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Cohort profile: the Swedish National Quality Register for bipolar disorder (BipoläR)

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ABSTRACT

Purpose The Swedish National Quality Register for bipolar affective disorder, BipoläR, was established in 2004 to provide nationwide indicators for quality assessment and development in the clinical care of individuals with bipolar spectrum disorder. An ancillary aim was to provide data for bipolar disorder research.

Participants Inclusion criteria for registration in BipoläR is a diagnosis of bipolar spectrum disorder (ICD codes: F25.0, F30.1–F30.2, F30.8–F31.9, F34.0) and treatment at an outpatient clinic in Sweden. BipoläR collects data from baseline and annual follow-up visits throughout Sweden. Data is collected using questionnaires administered by healthcare staff. The questions cover sociodemographic, diagnostic, treatment, outcomes and patient reported outcome variables. The register currently includes 39 583 individual patients with a total of 75 423 baseline and follow-up records.

Findings to date Data from BipoläR has been used in several peer-reviewed publications. Studies have provided knowledge on effectiveness, side effects and use of pharmacological and psychological treatment in bipolar disorder. In addition, findings on the diagnosis of bipolar disorder, risk factors for attempted and completed suicide and health economics have been reported. The Swedish Bipolar Collection project has contributed to a large number of published studies and provides important information on the genetic architecture of bipolar disorder, the impact of genetic variation on disease characteristics and treatment outcome.

Future plans Data collection is ongoing with no fixed end date. Currently, approximately 5000 new registrations are added each year. Cohort data are available via a formalised request procedure from Centre of Registers Västra Götaland (e-mail: registercentrum@vgregion.se). Data requests for research purposes require an entity responsible for the research and an ethical approval.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The cohort includes a large number of cases and within-person longitudinal data.
⇒ Evidence for generalisability and validity as a sample of the patient population in Sweden diagnosed with bipolar disorder.
⇒ Information in BipoläR can be linked to information in other national registries thanks to Swedish personal identity numbers, which greatly increases the number of possible research questions.
⇒ BipoläR do not cover the whole Swedish bipolar disorder population and a higher coverage would increase power and further reduce the risk for sampling bias.
⇒ The number of registrations per individual varies and when time series are required to answer a specific question, power can be greatly reduced.

INTRODUCTION

Bipolar disorder is a lifelong psychiatric disorder with serious negative consequences for afflicted individuals, next of kin and society as a whole.[1 2] The estimated prevalence of bipolar spectrum disorders, defined as bipolar I, bipolar II and subthreshold bipolar disorder, is 2.4%.[3] Available interventions include acute and prophylactic drug treatments, as well as psychological interventions such as psychoeducation programmes. There are, however, significant dissimilarities across counties with respect to drug treatment and availability of psychological treatment. The chronic nature of bipolar disorder means that patients generally have regular healthcare contact to manage the disorder. The primary aim of the of Swedish National Quality Register for Bipolar Disorder (BipoläR) is to provide outcome measures for monitoring the quality of care and outcomes for bipolar disorder patients in Sweden. The ultimate goals are high and equal quality of care in terms of early diagnosis, adequate follow-up and best treatment of bipolar disorder to achieve better outcomes and improve the lives of persons with bipolar disorder. The register provides data for open comparisons, quality improvement projects, as well as analytical and statistical support to various stakeholders.

A secondary aim of BipoläR is to provide data for clinical research on bipolar disorder.

Several research questions can be answered that benefit from large sample sizes and clinical representativeness.

COHORT DESCRIPTION

Swedish law regulates the use of quality registers. Qualified national quality registers are eligible for public funding channelled through the Swedish Association of Local Authorities and Regions. This association supports approximately one hundred registers financially. BipoläR, established in 2004, contains individualised data concerning case mix, medical interventions and treatment outcomes. Participation in this register is voluntary for the clinician even though at times there have been incentives from healthcare providers to increase the clinicians' rate of participation. Patients are informed prior to inclusion and can request to have personal data erased at any time. Registering units include both private and public psychiatric outpatient healthcare units in Sweden. Nurses, psychiatrists or other staff trained in the diagnosis and treatment of bipolar disorder who have access to all clinical data for the patient, collects the information. After initial registration, the patients are to be followed up annually.

As of January 2021, the registry included one or more patient interviews for 24 397 unique individuals. Overall, 60.1% of the individuals are women and the mean age at first registration is 46.5 years with an SD of 16.2 years. The annual number of registrations has fluctuated over the years, peaking during a period where the state provided economic incentives for psychiatric clinics to promote registration. The median number of registrations per individual is 2 registrations, with an IQR of 2, and the median follow-up time is 1.1 years, with an IQR of 3.6 years.

The aim of the register is to provide baseline and annual follow-up information for individual patients for as long as they receive outpatient treatment for bipolar disorder. In reality, the number of annual follow-ups per patient varies.

The coverage, that is, the proportion of the total number of individuals diagnosed with bipolar disorder in Sweden entered into the register, has varied over the years and was estimated at 21.7% in 2020. As reference, the peak coverage during the period from 2014 to 2020 was 38.9% in 2015 and the lowest coverage was 21.1% in 2019. Coverage is calculated based on an identifiable population in the mandatory National Patient Register with a bipolar disorder diagnosis that is possible to register (defined as a registered outpatients' visit during current and previous year at the same care unit). More than 90% of Swedish outpatient care units providing care for individuals with bipolar disorder are linked to the register. Factors that influence coverage include the degree of diagnostic specialisation at healthcare units, management priorities, perceived value of registration, labour cost of registration and patient follow-up routines.

The completeness of data varies between variables in the register. For some variables, for example, subdiagnosis, completeness is very high, but is considerably lower for other variables. Only a few questions are mandatory for registration at data entry, but a warning system flagging missing data aims to reduce the risk of missed entry of data.

The primary data source for BipoläR is a questionnaire-based interview that captures a set of variables. Since the primary aim of the register is to provide outcome measures for monitoring the quality of care, the questionnaire has been revised over time to account for changes in quality monitoring priorities. Data from questions that have been removed, altered or added may have reduced completeness depending on the time frame for selection of data.

Source data is entered into a database hosted on a registration platform (Stratum, Centre of Registers Västra Götaland), using a web-based interface, or registered on paper forms and then transferred to the database using the web interface. Data from most of the Stockholm region is entered using semiautomated transfer from patient charts via an intermediate data warehouse. This reduces the amount of labour required for registration but can affect data quality in different ways compared with manual registration in a web-based interface. For example, failure to automatically capture data can result in complete missingness for a variable whereas manual registration is more susceptible to random errors in individual data.

BipoläR questionnaire structure
The register contains the following information:

BipoläR contains individualised data on bipolar subtype (bipolar type I, II, not otherwise specified (NOS), schizoaffective disorder and cyclothymia) and comorbid psychiatric conditions according to Diagnostic and Statistical Manual of Mental Disorders 4th. edition (DSM-IV), comorbid somatic conditions as defined in International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10), interventions and outcomes. The register also contains data on number of depressive, manic, hypomanic and mixed episodes, history of suicide attempts, occupational functioning and sick leave days.

Employment status and sick leave
The registry provides two indicators that measure individual functional outcome in terms of employment status and sick leave. Employment status for the 12 months prior to registration is recorded as one or two categorical data points that range from more than 50% employment on the open labour market via various forms of protected employment to unemployment. Current level of sick leave is measured on an interval scale from 0% to 100%.

Diagnosis

The registry contains information on bipolar subtype according to DSM-IV criteria for type 1, type 2 and NOS bipolar disorder. The register also includes individuals with schizoaffective disorder ICD-10 code (F25.0) and since 2014 individuals with cyclothymic disorder (F34.0). As a separate indicator, information on other comorbid psychiatric diagnoses is collected. These include attention deficit hyperactivity disorder (F90.0, F90.1, F90.9, F98.8), substance use disorder (F10.1, F10.2, F11.1, F11.2, F19.1, F19.2), emotionally unstable personality disorder (F60.3), autism spectrum disorders (F84.0, F84.1, F84.5), agoraphobia (F40.0), social phobia (F40.1), panic disorder (F41.0), post-traumatic stress disorder (PTSD, 43.1), generalised anxiety disorder (F41.1) and obsessive–compulsive disorder (F42.0, F42.1, F42.2).

Clinical assessment

The use of structured instruments for the primary diagnosis and the use of neuropsychological assessments and alcohol use screening is included in the register.

Clinical outcome

Measures of outcomes include relapse in depressive, manic, hypomanic and mixed episodes during the 12-month period prior to the interview. Further, the register contains information on the total duration of mood episodes and the presence of an euthymic period during the 12-month period prior to the interview. The registry also includes information on suicide attempts during the same time interval.

Treatment

Indicators provide information on current pharmacological treatment including lithium (N05AN01), other mood stabilisers (N03AF01, N03AE01, N03AX09, N03AF02, N03AX11, N03AG01), antipsychotics (R06AD01, N05AX12, N05AB01, N05AB02, N05AF01, N05AD01, N05AA01, N05AF03, N05AH02, N05AA02, N05AD03, N05AH03, N05AX13, N05AB03, N05AG02, N05AH04, N05AX08, N05AE03, N05AL02, N05AC03, N05AE04, N05AF05), antidepressants (N06AX22, N06AA09, N06AX12, N06AB04, N06AX21, N06AB10, N06AB03, N06AX03, N06AX11, N06AG02, N06AX06, N06AA10, N06AB05, N06AF03, N06AX18, N06AB06, N06AF04, N06AA06, N06AX16), central stimulants (N06BA09, N06BA04, N06BA02, N06BA07, N06BA12), and benzodiazepines (N05BA12, N05BE01, N05BA01, N05CD03, N05BB01, N05BA06, N05CM02, N05CD02, N05BA04, N03AX16, N06AD02, N05CM06, N05CD05, N05CM09, N05CF03, N05CF02, N05CF01). In addition to pharmacological treatment, we record access to psychoeducation and other psychological treatments.

Somatic status

Measures of HbA1c, blood pressure, nicotine use, weight and height are recorded. For persons treated with lithium, serum lithium, creatinine or cystatin C are recorded.

Patient reported outcome and experience measures

We use a set of variables developed in-house to record patient reported outcome and experience measures. There are four questions where the patient rates their care experience, scored as agreement with a three or five level scale. One question to score sleep quality and two questions for patient reported outcome, which are analogous to the activity level and health questions used in the EQ-5D instrument.

Archived data

Since the register questionnaire has undergone several modifications since registration started, there is additional published data. For some indicators, for example, (hypo) manic or depressive relapse, more detailed information was collected in earlier versions of the questionnaire. Measures of the severity of the disorder were collected in the form of the Clinical Global Impression—Severity scores and functioning as Global Assessment of Function—Symptom and Function scores. Information on self-harm other than suicide attempt and in-patient care was also collected. Publications that used data from earlier versions of the questionnaire also include information on levothyroxine, indicators to track pharmaceutical evaluations and changes in treatment due to adverse effects. The presence of other conditions including diabetes, cardiovascular disorder, kidney disease, thyroid function disorders, psoriasis, pregnancy and breast feeding was also recorded. In addition, there was information on nicotine use. From 2015 to the end of 2018, the register contained patient reported outcome measures using the EQ-5D Questionnaire. This data is no longer available at the Centre of Registers Västra Götaland but may be archived by the entities responsible for the research.

The Swedish Bipolar Collection

The Swedish Bipolar Collection (SWEBIC) is a sequential study consisting of SWEBIC I and SWEBIC II aiming to include 11 000 patients with a diagnosis of bipolar disorder. SWEBIC I enrolled patients between 2009 and 2012. Of the over 6000 included patients, the majority were identified through BipoläR. The aim of SWEBIC is to identify genetic variants and environmental factors that influence the risk of developing bipolar disorder. In addition to the DNA collection, serum samples were collected for proteomics analyses. SWEBIC II enrolled 5000 study participants 2017–2022 and used BipoläR as the primary source of patient recruitment. This means that a substantial proportion of the clinical data in BipoläR can be linked to biological data from SWEBIC, greatly improving the potential to use BipoläR for research.

Patient and public involvement

A representative from a patient organisation representing mood disorder patients is a member of the steering committee for the register. The steering committee advises the record holder on the management and development of the register.

FINDINGS TO DATE

The data quality has been assessed using both chart reviews and mandatory health registers. The patient population coverage has at best been round one-third of all bipolar disorder patients residing in Sweden as identified through the National Patient Register. The National Patient Register includes all psychiatric in-patient care in Sweden from 1973, and since 2001 the register also covers psychiatric outpatient care from both public and private caregivers. The issue of representativeness of data in BipoläR with respect to the general population of individuals diagnosed with bipolar disorder has not been fully resolved.

Data from BipoläR has been used in several peer-reviewed publications. Key findings from published data include support for the use of lithium as a first-line treatment for bipolar disorder[4] and the effectiveness of psychoeducation.[5] A study of metabolic risk associated with treatment with second-generation antipsychotics did not replicate risk increases identified in clinical trials.[6] In addition to providing information on changes in mood stabiliser prescription patterns,[7] we have shown that gender[8] and educational level[9] affects the use of different treatment options in bipolar disorder.

We have also provided evidence to support the current use of subdiagnostic categories[10] and highlighted challenges in diagnosing bipolar disorder.[11] Further, studies have described both overlapping and unique risk factors for attempted[12] and completed[13] suicide in persons with bipolar disorder. A health economic study gives valuable information on the relative contribution of different costs to the high societal cost associated with bipolar disorder.[1]

The SWEBIC project has contributed to a large number of published studies and provides important information on the genetic architecture of bipolar disorder,[14–39] the impact of genetic variation on disease characteristics[31 40–43] and treatment outcome.[44–46]

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Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Cohort description section for further details.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study. Access and use of data in national healthcare registers is regulated by specific national legislation in addition to general data protection legislation. Region Västra Götaland is the personal data controller for BipoläR. By delegation, Centre of Registers Västra Götaland handles questions on access to and use of data. For researchers, cohort data are available via a formalised request procedure from Centre of Registers Västra Götaland (e-mail: registercentrum@vgregion.se). More information on background and questionnaires as well as an interactive tool for summary statistics can be found at https://bipolar.registercentrum.se.

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