Life expectancy at birth and all-cause mortality among people with personality disorder

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King's College London, King's Health Partners, Dept of Health Service and Population Research, Institute of Psychiatry, London, UK

Marcella Lei-Yee Fok, MRCPsych

Richard D Hayes, PhD

Chin-Kuo Chang, PhD

Robert Stewart, MD

Felicity J Callard, PhD

Paul Moran, MD

Corresponding author: Paul Moran, Institute of Psychiatry, Box PO28, De Crespigny Park, London, UK, SE5 8AF. Email: paul.moran@kcl.ac.uk Tel: 020 7848 0568 Fax: 020 7848 5056

ABSTRACT

Objective

It is well established that serious mental illness is associated with raised mortality, yet few studies have looked at the life expectancy of people with personality disorder (PD). This study aims to examine the life expectancy and relative mortality in people with PD within secondary mental health care.

Methods

We set out to examine this using a large psychiatric case register in southeast London, UK. Mortality was obtained through national mortality tracing procedures. In a cohort of patients with a primary diagnosis of PD (n=1836), standardized mortality ratios (SMRs) and life expectancies at birth were calculated, using general population mortality statistics as the comparator.

Results

Life expectancy at birth was 63.3 years for women and 59.1 years for men with PD - 18.7 years and 17.7 years shorter than females and males respectively in the general population in England and Wales. The SMR was 4.2 (95% CI: 3.03 – 5.64) overall; 5.0 (95% CI: 3.15 – 7.45) for females and 3.5 (95% CI: 2.17 – 5.47) for males. The highest SMRs were found in the younger age groups for both genders.

Conclusion

People with PD using mental health services have a substantially reduced life expectancy, highlighting the significant public health burden of the disorder.

Keywords: epidemiology; life expectancy; mental health services; mortality; personality disorders

INTRODUCTION

Mental disorder is an established risk factor for increased mortality [1, 2]. People with mental disorders die prematurely for a variety of reasons, including poor physical health [3-5], adverse physiological consequences of long term psychotropic medication, unhealthy lifestyle [5], as well as increased death rates as a result of suicide, accidents and homicide [6-8]. The risk of increased mortality has been shown to vary according to type of mental disorder, with substance use disorders conferring a particularly high risk of early death [1, 9, 10]. Personality disorder is a global health problem [11]. It is one of the hardest psychiatric conditions to treat and has a considerable economic impact on general medical and mental health services. People with personality disorder (PD) are known to be at particularly high risk of increased mortality as a result of both natural and unnatural causes [12-16]. However, no study has comprehensively examined life expectancy at birth of the full range of secondary care service users with PD. Life expectancy is a vital public health statistic which serves as a readily identifiable indicator of general mortality in a specified population followed up for a certain period of time.

METHOD

In the current study, we used a large psychiatric case register to conduct a retrospective cohort study, the purpose of which was to ascertain life expectancy at birth and age- and gender-standardised mortality of personality-disordered patients compared to the general England and Wales population. We also calculated standardised mortality ratios stratified by gender and age group, in order to investigate differences among subgroups.

Setting and Participants

Our sample was drawn from the electronic case register of the South London and Maudsley NHS Foundation Trust (SLAM), Europe's largest secondary mental health care provider serving an aggregate population of 1.2 million people living in four London boroughs (Lambeth, Southwark, Lewisham and Croydon). The SLAM Biomedical Research Centre (BRC) Case Register provides anonymised in-depth information derived from an electronic clinical record system. The development and protocol of this case register has been described in detail in a previous open access publication [17]. SLAM incorporates inpatient and outpatient care, and a broad array of community care teams, as well as psychiatric liaison services to general hospitals, and forensic, old age, child and adolescent, and learning disability mental health teams.

Electronic clinical records have been used comprehensively across all SLAM services since 2006 and the BRC Case Register Interactive Search (CRIS) system was developed in 2008 to allow searching and retrieval of anonymised information from full clinical records with over 182,000 cases currently represented on the system. CRIS was approved as a data resource for secondary analysis by the Oxfordshire Research Ethics Committee (reference 08/H0606/71).

All cases within the case register that had been given a primary PD diagnosis by International Classification of Diseases, 10th Edition (ICD-10) within the four-year period from 1 January 2007 to 31 December 2010, and were over 15 years of age, were recruited into the study as a cohort (n=1,836). All-cause mortality in patients with PD over this four-year period was used for analyses. The beginning of 2007 was chosen as a starting point for the observation because this corresponded to the most complete recording of clinical data on the Case Register.

Measures

Death identification

NHS number is a unique identifier for UK NHS records. All death certifications are linked to this identifier at national level, and health service providers are required by law to keep records up to date with respect to this. Every death in the UK, after the issuing of a formal death certificate, must be reported to the Office for National Statistics General Records Office and conveyed to the NHS Care Records Service, which holds these death notifications and makes them available to all NHS organisations. In accordance, on a weekly basis, SLAM downloads a list of deceased patients from the NHS Care Records Service and updates their dates of death onto the patients' records, whether that person is active to services or has been discharged. In the present study, deaths determined by a date of death within the 4-year period were enrolled for analyses.

Personality Disorder

This was based on the patient's primary ICD-10 diagnosis of PD (categories F60 and F61) dated from 1 January 2007 to 31 December 2010 in the Case Register.

Demographics

Date of birth, gender, ethnicity and marital status of all patients are routinely recorded on the Case Register. Age was calculated at the date of primary diagnosis of PD that occurred in the observation period. All those who were under the age of 15 at this date were excluded from the analyses.

Statistical analysis

Life expectancy at birth

Life expectancy at birth is an index derived from age-specific mortality that highlights the impact of mortality in younger age groups. A life table is constructed using the age-specific mortality of an observed population over a given period of time; life expectancy at birth is calculated from the accumulated total person-years contributed by the entire concurrent cohort divided by the size of the population at the beginning of follow up. We used Chiang's method of abridged life tables with five-year age bands to calculate life expectancy [18]. For each individual, the period of time from the date of PD diagnosis until death or the end of the observation period (whichever occurred first), was taken as the 'at-risk period'. In each 5-year age band, the total person-years at risk is the sum of all the at-risk periods of the individuals in the age band. The number of people who had a recorded death during this period was used as the numerator to calculate the annual mortality rate for the age band. In some instances, individuals moved from one age band to the next during the four-year observation period. In such cases, the specific time at risk contributed by those individuals to each age band was then assigned to the respective age bands. Given that those below the age of 15 years were excluded from our cohort, we filled in the three cells in the life table corresponding to death rates for 0-5 years, 5-10 years and 10-15 years of age with the respective comparative death rates for these age groups in the England and Wales general population in 2008 [19]. These tables were inserted into a Microsoft Excel spreadsheet and values for gender-specific life expectancy were calculated with 95% confidence intervals. These life expectancy estimates were compared with gender-specific life expectancy at birth for the England and Wales population in 2006-2008 [20], and the arithmetic differences between the two were then calculated.

Standardized mortality ratios

The estimation of all SMRs were carried out using Stata version 10 [21]. As with life expectancy, the at-risk period was defined as the period of time from the date of PD diagnosis in the observation period until date of death or the end of the observation period (whichever occurred first). SMRs were calculated for the four-year follow-up period, using the number of deaths observed in the cohort in these four years as the numerator. SMRs were gender- and age- standardized using five-year age bands (i.e., 15-19, 20-24, 25-29, …, 85-89, 90 or over). The denominator was derived by calculating the total person-years at risk in each age group of the sample, then multiplying this by the corresponding age- and gender -specific mortality rate in the England and Wales population [19]. The time period at risk contributed by individuals who moved from one age band to the next during the observation period, was assigned to the respective age bands.

RESULTS

A total of 1,836 cases formed the analysed cohort. The characteristics of the cases are displayed in Table 1. In summary, the majority were female (60%), 73% were white British and 74% were in the 15-44 years age group. Regarding marital status, 66% were single, 10% were either married, cohabiting or in a civil partnership, and 12% were divorced, separated or widowed.

[Table 1 here]

Estimates of life expectancy at birth of people with PD, stratified by gender, are displayed in Table 2 along with differences compared to general population estimates. Compared to the

England and Wales general population, the life expectancy of men and women with PD in this sample was lower by 17.7 and 18.7 years respectively.

Table 3 displays age- and gender-standardized SMRs for the entire cohort and then stratified by gender and age groups. The SMR for all patients with PD in this cohort was 4.2 (95% CI: 3.03 – 5.64) and the SMRs for male and female personality-disordered patients were of a similar magnitude. Stratification by age bands revealed that the youngest age group (15-44 years old) carried the highest excess mortality, compared to the general population, and that the youngest age group had higher excess mortality compared to the oldest age group.

[Tables 2 and 3 here]

DISCUSSION

Main Findings

Our study highlights the substantial public health burden of personality disorder in terms of elevated mortality, especially for younger age groups. We found that patients with personality disorder can expect, on average, considerably shortened lives compared to their counterparts in the general population, with men losing 17.7 years of life and women losing 18.7 years. Their mortality was four times that of the comparative general population. Furthermore, a 10-fold increased mortality risk was found for younger people with personality disorder. These findings critically underscore the vulnerable nature of people with PD and the urgent need for developing feasible strategies to prevent premature mortality in this group of patients.

A number of studies have previously found an association between PD and raised mortality [12-16]. However, to our knowledge, our study is the first to comprehensively examine the life expectancy of secondary care service users with PD. Only one other study has attempted to describe life expectancy for people with PD. Hannerz et al [22] used a Swedish nationwide hospital discharge registry to estimate life expectancies in different diagnostic groups for individuals treated as inpatients. Both men and women with personality disorder had a lower "expectation of remaining life" at all ages, compared to people with schizophrenia and affective psychosis as well as the general population. However, the restriction of that analysis to hospitalised patients and the use of ICD-8 diagnoses limit the application of the findings to present-day secondary care settings. Approximate estimates of life expectancy at birth can be calculated using SMRs from published studies [23]; however doing this from the few existing studies would only generate a very rough estimate for people with PD, and one which would be less accurate than the method used in our study. Our data contributes to the literature generally as well as providing UK specific data on life expectancy.

Strengths and Limitations

Our study has a number of strengths. We analysed a large sample of cases covering a broad age range. We included everyone with PD who had contact with services over a 4-year period, whether this was in the context of inpatient admission, community care or one-off emergency presentation. We therefore captured a wide range of patients with PD adding to the generalisability of our findings to other secondary care settings. The NHS setting with relatively comprehensive coverage provided to specific geographic catchments was also an advantageous setting regarding generalisability to other secondary care settings. In terms of diagnosis, although research diagnostic criteria may be preferable, our use of clinicians' case record ICD-10 diagnoses favours generalisability to real clinical practice. The mortality data

were derived from a robust source and under-ascertainment of deaths is likely to have been very low. Furthermore, any possible failures in the reporting of deaths would only have led to an underestimation of the detected associations.

The findings need to be considered in the light of certain limitations. First, standardized mortality ratios only provide a coarse picture of deaths in a specified study population without the consideration of confounders other than age and gender. Potentially important confounders which are unmeasured in this study include socio-economic status, comorbid psychiatric and physical conditions and substance misuse. Second, we were only able to report on all-cause mortality; against this, our aim was to clarify excess mortality and reduced life expectancy rather than investigate underlying causes of death. Third, our statistical power to examine associations between PD clusters and mortality was not sufficient to detect significant differences. Fourth, we used national data as a comparison, which might not be representative of the local population in southeast London. To address this, we carried out a sensitivity analysis, standardising with mortality statistics for London alone (data not shown); in the sensitivity analysis, the point estimates for SMRs were not substantially different compared to those displayed in Table 3. Fifth, the observed age-related decline in SMRs may be due to survival effects i.e., that people with PDs surviving to older age may have other protective factors conferring this survival. Finally, we acknowledge that a large number of people with PD do not present themselves to mental health services and are either managed in primary care or within general medical services. Our findings therefore only apply to secondary mental health service users.

Possible mechanisms

A number of mechanisms are likely to underlie the detected association between PD and reduced life expectancy. First, the rate of death from unnatural causes, including suicide and

homicide, is elevated in PD [6] and this is likely to have contributed to the reduced life expectancy detected in this study. Second, considering deaths due to natural causes, personality disorder is associated with poorer general health. For example, Borderline PD has been found to be associated with higher numbers of medical problems and one recent epidemiological study found that most PD groups were associated with cardiovascular disease [24]. More generally, mental disorders are linked to poor health through unhealthy lifestyle [25, 26], physical consequences of psychotropic medication [3], and problems accessing medical care [27]; some or all of these factors may account for reduced survival in people with PD. Substance use disorders are a major cause of death and disability [1, 9] and frequently co-occur with PD, particularly in young people with Cluster B PD [28], and the particularly high SMR for Cluster B PD may reflect unhealthy lifestyles characterised by heavy substance use and smoking. Patients with PD are often prescribed excessive doses of psychotropic and non-psychotropic medications [29] which themselves may potentially lead to unwanted physical consequences. Finally, people with PD often struggle to obtain adequate health care and have greater unmet treatment needs [30].

We conclude that people with PD have a significantly reduced life expectancy at birth compared to the general population. This fact alone highlights the importance of routinely assessing personality status in psychiatric patients. It also highlights the need for clinicians to pay greater attention to the physical health status and lifestyles of patients with PD, in addition to the standard practice of assessing their suicide risk. Further research is urgently required to determine the mechanisms underlying the reduced life expectancy of people with PD.

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Table 1 Characteristics and 4-year mortality of patients with personality disorder

Characteristics	Number of PD cases (Number of deaths, %)
Total cohort	1836 (43, 2.34%)
Gender	
Female	1103 (23)
Male	733 (20)
Ethnicity	
White British	1340 (39)
Mixed	29 (0)
Asian or Asian British	41 (3)
Black or Black British	226 (1)
Other	84 (0)
Not stated/Unknown	116 (0)
Age group	
15-44 years	1354 (20)
45-64 years	419 (11)
65 + years	63 (12)
Personality disorder	
Any personality disorder (F60-F61)	1836 (43)
Cluster A (F60.0, F60.1)	109 (2)
Cluster B (F60.2, F60.3, F60.31, F60.4)	924 (18)
Cluster C (F60.5, F60.6, F60.7)	62 (1)
Other	741 (22)

Table 2 Estimated life expectancy at birth of patients with personality disorder in southeast London

	Female		Male	
	Life Expectancy (95% CI, number of deaths)	Difference from female general population*	Life Expectancy (95% CI, number of deaths)	Difference from male general population*
All personality disorders	62.9 (61.5 – 64.3, n=23)	-18.7 years	59.7 (57.9 – 61.5, n=20)	-17.7 years

*Life expectancy at birth 2006-08 in England and Wales: Female = 81.6 years; Male = 77.4 years [21]

Table 3 Age- and gender-standardized mortality ratios (SMRs) for personality disorder, stratified by gender and age groups in 2007-2010

		Number of cases	Standardized mortality ratio (95% CI, number of deaths)
Total PD group		1836	4.2 (3.03 – 5.64, n=43)
Females		1103	5.0 (3.15 – 7.45, n=23)
Males		733	3.5 (2.17 – 5.47, n=20)
Age	15 – 44 years	1354	10.3 (6.29 – 15.91, n=20)
	45 – 64 years	419	3.6 (1.78 – 6.37, n=11)
	65 and over	63	2.5 (1.31 – 4.43, n=12)