Self-poisoning: current trends and practice in a UK teaching hospital

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ABSTRACT – The epidemiology of deliberate self-poisoning presentations to the emergency department (ED) of Ninewells Hospital was reviewed over a six-month period. The results were related to previously published Scottish data. During the six month period, 530 patients presented (2.1% of total). There was a female preponderance with over 65% of patients aged less than 40 years. Patients lived more commonly in areas of higher deprivation. The drugs most commonly involved were paracetamol (39.25%) and antidepressants (35.1%). Of the presentatons 80.2% required no treatment apart from basic observations. Only 1.51% received activated charcoal and no gastric lavages were performed. Of the presentations, 75.6% were discharged after observation in the ED, 8.9% were admitted to a psychiatric hospital and 5.5% were admitted to general medicine department. Deliberate self-poisoning continues to be a major cause of hospital admissions in Scotland. In Tayside, it is predominantly a problem of the young and socially deprived. Consistent with recent national trends, paracetamol was the most common drug relating to overdose. The use of an ED observation ward is supported as a vast majority of patients are admitted for less than 24 hours and require no active treatment.

KEY WORDS: deprivation, overdose, parasuicide, self-poisoning, toxicology

Introduction

Deliberate self-poisoning remains a common presentation to emergency departments (EDs) in Scotland. After a decline in the rate of presentations throughout the 1980s, frequency of cases began to increase again in the 1990s, especially among young men.[1,2] In 2002, the Scottish Executive identified the prevention of suicide as an urgent public health issue and aimed to reduce the numbers in Scotland by 20% by 2013.[3] There were 13,268 presentations of deliberate self-poisoning to Scottish hospitals during the year ending March 2004, accounting for 1.11% of total admissions and 2.84% of emergency admissions.[4] This continues to represent a significant workload for Scottish EDs. Throughout the 1980s and early 1990s it was shown that paracetamol and benzodiazepines were the most common drugs used in self-poisoning presentations in Scotland.[1,5] This has resulted in legislation limiting the size of packs for over-the-counter analgesics, and changes in prescribing practices for benzodiazepines. Treatment strategies have also changed significantly over the past 20 years. Despite access to the National Poisons Information Service's database, TOXBASE, significant variation has been demonstrated in the treatment of deliberate self-poisoning in different departments across Scotland.[6]

The aim of this study was to review the epidemiology and treatment of presentations to the ED of Ninewells Hospital and relate this to previously established patterns in Scotland.

Methods

A prospective survey was conducted of deliberate self-poisoning patients presenting to the ED at Ninewells Hospital over a six-month period between April and September 2004. The department sees approximately 50,000 new patients a year and those requiring observation after deliberate self-poisoning are admitted to an eight-bed short-stay ward (SSW) within the department. Upon admission to this ward, information regarding the nature of presentation, any treatments given and the discharge destination of the patient are recorded in a computer database. Details of patients admitted to the SSW are also recorded in a written logbook.

Patients were excluded from the study if their overdose was not associated with intent to self-harm. While accepting that the use of recreational drugs may be associated with psychological disturbance, the study aimed to review the epidemiology of deliberate self-poisoning and therefore accidental overdoses of recreational drugs or prescribed medication were excluded. Overdoses of recreational drugs with the intent of self-harm were included. Patients who did not medically require a period of observation and were either discharged or admitted to a psychiatric hospital were included.

Data were collected from the database on standardised abstraction forms using Microsoft Excel. In

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most cases, the data needed were available from the database, when necessary the written medical records of these patients were examined for further information. The written log from the SSW was compared with the electronic database to ensure no patients were missed. Data collection included age, gender, drug and class of drug ingested, whether the drug was taken alone or in combination, any history of previous overdoses, treatment required, length of stay and the patient's outcome. Patient outcome was subdivided into discharged from the ED, admitted to the SSW, admitted to a general medical ward, admitted to the intensive care unit (ICU), admitted to a psychiatric hospital, discharged against advice and patients who died. Combination preparations such as, for example, co-dydramol were classified as taken in combination for all the active ingredients.

A measure of the patients' socio-economic status was derived from the postcode using the Carstairs scores for Scottish postcode sectors from the 2001 census.[7]

Results

There were 530 presentations with deliberate self-poisoning during the six-month period. This represented 2.1% of all ED presentations for the study period. The male to female ratio was 1.0:1.6. The age range of patients was 13–85 years with a median age of 33 years. Of the 530 patients, 66% were aged less than 40 years. The age and gender distribution is shown in Fig 1. One hundred and sixty-three patients (30.8%) had a previous history of deliberate self poisoning. Table 1 shows the different drugs used in the presentations. Of the total presentations, 311 (58.7%) involved the ingestion of a single drug, 139 (26.3%) ingested two drugs at once, 53 (10%) ingested three drugs and 27 (5%) ingested four or more drugs in combination. Paracetamol was the single drug most commonly used in overdose, being involved in 208 (39.25%) presentations. All patients claiming paracetamol overdose had blood sampling performed for paracetamol levels. Of this group, 123 (23.2%) had paracetamol detected biochemically. Other drug classes commonly used in deliberate self-poisonings were antidepressants (35.1% of presentations), hypnotics/anxiolytics (24.5%) and opioids (15.7%). Selective serotonin reuptake inhibitors (SSRIs) were the most common antidepressants taken in overdose accounting for 18.3% of total presentations and 52.2% of presentations involving antidepressants. Anti-psychotic drugs were involved in 7.9% of presentations and in over one third of these newer atypical anti-psychotic medication was used.

Table 2 outlines the range of social deprivation scores of patients. Patients presenting with deliberate self-poisoning lived more commonly in areas with high deprivation scores according to the Carstairs index 2001 (median deprivation score 5).[7] Of the patients, 54.3% lived in the most deprived areas (deprivation category 5–7) although this category comprises only 32.7% of housing in Tayside and 25.2% of housing in neighbouring Fife.

In total, 401 patients (75.7%) were discharged from the ED. Seventy-four patients (14%) did not require observation or treatment and were discharged after mental state assessment.

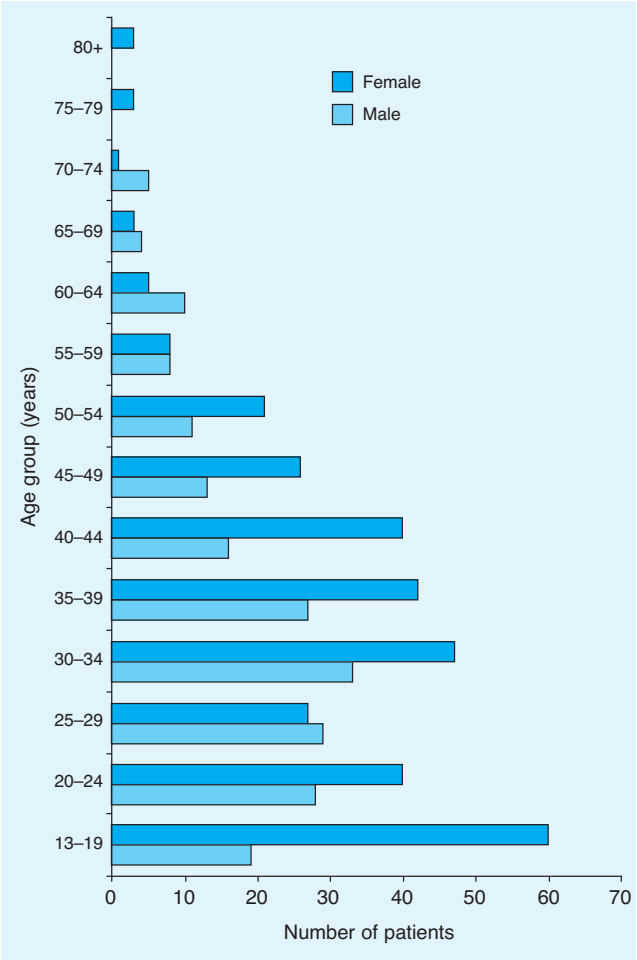

Fig 1. Age and gender of deliberate self-poisoning patients presenting to Ninewells Hospital emergency department.

The majority (327, 61.70%) were admitted to the SSW for a period of observation and, if required, treatment. Of the patients admitted to the SSW, 9.5% received N-acetylcysteine (NAC) – this accounted for 19.2% of patients claiming to have taken paracetamol-based compounds in overdose and 32.5% of those patients with paracetamol detected on blood sampling. Of those admitted, 9.2% required intravenous fluid therapy and 1.5% received activated charcoal. No gastric lavages were performed. Twenty-nine patients (5.5%) were admitted to general medicine and nine (1.5%) to the ICU. Six of the patients ultimately admitted to general medicine and one of the patients requiring intensive care were initially admitted to the SSW and transferred after deteriorating. Forty-three patients (8.1%) discharged themselves against medical advice from the ED. Of the patients observed in the SSW, the mean duration of admission was 15.5 hours. Forty-seven patients (8.9%) were ultimately admitted to a psychiatric hospital. Two patients died as a result of their overdose, the drugs responsible were cocaine and amitriptyline both in isolation. Both deaths occurred as a result of recognised complications of overdose of the drugs involved, and unfortunately did not respond to prompt and appropriate treatment.

Table 1. Drugs used in deliberate self-poisoning presentations to Ninewells Hospital emergency department.

Drug	Taken alone	Taken in combination	Total	Percentage of cases (%)
Paracetamol	98	110	208	39.25
Antidepressant (total):	75	111	186	35.1
SSRIs	35	62	97	18.3
TCAs	13	30	43	8.7
Venlafaxine and others**	13	30	43	8.1
Benzodiazepines	49	81	130	24.5
Opiates	16	67	83	15.7
NSAIDs	9	38	47	8.9
Anti-psychotics:	13	29	42	7.9
Atypical antipsychotics*	5	10	15	2.8
Anticonvulsants	7	12	19	3.6
Aspirin	5	13	18	3.4
Recreational	4	9	13	3.2
Antihypertensive/ cardiac	1	14	15	2.8
Hypoglycaemic agents	1	4	5	1.2
Other**	9	61	70	13.2
Unknown	25	6	31	5.9

NSAIDs = nonsteroidal antiinflammatory drugs; SSRIs = selective serotonin reuptake inhibitors; TCAs = tricyclic antidepressants.
*Clozapine, olanzepine, quetiapine, risperidone; **Including antihistamines, bronchodilators, hormone treatment, antimigraine agents, vitamins, PPI/H2 antagonists, drugs used in alcohol abuse, ritalin, antiemetics and antibiotics.

Table 2. Deprivation scores of patients presenting with deliberate self-poisoning. Deprivation category score: 1 = most affluent, 7 = most deprived.

Deprivation category score	Patients (%)	Distribution of housing (%)	
		Tayside	Fife
1–2	53 (10)	28.7	17.2
3–4	189 (35.7)	38.6	57.6
5–7	288 (54.3)	32.7	25.2

Discussion

Deliberate self-poisoning is a common presentation to the ED. In Tayside it is a problem primarily of the young, it occurs more frequently in females than in males and is more common in patients living in areas of social deprivation. The female preponderance is more pronounced in the two age brackets of 13–24 and 30–54. In other ages the sex ratio is essentially equal.

The link between suicide and socio-economic deprivation in Scotland has previously been described.[8,9] Elsewhere in the UK a strong ecological association between suicide and parasuicide has also been demonstrated, with socio-economic deprivation being a major contributing factor.[10] The results of this study show that a majority of deliberate self-poisoning cases come from deprived areas, in excess of the expected results due to population distribution. This supports calls for areas of social deprivation to be 'priority risk groups' for suicide and parasuicide prevention. The high percentage of patients with a previous history of deliberate self-poisoning (30.8%) also suggests a failure to address underlying psychiatric and/or social issues.

Rates of self-poisoning with paracetamol rose steadily in Scotland throughout the 1980s and 1990s.[1,11,12] Strategies, such as legislation to limit the size of packs of analgesics sold over-the-counter, have been introduced in an attempt to address this trend. This has been beneficial in reducing paracetamol-related suicide deaths and need for liver transplant across the UK.[13] However, paracetamol overdose clearly remains a significant problem, with paracetamol being the most common drug used in overdose in this study. Of these patients 19% required active treatment with NAC. These patients represented three quarters of those admitted for longer than 24 hours in the SSW. This is a significant proportion of the burden on acute services posed by deliberate self-poisoning presentations.

The use of antidepressants in overdose in Scotland has changed dramatically over the past 20 years. Willox reported in his review of self-poisoning patients presenting to the Victoria Infirmary, Glasgow, in 1985 that only 10% had used an antidepressant drug.[5] Trends in larger epidemiological studies demonstrate an increase in antidepressant use in overdose in Scotland over the last 20 years.[1,11] In this study antidepressants represented the second most common class of drug used in overdose (35.1% of presentations). SSRIs accounted for over half of these presentations (18.3%). Considering that a link between SSRIs and deliberate self-harm has been postulated,[14] the large increase in patients using antidepressant medications in deliberate self-poisoning since SSRIs became available is interesting. In contrast to this increase, the use of benzodiazepines and other hypnotics is falling. Of patients presenting to the Victoria Infirmary, 56% had used an anxiolytic-type drug.[5] A downward trend was identified between 1983 and 1993 with the rates of use of hypnotic and sedative drugs in deliberate self-poisoning being one of only two drug types to fall. This trend may have resulted from attempts over the period to reduce both long-term and overall prescription rates.[1] In this study, benzodiazepines and other hypnotics represented 24.5% of presentations. It could be suggested that SSRIs are replacing hypnotics and anxiolytics as the prescription drug of choice for deliberate self-poisoning in Scotland and a similar review of prescription practices is required.

In contrast the use of anti-psychotics in overdose is relatively uncommon featuring in only 8.6% of presentations. However, nearly one third of these cases involved the use of newer atypical anti-psychotics. This emphasises the need for emergency physicians to keep up to date with changing psychiatric prescribing practices and to be familiar with the pharmacology and toxicology of newer agents.

As in previous studies, patient history is often the only source of information as to which drugs were involved in the overdose. In some cases witness accounts, the presence of empty packaging and clinical correlation with typical toxidromes can lead to a greater degree of certainty. The reliance upon patient history, however, which can be inaccurate, must be taken into account when considering trends in the drugs used in overdose.

There has been long-standing concern regarding the strain on acute bed resources caused by deliberate self-poisoning presentations. After a large increase in admissions through the 1960s and 1970s, Jones predicted that by 1984 deliberate self-poisoning patients would fill all available emergency medical beds.[15] This obviously did not eventuate, however, self-poisoning represents a significant workload for both emergency and general medicine departments across the UK. Previously these patients were admitted to general medical wards and 'practically all patients were seen by a consultant physician'.[5] This study demonstrates the effective use of an ED SSW for the observation of these patients. Given a vast majority of patients required no active treatment (76.5%) and were admitted for a period less than 24 hours (83.5%) this appears to be a sensible approach. It also relieves a burden on acute medical beds at a time when 'access block' is an increasing problem across the country. Only 5.5% of patients required admission to the acute medical receiving unit and 1.7% to the ICU. This resulted from complicated pre-existing medical conditions confounding the clinical picture of their presentation, complications such as aspiration and recurrent seizure activity, or the need for advanced airway support initiated in emergency.

The use of the SSW for observation of self-poisoning patients relies on a close relationship with local liaison psychiatry services. Early, efficient and reliable psychiatric assessment is provided by a team of liaison psychiatry nurses led by a clinical nurse specialist who attend the SSW each morning. All patients admitted after self-poisoning are assessed prior to discharge. The on-call liaison nurse is also available during the day for assessment of those patients not requiring a period of medical observation. This enables prompt assessment and discharge of patients when medically fit, with appropriate community follow-up arranged, and early identification of those requiring inpatient psychiatric treatment. After hours the on-call psychiatry service or a senior doctor in the ED performs mental state assessment.

The treatment of self-poisoning is based on a combination of supportive management, specific antidotal therapy and gastrointestinal decontamination. As highlighted above, a majority of patients in this study required supportive therapy only. Treatment strategies have changed dramatically in Scotland over the past 20 years especially regarding gastric decontamination. In 1985, 78% of patients presenting to the Victoria Infirmary with self-poisoning underwent gastric lavage. McGuffie *et al* identified a lack of consensus in the management of acute overdose across Scottish ED departments in 2000 and called for a national standardisation of care.[6] In that study, 52% of surveyed departments would lavage a significant paracetamol overdose and 58% would lavage a tricyclic overdose beyond one hour after ingestion. Activated charcoal was regularly administered by 76% of departments with a median time limit of eight hours and in 19% of departments ipecacuhana was still in use. Gastric decontamination of patients in our study was carried out in strict accordance with published TOXBASE guidelines. The use of activated charcoal was considered only in patients presenting within one hour of ingestion without any airway compromise. Use of these guidelines led to only 1.5% of patients receiving activated charcoal and no gastric lavages were performed. The low morbidity and mortality rate of patients during the study demonstrates that more aggressive approaches to gastric decontamination are unnecessary.

In summary, deliberate self-poisoning across the Tayside area is a problem mainly of the young and social deprived with a gender ratio favouring females. The ongoing frequency of the use of paracetamol and the apparent increase in the use of antidepressants, such as SSRIs, are causes for concern. A treatment strategy based upon the use of an ED observation ward and TOXBASE guidelines has led to relatively short admission periods and low morbidity and mortality rates.

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