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Mortality after discharge from long-term psychiatric care in Scotland, 1977 – 94: a retrospective cohort study

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Abstract

Background: Recent United Kingdom strategies focus on preventable suicide deaths in former psychiatric in-patients, but natural causes of death, accidents and homicide may also be important. This study was intended to find the relative importance of natural and unnatural causes of death in people discharged from long-term psychiatric care in Scotland in 1977 – 1994.

Methods: People discharged alive from psychiatric hospitals in Scotland in 1977 – 94 after a stay of one year or longer were identified using routine hospital records. Computer record linkage was used to link hospital discharges to subsequent death records. Mortality was described using a person-years analysis, and compared to the general population rates.

Results: 6,776 people were discharged in the time period. 1,994 people (29%) died by the end of follow-up, 732 more deaths than expected. Deaths from suicide, homicide, accident and undetermined cause were increased, but accounted for only 197 of the excess deaths. Deaths from respiratory disease were four times higher than expected, and deaths from other causes, including cardiovascular disease, were also elevated.

Conclusion: Suicide is an important cause of preventable mortality, but natural causes account for more excess deaths. Prevention activities should not focus only on unnatural causes of death.

Background

Several countries have reported high rates of suicide in people discharged from long-term psychiatric care [1]. In the United Kingdom, suicide reduction strategies in both Scotland [2] and England [3] emphasise the importance of work to reduce deaths in people who have been in-patients in psychiatric hospitals.

Suicide is a high profile event in which there is considerable public interest. The risk of psychiatric patients being themselves victims of violence has received less public attention [4]. Other countries have reported higher rates of less visible causes of death in former long-stay patients, including cardiovascular and respiratory disease [5,6]. Poor diet and high rates of cigarette smoking have been found among some groups of psychiatric patients in

Scotland [7,8], but the population impact of these findings has not been investigated. We set out to identify the relative importance of suicide, homicide and other causes of death in people discharged from long-term psychiatric care in Scotland, using record linkage of NHS psychiatric hospital records and the death records of the Registrar General for Scotland.

Methods

Using the Scottish linked data set we identified people discharged from long-term hospital care in Scotland in the period 1977 – 94 who met Hassall et al's definition of a long stay patient [9], i.e. someone resident in a psychiatric hospital for a minimum of one year. Individuals with a primary diagnosis of learning disability or dementia, or those aged less than 15 years at time of discharge were excluded.

The linked data set holds all Scottish psychiatric discharges combined with the Registrar General's death records [10]. The file covered the years 1977 – 94 and contained over 2 million records, representing in excess of 900,000 individuals. Records for each individual are held together allowing follow-up of in-patient health care and subsequent mortality over a 17 year period. This data set was used to identify long stay patients, as defined above, discharged alive from Scottish Psychiatric Hospitals in 1977 – 94.

A person years analysis of mortality was carried out using the person years programme [11]. We compared deaths in the long stay cohort to those in the Scottish population for all causes; suicide (ICD 9 950 – 959); undetermined deaths (ICD 9 980 – 989); homicide (960 – 969); external causes (E800 – E949, E970 – E979, E990 – E994); infec-

tious and parasitic diseases (10 – 139); all neoplasms (140 – 239); endocrine (240 – 279); mental disorders (290 – 292); nervous system (320 – 326); circulatory system (390 – 459); respiratory system (460 – 519); digestive system (520 – 579) and genitourinary system (580 – 629). Deaths recorded as suicide and those recorded as undetermined were grouped together for further analyses. Expected numbers were calculated from general population rates adjusting for gender, age (5-year age bands), and calendar-specific discharge periods (5-year groups).

Results

The cohort

6,776 people met the criteria for entry into the cohort. The demographic and diagnostic characteristics of the group are shown in Table 1 by period of discharge. Schizophrenia was the commonest single diagnosis in each period. In all, there were 53,710 person years of follow-up. The commonest diagnoses included in the "Other" category were alcohol dependence, paranoid states and alcohol-related psychoses.

Deaths

1,994 of the cohort (29%) died during the follow up period, compared to 1262 deaths that would have been expected from general population rates, an excess of 732 deaths. The odds ratio for all cause mortality was 1.58 (CI 1.51 – 1.66). Table 2 shows deaths by cause. 232 deaths were accounted for by suicide, undetermined causes, homicide and accidents. Taking into account the number of deaths that would have been expected in these categories, 197 of the excess deaths were accounted for by these unnatural causes. The majority of the excess deaths had natural causes, particularly circulatory and respiratory disease.

Table 1: Demographic Characteristics of Patients by Discharge Cohort, Scotland 1977 – 94

| | Discharge Cohort | | | |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| | 1977 – 82 (n = 2773) | 1983 – 88 (n = 2119) | 1989 – 94 (n = 1884) | 1977 – 94 (n = 6776) |
| Gender (Percent Male) | 50% | 53.1% | 51.6% | 51.4% |
| Median Length of Current Admission in Weeks | 114 | 117 | 118 | 116 |
| Schizophrenia | 1030 | 938 | 831 | 2799 |
| Affective Disorder | 560 | 455 | 431 | 1446 |
| Neuroses | 192 | 129 | 124 | 445 |
| Personality Disorders | 287 | 135 | 65 | 487 |
| Other | 704 | 462 | 433 | 1599 |

Table 2: Deaths by Cause, Both Sexes, 1977 – 94

| | Observed | Expected | O/E Ratio | 95% C I |
|--|----------|----------|-----------|---------------|
| Infectious and Parasitic (01 – 139) | 11 | 5.37 | 2.05 | 1.02 – 3.67 |
| All Neoplasms (140 – 239) | 300 | 288.4 | 1.04 | 0.93 – 1.16 |
| Endocrine (240 – 279) | 18 | 11.34 | 1.59 | 0.94 – 2.51 |
| Mental disorders (290 – 319) | 63 | 18.31 | 3.44 | 2.69 – 4.40 |
| Nervous System (320 – 389) | 41 | 17.45 | 2.35 | 1.68 – 3.19 |
| Circulatory System (390 – 459) | 803 | 514 | 1.56 | 1.46 – 1.67 |
| Respiratory System (460 – 519) | 295 | 72.01 | 4.10 | 3.65 – 4.59 |
| Digestive system (520 – 579) | 73 | 38.51 | 1.90 | 1.51 – 2.38 |
| Genitourinary System (580 – 629) | 29 | 15.16 | 1.91 | 1.28 – 2.75 |
| Suicide (950 – 959) | 107 | 7.9 | 13.54 | 11.21 – 16.37 |
| Undetermined Cause (980 – 989) | 47 | 2.92 | 16.11 | 11.84 – 21.43 |
| Suicide and Undetermined Cause | 154 | 10.82 | 14.23 | 12.16 – 16.67 |
| Homicide (960 – 969) | 5 | 1.10 | 4.55 | 1.48 – 10.61 |
| External causes (800 – 949, 970 – 979, 990 – 994) | 73 | 22.09 | 3.30 | 2.63 – 4.16 |

Discussion

This paper provides the first information on deaths among people discharged from long-term psychiatric care in Scotland. Previous literature has either been from outside the United Kingdom, or relates to specific discharge programmes [12] or diagnoses [13]. This cohort was discharged as part of routine care, and therefore allows an insight into deaths among a general psychiatric population. The study followed the convention of dividing deaths into natural and unnatural [5]. In keeping with the work of Trieman et al [12] and Harris and Barraclough [5] all cause mortality was elevated, as were deaths from both natural and unnatural causes.

Death by suicide, and from undetermined cause, occurred more frequently than would have been expected in the general population. The elevated risk of suicide, around 13 times higher than expected, was higher than Harris and Barraclough's [1] meta-analysis result for discharged patients (SMR 693), but similar to their community care result (SMR 1280, CI 1111-1608). This may be related to our exclusion of anyone discharged with a length of stay under one year, hence increasing the proportion of people in the Scottish cohort who suffer from severe illness.

Homicide deaths were elevated, with five deaths occurring, compared to the one death that would have been expected. Hiroeh et al [4] reported similar findings from a Case Register based study in Denmark, with a six-fold elevation in homicide rates in people who had ever been admitted to a psychiatric hospital. They concluded that the public and the media, traditionally concerned with potential risk from mental health service users, should be aware of the vulnerability of service users to violence directed against them. Our findings suggest that these observations are as relevant in the UK as in Denmark.

Deaths from natural causes were also elevated in this Scottish cohort. Circulatory disorders accounted for the greatest number of deaths, and were around 50% higher than expected. Respiratory disease was responsible for the next greatest number of excess deaths, and was four times higher than expected. Harris and Barraclough [5] reported increased rates of circulatory and respiratory disease in their systematic review, when looking at psychiatric patients from all treatment settings. When looking at former in-patients, they were able to identify fewer studies, but found that death rates from infectious and respiratory disease were elevated. Sohlman and Lehtinen [6] reported elevated death rates from cardiovascular disease in a recent Finish ex-inpatient discharge cohort. The Scottish findings are in line with these previous findings, and allow Harris and Barraclough's findings on the general psychiatric population to be extended to those discharged from long-term care.

The reasons for these marked increases in non-violent forms of death are not clear. More disease may occur in this population, for example because of greater exposure to risk factors such as smoking, excess alcohol use or poor diet. Anti-psychotic drug use may also account for some cardiovascular deaths [14,15]. It is also possible that access to health care may be more limited for this group, or that they might be treated differently from people who have not had a mental illness. In relation to exposure to risk factors in Scotland, Kelly and McCreadie [16] have reported smoking rates in people with schizophrenia of twice that of the general population. They point out [8] that smoking disadvantages their patients financially as well as physically. Again in people with schizophrenia, Brown et al [13] concluded that cigarette smoking was likely to explain much of the excess risk in people in the

community. Poor diet and lack of exercise are also likely to be important [7,17].

Brown et al [13] concluded that improved recognition of disease, better treatment and improved compliance might have reduced the number of deaths in the cohort they described. There may, however, be barriers to people with mental illness accessing good quality care [18]. In the United States, Druss et al [19] reported that older people with mental illnesses did not always receive high quality care after a myocardial infarction. Schizophrenia and major affective disorders appeared initially to be associated with increased mortality after an infarct, but these differences disappeared after adjusting for indicators of quality of care. Similarly, in Western Australia there was little difference in cancer incidence rates in people on a mental health service register compared to the general population, but a substantial increase in mortality [20]. The authors attributed this finding to a higher case fatality rate, again raising the possibility of different treatment, or reduced compliance, in the group of people who had been in contact with mental health services.

Using record linkage to establish a large cohort allowed examination of other causes of death. This work is limited by the use of only routinely collected information. We had no opportunity to verify diagnoses in hospital, or of causes of death after discharge. There is a trade off between the ability to examine an entire national cohort and the loss of qualitative information [21]. The main routine data set used, the SMR4 (now the SMR04) has inaccuracies [22], although these have reduced in recent years. The information we used from the SMR4 scheme, apart from patient identifiers, was limited to admission and discharge dates and diagnosis and so there should be limited opportunities for biases to arise from the use of this dataset. Our method did not allow us to identify any deaths occurring outside Scotland, and it is therefore possible that the rates underestimate the risk of death. We did not examine differential death rates by diagnosis, and this should be explored in future research.

Conclusions

We conclude that death rates in people discharged from long-term psychiatric care in Scotland are substantially higher than would be expected from general population rates. Suicide remains an important cause of death in this group of people, as do accidents and violence. More potential deaths could be prevented by successfully reducing the number of deaths from physical ill-health, however, than from suicide reduction measures. Services should review the support offered to patients after discharge and consider pursuing health promotion measures aimed at reducing smoking and improving diet. Researchers should seek to identify any systematic differences in

the quality of care offered to people with mental health problems, compared to treatment accessed by the general population, and to examine differential death rates by diagnostic group. Higher death rates in people with mental health problems have been recognised in the UK for 160 years [23]. In the drive to reduce social inequalities, UK agencies need to target work at the health inequalities experienced by people who have used psychiatric services.

Competing interests

Cameron Stark is a Public Health Adviser to the National Schizophrenia Fellowship (Scotland)

Authors' contributions

Cameron Stark had the original idea for the study, contributed to the design and wrote the paper. Margaret MacLeod and Fiona O'Brien analysed the data. David Hall contributed to the design, advised on interpretation of results, and helped draft the paper. Anthony Pelosi contributed to the design and advised on interpretation of results. Fiona O'Brien died during the preparation of this paper.

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