service in the hospital (38% in DSH and 3% in accidental overdose). Demographic details are given in Table 1.

Out of the study sample there were 34% housewives, 20% students, 9% of the patients were doing some kind of public or private job, 8.3% were businessmen or self-employed, 5.6% were retired, 4.3% were unemployed and 3.1% were doctors .

Benzodiazepines were the most frequently used drug for DSH (41%); especially by females ( $p=0.042$ ). Drugs involved in accidental overdose were mainly benzodiazepines (18%), opioids (11%), anti-epileptics (10%) and warfarin (10%). Details are given in Table 2.

Amongst the DSH cases in study population, 58.4% of the patients were diagnosed on discharge with depression, 10.9% with bipolar disorder, 5.4% showed an acute stress reaction, 3% had personality disorder, 3% had schizophrenia, 2.5% had adjustment disorder and 1% had obsessive compulsive disorder.

Domestic and social issues were the most common reason for DSH 70.3% ( $p=0.003$ ) followed by prior psychiatric history (9.9%), financial issues (4.5%), failure in exams (4%), death of relative (3.5%) and stress at work place (1%).

Almost all patients were discharged alive ( $p=0.025$ ). There were no deaths reported from DSH with drugs during the study period, while the case fatality rate of accidental overdose was 2.5%.

## Discussion

DSH contributes substantially to global mortality, accounting for an estimated 877,000 deaths by suicide in 2002.<sup>8</sup> The influence of cultural values, social stigma, incentives to avoid medico-legal complications and a poor infrastructure for documentation in some areas all contribute to serious underestimates of suicide and DSH.<sup>9</sup> Persistent media reports and a heavy clinical burden, however, indicate the priority of suicide and suicidal behaviour.<sup>9</sup> About half of the people who ultimately kill themselves have a history of DSH, and 20-25% of persons who die by suicide may have a history of DSH within the previous year.<sup>9</sup> Research has also shown that DSH is often not a singular occurrence, but is commonly repeated and can go on for many years.<sup>10</sup> This was evident in our study as a significant number of patients admitted with drug overdose had previously attempted DSH at least once.

Instances of self-harm are frequently associated with feelings or symptoms of depression, including clinical depression, as well as personality disturbance or disorder.<sup>11,12</sup> A vast majority of patients were suffering from depression at the time of admission in our study.

Recent literature acknowledges the importance of cultural differences in the motivation of suicidal behavior.<sup>9</sup> Questions have arisen about differences in the relative emphasis on psychopathology in much of the Western literature, which typically attributes 90% of suicides to mental disorders<sup>13</sup>, and contradictory findings from Asian research, which emphasizes social contexts and stressors.<sup>9</sup> Findings emphasized social stressors, including financial problems, family conflicts, illicit relationships of a spouse, serious illness, and frustrated teenage romance as specified cases.<sup>9</sup> Mental turmoil and a range of socially and culturally distinctive family problems, typically involving spouses, in-laws, parent-child conflicts and unfulfilled expectations at work or failure in school played an important role.<sup>9</sup> Our results also suggest that domestic and social issues were by far the most common reason for DSH accounting to 70% of the cases. While prior psychiatric history was the reason for DSH in only 10% of the cases.

The World Health Organization estimates that for every suicide, there are at least 10-20 DSH acts.<sup>14</sup> A 7-year (1995-2001) review of all autopsies for suicide in Karachi gave an average of 198.5 suicides per year.<sup>15</sup> By this estimate there should be at least 2000 to 4000 cases of DSH in Karachi annually. Previous studies of DSH in in-patient

hospital population showed that most patients were young, under the age of 30 years with more females than males.<sup>16,17</sup> Self poisoning with medications was the most common method and benzodiazepines the most frequently used drug.<sup>18</sup> Interpersonal relationship problems were the most common reason stated, and adjustment disorders with depressed mood the most common diagnosis.<sup>18</sup> Effective management - both medical and psychological has a major impact in preventing the repetition of the act as well as fatal suicides.

Our study elucidated similar results with majority of patients committing DSH being in the young age group and females. Housewives and students were at the greatest risk of DSH especially those with underlying depression. Domestic and social issues were rated highest among these individuals with benzodiazepines used more commonly. Most of our patients refused inpatient psychiatric treatment leading us to believe that general awareness of psychiatric illnesses is imperative in our community. Psychiatric illnesses are quite prevalent in our society. There are multiple reasons for it including low socioeconomic conditions, poverty, lack of proper education system, lack of resources, dishonest leaderships, social injustice, corruption, discrimination, unemployment etc. Psychiatric illnesses are still considered as taboos. People laugh, pity or throw stones at mentally disturbed individuals. We are yet to identify these disorders as real with chemical imbalances. The burden of these problems is accumulating everyday. We need to arrange regular Continued Medical Education (CME) activities for physicians, mental health awareness programs for general public using appropriate media, form support groups, modify curriculum at medical school level, and inculcate research environment through national mental health policies.

The number of accidental overdose cases is alarming for us to consider modifying our existing pharmacy system. Our results are showing single males of relatively older age to be affected more. The cost of management is adding to the burden of disease. We need modifications at all levels. Patient counseling is absolutely necessary. Our patients need to be educated about the exact dose, timings, drug-drug interactions, food-drug interactions, adverse effects and reasons for prescribing medications. This should be stressed at all doctor visits. Pharmacists need to be trained to educate the patients and reemphasize at their level.

Medications should be labeled in the language patients understand. Availability of medications over the counter is a common practice in our country. Pharmacies are not licensed and a majority of them not run by trained, qualified pharmacists. Health care policies need to be revised and strictly implemented.

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