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Cardiovascular risk factors among patients with schizophrenia, bipolar, depressive, anxiety, and personality disorders

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ABSTRACT

Background: The evidence informing the management of cardiovascular risk in patients with psychiatric disorders is weak.
Methods: This cohort study used data from all patients, aged ≥ 30, registered in 140 primary care practices (n = 524,952) in London to estimate the risk of developing diabetes, hypertension, hyperlipidemia, tobacco consumption, obesity, and physical inactivity, between 2005 and 2015, for patients with a previous diagnosis of schizophrenia, depression, anxiety, bipolar or personality disorder. The role of antidepressants, antipsychotics and social deprivation in these associations was also investigated. The age at detection of cardiovascular risk factor was compared between patients with and without psychiatric disorders. Variables, for exposures and outcomes, defined from general practitioners records, were analysed using multivariate regression.
Results: Patients with psychiatric disorders had an increased risk for cardiovascular risk factors, especially diabetes, with hazard ratios: 2.42 (2.20–2.67) to 1.31 (1.25–1.37), hyperlipidemia, with hazard ratios: 1.78 (1.60–1.97) to 1.25 (1.23–1.28), and obesity. Antidepressants, antipsychotics and social deprivation did not change these associations, except for smoking and physical inactivity. Antidepressants were associated with higher risk of diabetes, hypertension and hyperlipidemia. Antipsychotics were associated with a higher risk of diabetes. Antidepressants and antipsychotics were associated with lower risk of other risk factors. Patients with psychiatric conditions have later detection of cardiovascular risk factors. The interpretation of these results should acknowledge the lower rates of detection of risk factors in mentally ill patients.
Conclusions: Cardiovascular risk factors require special clinical attention among patients with psychiatric disorders. Further research could study the effect of antidepressants and antipsychotics on cardiovascular risk factors.

1. Introduction

Patients with psychiatric disorders have a shorter life expectancy, with cardiovascular disease being the major contributor to these premature deaths [1,2]. However, the epidemiological evidence informing the management of cardiovascular risk (CVR) in these patients is still too limited in order to inform effective clinical interventions. This contributes to a poor control of CVR factors and poor cardiovascular outcomes [3]. Patients with psychiatric disorders often have an unhealthy lifestyle, which is associated with and increased CVR [4,5]. While the prevalence of some cardiovascular risk factors, such as hypertension and diabetes, have been studied recently in a number of systematic reviews for patients with specific diseases, i.e. depression or schizophrenia, the evidence is weaker for patients with other conditions such as anxiety or personality disorders [6–10]. These reviews highlight limitations in the some of the available evidence, including non-prospective study design, small sample size, and inadequate data on demographic and lifestyle factors. An association between antidepressants or antipsychotics, and a higher prevalence of CVR factors such as diabetes has been identified

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[7,11–14]. Social deprivation is strongly associated with psychiatric conditions and with higher CVR as well [15–17]. However, the extent to which antidepressants, antipsychotics, and social deprivation contribute to the development of CVR factors among patients with different psychiatric disorders is unclear [3]. Many symptoms of psychiatric conditions, including cognitive impairment, together with other factors, such as the stigmatization of these patients, make difficult their access to health care [2]. This may result in later diagnoses and less effective management of CVR factors.

The first objective of this study is to estimate the risk of developing incident type 2 diabetes, hypertension, hyperlipidemia, active smoking, obesity, and physical inactivity, over a ten year period, for patients previously diagnosed with schizophrenia, bipolar disorder, depression, anxiety or personality disorders. The second objective is to investigate the potential explanatory role of antidepressants, antipsychotics and deprivation in the association between each psychiatric condition and each CVR factor. The third objective is to compare the age at the time of diagnosis of each CVR factor, in patients with and without psychiatric disorders.

2. Methods

The study conformed to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) study design recommendations [18].

2.1. Study population

Data from the 524,952 patients living in three inner boroughs of east London (UK), registered with the local primary care surgeries, were used. Anonymized demographic and clinical data recorded in primary care electronic health records were extracted using EMIS web software from 140 of the 144 surgeries in the boroughs (four surgeries used a different computer system and were not included) for all patients aged 30 years and over in March 2015. Patients from that age category were selected because most cardiovascular events occur in patients over 30 and clinical guidelines suggest periodic screening for CVR factors in patients from the age of 40 [19,20].

2.2. Variable definition

Sociodemographic variables included age, gender, and self-reported ethnic group. The Townsend score for social deprivation was also recorded [21]. Ethnicity was grouped into four categories: white, south Asian, black African/Caribbean and other. Individuals of mixed ethnicity were grouped with the relevant ethnic minority group. Clinical data included routinely recorded diagnoses of schizophrenia, bipolar disorder, depression, anxiety, personality disorders, type 2 diabetes, hypertension, hyperlipidemia, obesity, and self-reported smoking status and physical inactivity. Given the large number of exposures and outcomes analysed, all clinical data were coded as binary variables. A systematic approach to accurately identify each psychiatric condition and CVR factor from patient records was used. Lists of terms (Read codes) used by primary care physicians were compiled for each psychiatric condition and CVR factor using the UK National Health Service Clinical Terminology Browser version 2 10-01-2013 (Appendix A). Data was also extracted on prescriptions of antidepressants and antipsychotic drugs according to their classification in the British National Formulary [22] (Appendix B). Obesity was defined by the record of body mass index > 30. The medical records included terms reporting whether patients were smokers or non-smokers. There were also terms reporting different frequency for physical activity, and patients were categorized accordingly: ≥ 3 sessions of exercise a week active, and < 3 inactive [23]. There were only terms reporting the presence, but not the absence, of other CVR factors such as diabetes, psychiatric conditions, or prescribed drugs, and patients without these terms in their records were considered not to have them.

2.3. Statistical analysis

The risk of being diagnosed with type 2 diabetes, hypertension, hyperlipidemia, being a current smoker, obese, or physically inactive, between March 2005 and March 2015, was compared for patients with and without a diagnosis of schizophrenia, bipolar disorder, depression, anxiety, or personality disorder, at the beginning of that period. Patients with diagnosis of a CVR factor before the March 2005 were not included in the analysis for that specific outcome. When a CVR factor (i.e. obesity) had been recorded more than once during the follow up, only the first record in clinical notes was included in the analysis.

Cox regression models adjusted for potential confounders (age, gender, and ethnicity) were first used to estimate the associations of each psychiatric condition with each CVR factor. In a second step potential explanatory factors for the associations (prescription of antidepressants and antipsychotics before the 19th March 2005, and Townsend deprivation score), were included in the models. The age at the time of having each CVR factor recorded in patients with and without schizophrenia or other psychiatric disorder was compared using linear regression models adjusted for gender and ethnicity. The whole sample was treated as a single cohort, as patients were all living in the same area of London, where there is free access to health care for everyone, health care is standardized, and all patients were treated as independent within the cohort.

2.4. Ethical approval

All data were anonymised and managed according to the UK National Health Service information governance requirements. Ethical approval was not required for the use of routinely collected anonymised data in this observational study.

3. Results

A total of 524,952 patients, with mean age 45.9 (SD: 13.9), were included in the study. The sociodemographic description of the cohort, the medications prescribed, and the CVR risk factors diagnosed in patients with each psychiatric condition, are presented in Tables 1 and 2.

3.1. Association between psychiatric disorders and cardiovascular risk factors

The risk for CVR factors in patients with each psychiatric disorder is presented in Table 3.

Patients with all psychiatric disorders had an increased risk of having an incident diagnosis of type 2 diabetes, with Hazard Ratios (HRs) ranging from 1.31 (1.25–1.37) for those with anxiety disorders to 2.42 (2.20–2.67) $P < 0.001$ for those with schizophrenia. The risk of hyperlipidaemia was also increased for all patients with psychiatric disorders, with HRs ranging from 1.25 (1.23–1.28), for those with anxiety disorders, to 1.78 (1.60–1.97) $P < 0.001$ for those with bipolar disorder. Obesity was also associated with all psychiatric conditions, with HR ranging from 1.09 (1.06–1.12), for those with anxiety disorders, to 1.90 (1.67–2.15) $P < 0.001$ for those with bipolar disorders. Patients with schizophrenia, depression and anxiety had an increased risk of hypertension.