Original articles

General hospital services for deliberate self-poisoning: an expensive road to nowhere?

Navneet Kapur, Allan House, Francis Creed, Eleanor Feldman, Trevor Friedman, Elspeth Guthrie

Summary

This study was designed to investigate the clinical and economic aspects of deliberate self-poisoning services in four teaching hospitals in Leeds, Leicester, Manchester and Nottingham. We investigated the management of the current self-harm episode, including direct in-hospital costs, in 456 individuals who presented to hospital on a total of 477 occasions with deliberate self-poisoning during a 4-week period in 1996. Fewer than half of the patients received specialist psychosocial assessment or follow-up. Patients were more likely to receive an assessment if they were already in contact with psychiatric services, had a history of previous overdoses, if they presented during working hours, or if they lived near the hospital. Patients who were admitted were nearly twice as likely to receive specialist assessment, and those who received a specialist assessment were nearly three times as likely to be offered follow-up. In-patient days and days on the intensive care unit accounted for 47% and 8% of the total costs, respectively. This study suggests that general hospital services are disorganised, with evidence of inequitable access to specialist assessment and aftercare. This state of affairs cannot be justified on financial or clinical grounds.

Keywords: self-poisoning; service provision

Deliberate self-poisoning is one of the commonest reasons for general hospital admission in the UK,¹ and it represents a considerable economic burden.² Self-poisoning has potentially serious consequences: follow-up studies have found between 3% and 10% of self-harm patients eventually kill themselves.^{3,4} Unfortunately, services for this important problem have generally been badly planned and incoherently delivered.⁵ In an effort to improve this situation, the Royal College of Psychiatrists produced a consensus statement which set standards for service provision.⁶ This document emphasized the importance of adequate psychosocial assessment and prompt treatment and aftercare. However, recent studies have revealed wide variations in deliberate self-harm services against a background of general underprovision.^{7,8} In some centres, fewer than a quarter of those presenting with self-

poisoning are admitted to a medical bed and less than a third of patients receive a specialist psychosocial assessment or follow-up.⁹

We wished to explore further the nature of current service provision for the self-harm population. In four centres, we compared self-poisoning patients admitted to a medical bed with those discharged from the accident and emergency department, with respect to patient characteristics and the subsequent management of the self-poisoning episode. We also compared patients who received a psychosocial assessment during the current hospital contact, with those who did not. In addition, the direct general hospital costs of deliberate self-poisoning were estimated in order to investigate the economic aspects of different patterns of service provision.

Methods

The study was carried out in four teaching hospitals. Leeds General Infirmary and Manchester Royal Infirmary are inner city hospitals serving populations of approximately 400 000 and 200 000, respectively. Leicester Royal Infirmary serves 700 000 people, including a substantial rural population. The University Hospital in Nottingham has a predominantly urban catchment population of 800 000. The hospitals had deliberate-self harm services which reflected the range of current practice in the UK: in Leeds the service was provided by three junior doctors in liaison psychiatry. A nurse-specialist based service operated in Leicester, while social workers and junior psychiatrists undertook self-harm assessments in Nottingham. In Manchester, junior psychiatrists provided the self-harm service on a rota basis. In all centres, out of hours assessments were carried out by the junior psychiatrist on call.

We included in the study all patients over 16 years of age who attended the hospitals with deliberate self-poisoning, defined as the deliberate ingestion of substances intended to cause harm,¹⁰ over a 4-week period (18 November to 16 December 1996). We decided not to include cases of deliberate self-injury as it is difficult to identify, often being coded as 'laceration' in accident and emergency and hospital information systems.

Demographic details of attenders were collected along with details of drug or alcohol dependence, previous episodes of self-poisoning and current contact with psychiatric

Department of
Psychiatry and
Behavioural Sciences,
Rawnsley Building,
Manchester Royal
Infirmary, Oxford
Road, Manchester
M13 9WL, UK
N Kapur
F Creed
E Guthrie

Department of Liaison
Psychiatry, Leeds
General Infirmary,
Great George Street,
Leeds LS1 3EX, UK
A House

Department of
Psychological
Medicine, John
Radcliffe Hospital,
Oxford OX3 9DU, UK
E Feldman

Leicester General
Hospital, Gwendolen
Road, Leicester
LE5 4PW, UK
T Friedman

Accepted 3 June 1999

services. We also recorded information regarding the management of the current episode of self-poisoning, such as where individuals were seen, who saw them, the immediate outcome and the nature of any follow-up organised. Where possible, we made use of existing ward and accident and emergency (A&E) based information systems, such as referral ledgers and computerised databases. This information was supplemented by examining A&E notes of all those discharged directly from the A&E department. Copies of specialist deliberate self-poisoning assessments were also examined. All in-patient data were retrospectively checked against admission and discharge information for deliberate self-poisoning (ICD codes X60-X69), obtained from the Patient Administration System in each hospital.

The direct costs of deliberate self-poisoning within the general hospital were estimated using the methods described by Yeo.² We obtained data on the number of A&E attendances with self-poisoning, and the number of medical in-patient days for each episode. The number of specialist psychosocial assessments for each episode was also recorded. We also searched Intensive Care Unit records for

self-poisoning cases admitted during the study period. Costs were then estimated using prices quoted at self-cost without profit margin by the contracting department in each centre. These figures included capital charges, general services, staff and equipment costs. No costs were available for referral of a hospital in-patient for specialist psychosocial assessment and so the cost of a psychiatric out-patient appointment was taken as an approximation.

Results

During the 4 weeks of the study, there were 477 hospital attendances for deliberate self-poisoning, involving 458 patients in the four centres; 223 patients (49%) were female. The mean age of the sample was 30.9 years (standard deviation 11.8, range 16–87 years). In total, 187 patients (41%) had ingested paracetamol. A small majority (57%) resulted in admission to a medical bed and in 255 instances (53%), patients received a specialist psychosocial assessment at some time during their hospital attendance.

Table 1 compares the patient characteristics and subsequent management of those admitted to hospital with those discharged directly from the A&E department. Compared to patients discharged from A&E, those admitted to a medical bed were older (mean (SD): 32 (12.6) *vs* 29 (10.5) years, 95% confidence interval (CI) for difference 1–5). They were more likely to have taken a previous overdose and ingested antidepressants, and less likely to live outside the hospital catchment area, to have taken paracetamol, or to have presented to hospital between 23.00 h and 06.00 h. Those admitted were much more likely to receive a specialist psychosocial assessment during the hospital attendance.

Table 2 compares those who received a psychosocial assessment with those who did not. There was no significant difference in age (mean (SD): 31 (12.7) *vs* 30 (10.8), 95% CI –1 to 3). Those who received a specialist psychosocial assessment were more likely to have a history of previous overdose and to be in contact with psychiatric services. They were less likely to live outside the hospital catchment area and to present to hospital between 23.00 h and 06.00 h than those who did not receive an assessment. Subsequently, those who received a specialist assessment were more likely to receive active follow-up such as admission to a psychiatric bed or referral to psychiatric services.

The direct general hospital costs are shown in the figure. The total cost of deliberate self-poisoning in the four centres during the study period was £131 285. In-patient medical days accounted for 47% and days on the intensive care unit for 8% of the total costs.

Discussion

This study presents a comprehensive picture of deliberate self-poisoning in four centres during a 4-week period in 1996. Audit information suggested that our sample was representative of

Table 1 Comparison of patient characteristics and outcome of self-poisoning episodes leading to hospital admission with those episodes leading to direct discharge from the A&E department. All figures are percentages unless otherwise stated. The difference in proportion is given for all variables along with 95% confidence intervals (CIs)

Variable	Patient admitted to ward (n=274) (%)	Patient discharged from A&E (n=203) (%)	Difference in proportion (95% CI) (%)
Patient characteristics			
Previous overdose	46	34	12* (4 to 20)
Overdose of antidepressants	15	9	6* (0.5 to 10.5)
Current contact	25	21	4 (–4 to 12)
Alcohol dependence	12	8	4 (–1 to 9)
Drug dependence	4	3	1 (–2 to 4)
Female sex	47	52	–5 (–12 to 2)
Live outside catchment area	9	18	–9* (–15 to –3)
Overdose of paracetamol	25	45	–20* (–27 to –13)
Presented between 23.00 and 06.00	24	64	–41* (–49 to –33)
Outcome			
No specialist follow-up	46	67	–21* (–33 to –9)
No psychosocial assessment	35	63	–28* (–37 to –19)

*significant at $p < 0.05$ level

Table 2 Comparison of patient characteristics and outcome for self-poisoning episodes leading to psychosocial assessment with those episodes that did not. All figures are percentages unless otherwise stated. The difference in proportion is given for all variables along with 95% confidence intervals (CIs)

Variable	Psychosocial assessment (n=255) (%)	No psychosocial assessment (n=222) (%)	Difference in proportion (95% CI) (%)
Patient characteristics			
Previous overdose	49	32	17* (8 to 26)
Current psychiatric contact	29	16.7	12* (4 to 20)
Alcohol dependent	12.5	8.6	4 (–2 to 10)
Drug dependent	4.7	2.7	2 (–2 to 6)
Female sex	48.6	49.5	–1 (–10 to 8)
Overdose of paracetamol	28.6	29.7	–1 (–9 to 7)
Overdose of antidepressants	12.2	13.1	–1 (–7 to 5)
Live outside catchment area	6	22	–16* (–22 to –10)
Presented between 23.00 and 06.00	31	52	–21* (–30 to –12)
Outcome			
Admitted to psychiatric bed	16.5	2.7	14* (8 to 20)
Self-discharged	2.4	22.5	–20* (–25 to –15)
No specialist follow-up	29	83.8	–55* (–60 to –50)

*significant at $p < 0.05$ level

Figure Direct costs of deliberate self-poisoning. The total cost and cost per episode are shown for each hospital. All costs are in pounds sterling based on the number of A&E assessments, in-patient days, days on the Intensive Care Unit (ICU days) and specialist assessments at November 1996 prices

self-poisoning patients presenting to the study hospitals at other times. Since we restricted ourselves to teaching centres, our findings may not be generalisable to district general hospitals.

The average incidence of self-poisoning presenting to hospitals in this study was 310 per 100 000 per year. This is consistent with the usually quoted annual national rates of between 250 and 300 per 100 000.¹¹ Based on our data, deliberate self-poisoning accounts for 170 000 general hospital attendances in the UK each year. It is a major cause of medical admission, accounting for more than 130 000 in-patient days annually and costs in the order of 47 million pounds.

Despite the scale of the problem, there is a widespread under-provision of services for deliberate self-harm. Nearly half (43%) of overdose patients presenting to hospital in the current study were not admitted, and 47% of patients received no specialist psychosocial assessment during their hospital contact. Patients discharged directly from the A&E department were less likely to receive a specialist assessment, and in turn, those who did not receive a specialist assessment were less likely to be offered aftercare.

The situation is not much better than that reported in an audit of 10 psychiatric teams in a Nottingham hospital two decades ago.¹² This unsatisfactory state of affairs may reflect a failure to resolve conflicting clinical and financial demands. For example, patients were much less likely to be admitted if they presented at inconvenient hours or if they lived outside the hospital catchment area, suggesting administrative rather than solely clinical pressures on decision making. This situation is replicated nationally,^{7, 8} because self-harm within the general hospital is not given priority by service providers. Limited resources mean that many Mental Health Trusts are unable to respond

quickly to the complex psychosocial needs of the majority of patients who poison themselves.

Organisational and clinical pressures to cut services are compounded by a general perception by physicians and psychiatrists that interventions following deliberate self-poisoning are ineffective.¹³ However, a recent *Effective Health Care Bulletin*¹⁴ concluded that, despite the small size of existing studies, there was evidence to suggest that interventions could have significant beneficial effects on mood, social functioning and repetition rates. Although some clinicians may argue that filling precious beds with these patients is largely a waste of time, there is evidence to suggest that a brief medical admission does have a positive effect on longer term outcome¹⁵ and also improves access to services. In this study, for example, patients who were admitted were much more likely to get appropriate assessment and follow-up.

In the face of these pressures, the current approach to the hospital management of deliberate self-harm is generally based on a high-risk strategy – interventions are targeted to a minority of individuals believed to be at risk of further self-harm. For example, our results show that patients were more likely to be admitted to hospital if they were older, had taken a previous overdose, or ingested antidepressants, but not if they had taken paracetamol below the level needing specific treatment. This might be seen simply as a sensible way to husband scarce resources, but there are convincing arguments to suggest that high-risk strategies only have a limited impact on morbidity and repetition rates following deliberate self-harm.¹⁶ For example, those identified as being at ‘high risk’ using the best available risk-assessment scale,¹⁷ account for only 26% of cases of future suicidal behaviour, the much larger ‘low-risk’ group accounting for the remainder. With intervention restricted to the high-risk group, even assuming that it is totally effective (which is improbable), we will reduce the overall rate of suicidal behaviour by at most one quarter.

Economic considerations may also be playing a part. It is expensive to provide psychosocial assessments and even more so to admit overdose patients to medical beds. For example, in Manchester, where one-third of patients are admitted and fewer than 40% receive psychosocial assessments, the average hospital cost per episode was £217. By contrast in Leeds, where the majority of patients are admitted and two-thirds receive a specialist assessment, the average cost per episode was £432. There are therefore short-term financial disincentives to providing comprehensive self-harm services in general hospitals. However, the financial cost of providing a comprehensive service is small compared to the total cost of general hospital services.² Providing comprehensive and planned services is probably cheaper than providing partial and disorganised services,¹⁸ and is necessary on public health grounds because of the scale of the problem.

There are many potential difficulties in providing good-quality services for self-harm patients. They are a difficult group to help, with significant numbers discharging themselves from hospital or refusing any help that is offered.¹⁴ Large numbers of patients present with overdoses of apparently low lethality, and in smaller district general hospitals with geographically dispersed community mental health teams, 24-hour psychiatry cover in A&E may not be a realistic option. Nevertheless, we would argue that the current management of

deliberate self-poisoning is an expensive road to nowhere. More research and a radical overhaul of services is needed to improve the efficacy and cost-effectiveness of the general hospital management of patients who have poisoned themselves.

This study was funded by a Medical Research Council grant. We would like express our gratitude to hospital staff at all four centres for their assistance with data collection. We would also like to thank Dr David Owens and two anonymous referees for their comments on earlier drafts of this paper. At the time of this study, NK was supported by the Medical Research Council and Leeds Community Mental Health Trust.

- 1 Hawton K, Fagg J. Trends in deliberate self-poisoning and self-injury in Oxford, 1976–1990. *BMJ* 1992;**304**:1409–11.
- 2 Yeo H. Cost of treatment of deliberate self harm. *Arch Emerg Med* 1993;**10**:8–14.
- 3 Hawton K, Fagg J. Suicide and other causes of death following attempted suicide. *Br J Psychiatry* 1988;**152**:359–66.
- 4 Nordentoft M, Breum L, Munck L, Nordestgaard A, Hunding A, Bjaedager P. High mortality by natural and unnatural causes: a 10 year follow up study of patients admitted to a poisoning treatment centre after suicide attempts. *BMJ* 1993;**306**:1637–41.
- 5 House A, Owens D, Storer D. Psycho-social intervention following attempted suicide: is there a case for better services? *Int Rev Psychiatry* 1992;**4**:15–22.
- 6 Royal College of Psychiatrists. *The general hospital management of adult deliberate self-harm: a consensus statement on standards for service provision*, Council Report Number 32. London: Royal College of Psychiatrists, 1994.
- 7 Hawton K, James R. General hospital services for attempted suicide patients: a survey in one Region. *Health Trends* 1995;**27**:18–21.
- 8 Hughes T, Hampshaw S, Renvoize E, Storer D. General hospital services for those who carry out deliberate self harm. *Psychiatr Bull* 1998;**22**:88–91.
- 9 Kapur N, House A, Creed F, Feldman E, Friedman T, Guthrie E. Management of deliberate self poisoning in adults in four teaching hospitals: descriptive study. *BMJ* 1998;**316**:831–2.
- 10 Kessel N. Self-poisoning - part 1. *BMJ* 1965;**2**:1265–70.
- 11 Platt S, Hawton K, Kreitman N, Foster J. Recent clinical and epidemiological trends in parasuicide in Edinburgh and Oxford: a tale of two cities. *Psychol Med* 1988;**18**:405–18.
- 12 Blake D, Mitchell J. Self-poisoning: management of patients in Nottingham, 1976. *BMJ* 1978;**I**:1032–5.
- 13 Brogan R, Ulyatt K, Pelosi A. Management of deliberate self poisoning (letter). *BMJ* 1998;**317**:415.
- 14 NHS Centre for Reviews and Dissemination. *Effective Health Care Bull* 1998;**4**(6):1–12.
- 15 Owens D, Dennis M, Jones S, Dove A, Dave S. Self-poisoning patients discharged from accident and emergency: risk factors and outcome. *J R Coll Physicians London* 1991;**25**:218–22.
- 16 Kapur N, House A. Against a high risk strategy in the prevention of suicide. *Psychiatr Bull* 1998;**22**:534–6.
- 17 Kreitman N, Foster J. Construction and selection of predictive scales, with special reference to parasuicide. *Br J Psychiatry* 1991;**159**:185–92.
- 18 Whyte IM, Dawson AH, Buckley NA, Carter G, Levey CM. Health care: a model for the management of self poisoning. *Med J Aust* 1997;**167**:142–6.