



## Original article

## Clinical characteristics of breast cancer patients with mental disorders



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## ABSTRACT

**Background:** Severe mental disorders are thought to affect the diagnosis and treatment of breast cancer because of their lower awareness and understanding of the disease and their reduced ability to cooperate with medical staff. We analyzed the clinical features of patients with breast cancer and pre-existing mental disorders such as schizophrenia, dementia, and intellectual disability. **Patients and methods:** We reviewed the records of 46 patients who were diagnosed with schizophrenia, dementia, or intellectual disability, before being diagnosed with breast cancer. Three patients had more than 2 mental disorders. All patients underwent curative surgical treatment between September 1992 and January 2015. Patients' clinicopathological information was compared with a control group of 727 breast-cancer patients without mental disorders seen during the same period.

**Results:** Patients with mental disorders were less likely to be aware of their own breast cancer; the lesions were often found by other people such as family, care staff, and medical staff. Breast cancer patients with mental disorders had significantly more advanced T factors and overall stage at the time of surgery than their counterparts without mental illness, more patients underwent total mastectomy, and fewer patients underwent postoperative adjuvant chemotherapy and radiation. Biological markers such as estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2 (HER2) expression were not significantly different between groups. Disease-free survival and overall survival were not significantly different between groups.

**Conclusion:** Patients with mental disorders receive less postoperative adjuvant chemotherapy; however, their outcomes were not worse than those of patients without mental disorders.

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## 1. Introduction

Breast cancer commonly affects women worldwide [1], and many breast cancer patients also have mental disorders. Although the finding is controversial, patients in Asian-African population with schizophrenia reportedly have shown a higher relative risk of breast cancer than those without schizophrenia (1.37, 95% confidence interval: 1.12–1.63) [2]. Severe mental disorders, such as schizophrenia, are thought to affect the diagnosis and treatment of breast cancer because of patients' lower awareness and understanding of the disease and impaired cooperation with medical staff [3]. For example, because schizophrenia patients often deny or ignore that they have cancer and let the disease progress, they are

frequently diagnosed with advanced disease [4]. Patients with Alzheimer disease are often diagnosed at advanced stages because of their poor symptom recognition and noncompliance with recommended screening [5]. Even when their lesions are amenable to curative surgery, there are difficulties in selecting a treatment plan and obtaining informed consent for surgery and adjuvant therapy [5,6]. Only a few studies have been published on the outcomes in patients with breast cancer and mental disorders.

Here we report our analysis of the clinical features, clinicopathological factors, treatments, and outcome of breast-cancer patients with mental disorders who underwent curative surgery.

## 2. Patients and methods

## 2.1. Patients

We enrolled a total of 773 patients with primary breast cancer without distant metastasis, who underwent curative surgical

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treatment at Kagoshima University Hospital, Kagoshima, Japan, between September 1992 and January 2015. Mental disorders were defined in 3 categories: schizophrenia, dementia, and intellectual disability. All patients with schizophrenia were diagnosed by psychiatrists and received antipsychotic medication. All patients with dementia were diagnosed by psychologists or general practice physicians, and all patients had difficulties in leading independent daily lives. All patients with intellectual disabilities had been diagnosed in childhood, and some lived in a care facility. All patients with mental disorders had been diagnosed before receiving a diagnosis of breast cancer. The degree of severity or subclassification of each mental disorder was not available. The clinicopathological factors in the mental disorder group were compared with patients without mental disorders (control group). Adjuvant therapy was selected for each patient based on the National Comprehensive Cancer Network guidelines [7]. The TNM classification, seventh edition, was used to determine staging [8]. This study was approved by the institutional review board of Kagoshima University Hospital, and all patients provided written informed consent.

## 2.2. Statistical analysis

Differences in the clinicopathological factors between the groups were evaluated using analysis of variance for continuous variables and the Pearson chi-square test for categorical variables. Disease-free survival (DFS) and overall survival (OS) were measured from the time of the first surgery until the date of death or last follow-up. Survival curves were constructed using the Kaplan-Meier method, and statistical significance between 2 groups was assessed using the log-rank test. Statistical analysis was performed using JMP Pro, version 12.1.0 for Mac OS (SAS Institute Japan Ltd. Tokyo, Japan). *P* values of less than 0.05 were considered statistically significant.

## 3. Results

Of the 773 patients with breast cancer, 46 fell into one of the 3 classifications of mental disorder listed in the Methods (mental disorder group). Patients in the mental disorder group, especially those with dementia, were significantly older than those in the control group (Table 1). The impetus for discovery of the breast cancer lesion was different between groups. Patients in the mental disorder group with breast cancer were less likely to be aware of the disease, and the tumors were often found by other people such as family, or the care staff or medical staff. The frequency of discovery by screening examination, including mammography, was not significantly different between groups (Table 1).

The T factor and overall stage of disease were significantly more advanced in patients in the mental disorder group at the time of surgery. However, other pathological factors, including the N factor, stage, presence of lymphatic or venous invasion, and nuclear grade were not significantly different. Pathological factors relating to tumor subtype were not significantly different between groups,

except that patients with schizophrenia were more likely to exhibit human epidermal growth factor receptor 2 (HER2) positivity (Tables 2 and 3). Among patients with T2 disease, the tumors of those with mental disorders showed significantly lower nuclear grade than the tumors of the control group. Thirty-five percent (50/142) of tumors in the control group and 7% (1/14) of tumors in the mental disorder group were nuclear grade 3 ( $p = 0.033$ ). Additionally, among patients with T4 disease, a smaller proportion of patients with mental disorders than controls had lymph node metastasis, as follows: 33% (1/3) and 89% (24/27), respectively, ( $p = 0.014$ ).

More patients in the mental disorder group underwent mastectomy, and fewer patients received postoperative adjuvant chemotherapy and radiation therapy. The follow-up period of the patients with mental disorders was significantly shorter than that of the controls (Table 4). The recurrence rate and rate of cancer-specific death were not significantly different between groups (Fig. 1).

## 4. Discussion

Patients with severe mental disorders are often less aware of their disease, exhibit less understanding, and are less likely to cooperate in their care, posing a difficulty for appropriate diagnosis and treatment of breast cancer [3].

To assess the clinical features of breast cancer patients with mental problems, we selected 3 mental disorders for this study—schizophrenia, dementia, and intellectual disability—because these entities have similar characteristics in that patients are less aware and seldom complain about their own symptoms. With this type of background, the tumors are likely to be advanced at the time of diagnosis.

Mental disorders such as schizophrenia, dementia, and intellectual disability are relatively common [9–11], and patients with mental disorders are frequently seen in the clinical setting of breast cancer. The number of patients with dementia is estimated to double with the aging population to 81.1 million by the year 2040 [12]. Therefore, the clinical management of breast cancer patients with mental disorders will become very important.

We retrospectively analyzed the clinicopathological factors of patients with breast cancer without distant metastasis, who underwent curative surgery. We found that the patients with mental disorders were older than the control group at the time of diagnosis, because most patients with dementia were elderly. And more breast masses were detected by others (e.g., family, caregivers, and primary care doctors) in the mental disorder group than in the control group, where many patients detected their own tumors. This is consistent with the results of Donnelly's study, which found that patients with mental disorders denied or ignored the lump in their breast [13]. A previous study has found lower rates of screening mammographies performed for people with a range of mental disorders [14]; however, the frequency of screening examinations was not significantly different between the groups in our

**Table 1**  
Clinical characteristics of patients.

	Control	With mental disorders		Schizophrenia		Dementia		Intellectual disability	
	N = 727	N = 46	p value	N = 23	p value	N = 16	p value	N = 10	p value
Age	59 ± 14	65 ± 14	0.0089	61 ± 11	0.61	79 ± 6	<0.0001	52 ± 11	0.092
Diagnosis motivation									
Self-conscious	494 (68%)	22 (48%)	0.005	13 (57%)	0.29	8 (50%)	0.15	2 (20%)	0.0016
Objective symptom	7 (1%)	17 (37%)	<0.0001	6 (26%)	<0.0001	7 (44%)	<0.0001	5 (50%)	<0.0001
Screening examination	134 (18%)	5 (11%)	0.2	2 (8%)	0.24	0	0.058	3 (30%)	0.32
Other	92 (13%)	2 (4.3%)	0.15	2 (8%)	0.57	1 (6%)	0.44	0	0.23

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