The Breast 25 (2016) 38–44

Contents lists available at ScienceDirect

The Breast

journal homepage: www.elsevier.com/brst

Original article

Psychiatric morbidity and non-participation in breast cancer screening

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ARTICLE INFO

Article history:
Received 18 August 2015
Received in revised form
18 September 2015
Accepted 5 October 2015
Available online 12 November 2015

Keywords:
Breast cancer
Screening participation
Denmark
Psychiatric diseases
Psychoactive medicine

ABSTRACT

Background: Organised breast cancer screening is currently one of the best strategies for early-stage breast cancer detection. However, early detection has proven challenging for women with psychiatric disease. This study aims to investigate psychiatric morbidity and non-participation in breast cancer screening.
Methods: We conducted an observational cohort study including women invited to the first organised screening round in the Central Denmark Region. Data on psychiatric diagnosis, psychoactive prescription medicine and consultation with private psychiatrists were obtained from Danish registries and assessed for a period of up to 10 years before the screening date.
Results: The cohort comprised 144,264 women whereof 33.0% were registered with an indication of psychiatric morbidity. We found elevated non-participation propensity among women with a psychiatric diagnosis especially for women with schizophrenia and substance abuse. Also milder psychiatric morbidity was associated with higher non-participation likelihood as women who had redeemed psychoactive prescription medicine or have had minimum one consultation with a private psychiatrist were more likely not to participate. Finally, we found that the chronicity of psychiatric morbidity was associated with non-participation and that woman who had a psychiatric morbidity defined as 'persistent' had higher likelihood of non-participation than women with recently active morbidity or inactive psychiatric morbidity.
Conclusion: This study showed a strong association between psychiatric morbidity and an increased likelihood of non-participation in breast cancer screening in a health care system with universal and tax-funded health services. This knowledge may inform interventions targeting women with psychiatric morbidity as they have poorer breast cancer prognosis.

Introduction

Breast cancer is the second leading cancer type worldwide (10.9% of all cancers) and is the most common cancer type in Danish women [1,2]. Many Western countries use organised breast cancer screening to diagnose breast cancer at an early stage in an attempt to improve prognosis. Although the current literature are inconclusive as to whether organised breast cancer screening reduces mortality [3,4], a recent independent panel from the UK concluded that organised breast cancer screening significantly reduces breast cancer mortality with 20% [5]. In Denmark, all women between 50 and 69 years of age are offered biennially to free of charge screening. The Danish health care system is organised as a universal tax-funded system where all citizens have access to free and equal health care and treatment [6].

Women with psychiatric diseases have higher mortality from breast cancer than women without psychiatric diseases [7], and they are more likely to be diagnosed with advanced breast cancer stage and to delay or refuse treatment [8,9]. Women with

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http://dx.doi.org/10.1016/j.breast.2015.10.002
0960-9776/

psychiatric diseases may therefore form a special target group where early diagnosis of breast cancer requires a special effort.

The association between psychiatric disease and non-participation in breast cancer screening is not yet established. Some studies find no such association [10–14], whereas others conclude that women with psychiatric disease are more likely not to participate [15–25]. The majority of these studies used questionnaire data [10–12,14,16–20,26,27], whereas others analysed claim or insurance data [21,23,24], medical records [13,15,25] or registers [22]. Some studies restricted their analysis to psychiatric patients only and had no comparison group [26,27]. Other studies analysed combined groups of psychiatric disabilities [12,13,15,19,26] or analysed only one psychiatric condition [11,17,18,21]. A recent meta-analysis found that women with psychiatric diseases were more likely not to participate in breast cancer screening [28] but also pointed out that some psychiatric diseases are not covered properly in the current literature such as anxiety and alcohol abuse. The study further found that the setting of the majority of the current literature is situated in North America [28] and studies are therefore needed from other health care settings. The association between psychiatric morbidity and non-participation has to our knowledge not been studied in the Nordic countries.

The current literature also provides no answers to whether the chronicity of the psychiatric disease is associated with screening. Psychiatric morbidity may vary in severity over time and there may be periods where the women have no need of psychiatric care and other periods where they have. It could be hypothesised that women in need of psychiatric care in the time of screening are more likely not to participate than women with a previous history of psychiatric morbidity. Although severity of psychiatric morbidity has been studied a few times [22,23], which found that e.g. having two psychiatric diagnoses was strongly related to non-participation [22,23], the issue of psychiatric chronicity remains unanswered in the current literature.

The purposes of this register-based study are therefore to investigate 1) if being registered with a psychiatric disease is associated with non-participation in screening, 2) if different psychiatric diseases affect non-participation differently and 3) if the chronicity of psychiatric morbidity is associated with non-participation.

Material and methods

Setting

The setting was the Central Denmark Region where the first breast cancer screening round took place between 28 February 2008 and 31 December 2009 as a free of charge offer to all women between 50 and 69 years of age.

Study design

An observational, register-based, historical cohort study was performed. We included 144,264 women for analysis living in the region at the date of their scheduled screening (for a detailed description, see Ref. [29]). Information on psychiatric morbidity was obtained from national registers and assessed for a period of up to 10 years before each woman's screening date.

Data collection

Every Danish citizen has a unique central registration number (CRN) [30] which is used for registering any contact with the Danish health care system. The CRN was used to obtain current personal data on the screening date as well as data on participation or non-participation from a regional administrative database. The CRN was also used to link data across the sources mentioned below. We restricted data capture to the first screening round. Women who took part in this round were categorised as 'participants', those who did not as 'non-participants'.

Every psychiatric department in Denmark has been reporting all inpatient, outpatient and emergency contacts to the Danish Psychiatric Central Research Register (PCRR) since 1970 [31]. From this register, we obtained data on registered contacts for five psychiatric diseases, based on the International Classification of Diseases, 10th version (ICD-10), which we hypothesised could be associated with non-participation including: schizophrenia including psychotic episodes (ICD-10 codes: F20-F29); affective disorders including depression, bipolar and manic disorders (ICD-10 codes: F30-39); anxiety-related disorders (ICD-10 codes: F40-41); eating disorder (anorexia nervosa and bulimia nervosa) (ICD-10 codes: 50.1, 50.2); and alcohol and substance abuse-related disorders (F10-F19). The same psychiatric contacts were searched for in the National Patient Registry (NPR) [32] to avoid missing a registration of a psychiatric contact not captured in the PCRR. The NPR is a national register with which since 1995 has included data on inpatient, outpatient and emergency contacts [32].

Data on psychoactive prescription medicine for anxiety, depression and psychosis were obtained from the Register of Medicinal Product Statistics (RMPS) [33] to which all Danish pharmacies and hospital pharmacies report all prescribed drugs on a monthly basis and have done so since 1994. See Appendix 1 for ATC codes used. Finally, from the Danish National Health Service Registry (HSR) [34], we obtained information on any first consultation with a private psychiatrist (Health service code: 24-0110).

Operationalisation of variables describing psychiatric disease

Indication of psychiatric disease

This variable was generated using information from all applied registers. It was coded 'yes' if minimum one of the following criteria were fulfilled: 1) one or more contacts to a psychiatric department with schizophrenia, affective disorders, anxiety, eating disorder or substance abuse in the period from 0 to 10 years before the screening date, and/or 2) a minimum of two prescriptions of antidepressant, antianxiety or antipsychotic medicine from 0 to 8 years before the screening date, and/or 3) registered with a first consultation with a private psychiatrist from 0 to 8 years before the screening date.

Specific psychiatric disease

We generated a variable for each of the five psychiatric diseases which was categorised as 'yes' if the disease in question was present in the PCRR or the NPR and 'no' if not. Eating disorders were not analysed in the stratified regression analyses as this group contained only 22 women. Furthermore, we generated three separate variables for the three psychoactive prescription types (antidepressants, anxiety medication and antipsychotics) if the woman had received a minimum of two prescriptions of each drug from 0 to 8 years up to the screening date. Women who were registered in the PCRR or the NPR with one of the psychiatric diagnoses were omitted from this analysis as we here wanted to assess only the impact of milder psychiatric morbidity.

Chronicity of psychiatric disease

This was operationalised as having "no indication of a psychiatric disease" or having an indication of "inactive", "persistent" and