ORIGINAL

Prevalence of anxiety in women undergoing mammography

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Abstract

Objective: The aim of this study was to evaluate the frequency and possible causes of anxiety in women undergoing mammography and verify the impact of prior information as a tool to reduce anxiety. **Material and Methods:** The sample consisted of female patients who underwent mammography at an oncology reference center in Brazil. Total sample was divided into two groups and only one group received an explanatory folder with information regarding the mammography and its follow-up. All patients received a questionnaire containing demographic and clinical data, questions about the mammographic exam and the State-Trait Anxiety Inventory (STAI). **Results:** Two hundred and seventy-four patients were included, aged between 21 and 89 years. Exam purpose was screening in 48.3%. Self-perception of anxiety was reported in 52.2% and most frequent causes of anxiety referred by patients were worry over results (35.3%) and fear of having pain or discomfort during the procedure (26.6%). The levels of anxiety according to the STAI were moderate or high on 52.6% on the state component, and 82.1% on the trait component. There was no statistically significant difference on anxiety levels according to any of the demographic or clinical variables, or between patients who received and did not receive the educational folder prior to the exam. **Conclusion:** Anxiety is a common feature of women undergoing mammography, mainly caused by fear of the results and lack of knowledge of the exam. According to the results of this and other studies, there was no impact on reducing levels of anxiety with information measures immediately before the exam.

Keywords: anxiety, breast neoplasms, cancer screening, early detection of cancer, mammography.

INTRODUCTION

Breast cancer is the most common type of cancer and the second cause of death from cancer in women. Reduction in the mortality can be achieved through detection and treatment in early stages of the disease, where cure is possible[1-2]. Therefore, screening mammography is routinely used worldwide to provide early diagnosis in asymptomatic women. Moreover, diagnostic mammography is often the first exam indicated in patients with signs or symptoms suspected for breast cancer.

Anxiety and depression occur in patients with cancer and during cancer screening[3-6]. The prevalence of anxiety is high among patients awaiting diagnostic procedures such as mammography[7]. In this setting, patient's anxiety is often related to the anticipation of negative results and lack of knowledge of the method and how it diagnoses illness. High levels of anxiety and distress may lead to suboptimal examination or need to repeat the exam, besides it may cause poor adherence to the screening program[8-12].

The complexity of psychological conflicts related to the diagnosis of breast cancer involves the need for a mutilating breast operation, adverse effects of adjuvant therapy and the confrontation with a potentially lethal disease. Therefore, many times these patients need to maintain psychological follow-up[13-15].

Few studies have addressed the profile of patients that undergo screening or diagnostic mammography and the prevalence of anxiety in this population. The aim of this study was to evaluate the frequency and possible causes of anxiety in women undergoing mammography in an oncology reference center and verify the impact of prior information as a tool to reduce anxiety.

METHODS

The sample consisted of female patients who underwent mammography at Hospital A.C. Camargo, an oncology reference center in São Paulo, Brazil. This study was approved by the institution's Ethics Review Board and all patients who agreed to participate in the study signed an informed consent form. The eligibility criteria included age above 21 years and ability to understand and complete the self-administered questionnaire.

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All patients received a questionnaire containing demographic and clinical data, questions about the mammographic exam and State-Trait Anxiety Inventory (STAI). Demographic data included age, marital status, occupation, educational level and economic class according to the Brazilian Economic Classification of the National Association of Research Enterprises - ANEP[16]. Clinical data included personal or family history of breast cancer, invasive procedure and exam purpose (prevention, diagnosis, staging, treatment evaluation or follow-up). Further clinical data were collected from medical records. Questions about mammography assessed previous experience, causes of anxiety and how they would like to receive the results.

Patients in the sample were equally divided into two groups (A and B). Patients in group A received an explanatory folder which explained: what a mammography is; how the exam is performed; why breast compression is necessary; the importance to detect changes that allow for early diagnosis; the difference between the screening exam (performed in asymptomatic women) and diagnostic (for women who presented clinical findings); the tests that may be necessary to complement mammography (clinical examination, breast ultrasound, MRI and biopsy); radiological findings do not necessarily mean cancer because the majority of detected lesions are benign, and; when cancer is diagnosed and the most appropriate first treatment is given in each case, advances in medicine and the treatments available are crucial for healing. The folder was based on educational material already used in the institution, with simple and direct language, received by patients when they arrived in the waiting room for mammography, taking the time to read it and clarify any doubts with physicians of the sector. Patients in group B did not receive the explanatory folder.

The Portuguese version of the STAI was used to measure anxiety, which presented adequate psychometric properties for cancer patients, patients undergoing invasive radiological procedures and were both validated to the Brazilian population[17]. Spielberger et al. developed the STAI to evaluate two separate components of anxiety: temporary (state) and propensity (trait)[18]. State and trait anxiety was defined obtaining the score in each scale separately. The categories given by the total score are: 20-39 for low anxiety; 40-59 for moderate anxiety; and 60-80 for high anxiety. The mean score of the patients was also described with standard deviation (SD). For association analysis with the different variables, the threshold score of 40 was used. The analysis of the association between anxiety and demographic or clinical variables was made by the chi-square test. For all tests, an error $\alpha = 5\%$ was established.

RESULTS

From a total of 300 questionnaires delivered to patients, 274 were returned and considered valid. All patients were female, aged between 21 and 89 years (mean: 58 years). Other population characteristics are described in Table 1.

Table 1. Population characteristics.

Independent variable	Characteristic	%
Age	< 58 years	63.5
	≥ 58 years	36.5
Marital Status	With partner	64.6
	No partner	35.4
Job Situation	Employed	41.3
	No employed	58.7
Education Level	College Degree	43.0
	Completed High School	25.3
	< High School	31.7
Economic Class	A	20
	B	46.3
	C	24
	D + E	5.6
	No data	1.6
Exam Purpose	Screening	48.3
	Follow-up after treatment	28.6
	Diagnosis	16.3
	Staging	2.6
	Disease recurrence	2.6
	Treatment evaluation	1.6
Prior Invasive Procedure	Yes	11.6
	No	88.4
Prior Psychiatric Care	Yes	6.5
	No	93.5
Familiar History	Yes	34.3
	No	65,7
Prior diagnosis of breast cancer	Yes	3.6
	No	96.4

Exam purposes included screening in 48.3% of the patients, follow-up after treatment in 28.6%, diagnosis in 16.3%, staging in 2.6%, recurrence in 2.6% and treatment evaluation in 1.6%. Thirty-four patients (11.6%) have already been submitted to invasive image-guided diagnostic procedures, including fine needle aspiration, core or vacuum-assisted biopsies, and 3.6% were previously diagnosed with breast cancer.

Family history of breast cancer was related by 34.3% of the patients and 68.2% perceived that family history increases the risk of breast cancer. A minority of patients (6.5%) referred prior psychiatric care. Most patients have already been submitted to mammography (n = 248; 90.5%).

Self-perception of anxiety was reported in 52.2% of the patients. Most frequent causes of anxiety referred by patients were worry over results (35.3%), fear of having pain or discomfort during the procedure (26.6%), prolonged waiting time (17.3%) and unfamiliarity with the exam (15.6%). Most patients (46.6%) would like to receive the result immediately after exam, while 33.6% would receive the result later and

read the result without presence of the doctor, and 13.3% would like to receive the results in a return visit to the physician who requested the exam.

Figure 1 describes the levels of anxiety according to the STAI. On the state component, 47.4% had low anxiety, 52.2% moderate and 0.4% high. On the trait component, 17.9% had low anxiety, 81% moderate and 1.1% high.

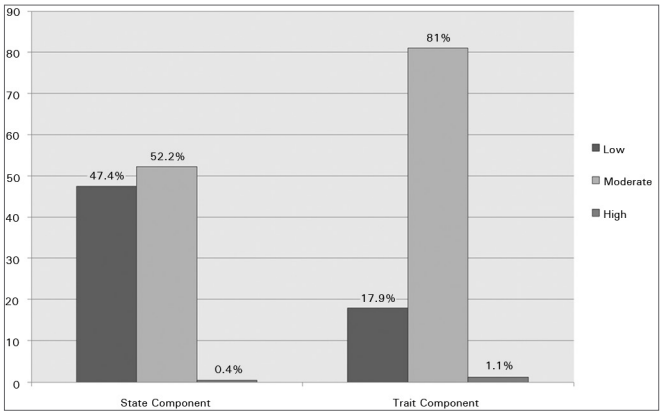

Figure 1. Prevalence of anxiety in women undergoing mammography as measured with the State-Trait Anxiety Inventory (STAI).

To facilitate statistical analysis, the small number of cases of high anxiety was grouped with cases of moderate anxiety for either state or trait components. There was no statistically significant difference on anxiety levels according to any of the demographic or clinical variables, including patients' age, marital status, job situation, educational level, economic class, family or personal history of breast cancer, prior invasive procedure, prior psychiatric care, exam purpose, previous mammography or self-perception of anxiety. There was also no statistically significant difference on anxiety levels between patients who received and who did not receive the educational folder prior to the exam.

DISCUSSION

Psychological distress occurs in patients with cancer and possible abnormalities detected on screening exams may also result in higher anxiety levels[3-6]. Few studies in the literature have evaluated these issues in women undergoing mammography or investigated the impact of providing information related to the exam on anxiety levels in this population.

Yu et al. found a high prevalence of anxiety among patients awaiting general diagnostic procedures and stated that there are two likely causes of anxiety experienced at a radiologic clinic. One is the lack of knowledge of the exam and fear of potential harm and the other is fear of cancer diagnosis, recurrence or failed treatment. These authors found a higher prevalence of anxiety among patients younger than 54 years-old, females, unemployed and with lower education, those with no previous experience of the upcoming procedure or whose exam purpose was diagnosis of cancer or treatment evaluation[7].

As described by other authors, we found that women undergoing mammography have a moderate level of anxiety. However, unlike previous studies, we did not find association between anxiety levels and any of the evaluated clinical and demographic variables, including educational level, family history of breast cancer or exam purpose[19-21]. Bolukbas et al.[20] showed statistically significant differences on anxiety levels for age at marriage, education level, status of doing breast self examination, information resources, knowledge about the illnesses that mammography detects and the number of mammograms.

It has been suggested that information given about mammography and follow-up for patients could reduce the psychological distress; however, an effective instrument for information has not yet been described. We evaluated the use of an explanatory folder previous to the procedure, which showed no impact on anxiety levels. Mainiero et al.[22] found that mammography-related anxiety levels about results were significantly higher than anxiety levels about the procedure. These authors showed no statically significant difference in mammography-related anxiety levels among women that watched an educational video or an entertaining movie in the waiting room before the procedure.

Anxiety is a common feature of women undergoing mammography, mainly caused by fear of the results and lack of knowledge of the exam. Some degree of anxiety should be expected due to the recognition of the importance and ability of mammography in the early diagnosis of breast cancer. However, it is important to recognize patients with high levels of anxiety and offer appropriate psychological support. According to the results of this and other studies, there was no impact on reducing levels of anxiety with information measures immediately before the exam. Thus, we believe that more effective educational tools should be developed, which may allow patients to react emotionally to the information received and reduce their levels of anxiety related to the procedure.

REFERENCES

1. Eddy DM, Hasselblad V, Mc Givney W, Hendee W. The value of mammography screening in women under 50 years. JAMA 1988;259:1512-9.
2. Elwood JM, Cox B, Richardson AK. The effectiveness of breast cancer screening by mammography in younger women. Online J Curr Clin Trials 1993;32.
3. Consedine NG, Magai C, Krivoshekova YS, Ryzewicz L, Neugut AI. Fear, anxiety, worry and breast cancer screening behavior: a critical review. Cancer Epidemiol Biomarkers Prev 2004;13:501-10.
4. Fajardo LL, Saint-Germain M, Meakem III TJ, Rose C, Hillman BJ. Factors influencing women to undergo screening mammography. Radiology 1992:184:59-63.
5. Jones RD. Depression and anxiety in oncology: the oncologist´s perspective. J Clin Psychiatry 2001;62(Suppl 8):52-5.

6. Miller EG, Luce MF, Kanh BE, Conant EF. The emotional cost of mammography efficacy. Avaiable from: <URL: https://marketing.wharton.upenn.edu/mktg/assets/File/marketing100.pdf > [2012 jul 10].
7. Yu LS, Chojniak R, Borba MA, Girão DS, Lourenço MT. Prevalence of anxiety in patients awaiting diagnostic procedures in an oncology center in Brazil. Psychooncology 2011;20:1242-5.
8. Rimer BK, Keintz MK, Kessler HB, Engstrom PF, Rosan JR.Why women resist screening mammography: patient-related barriers. Radiology 1989;172:243-6.
9. Mootz AN, Waldman HG, Evans WP, Peters GN, Kirk LM. Mammography in a mobile setting: remaining barriers. Radiology 1991;180:161-5.
10. Fawzy FI, Fawzy NW, Arndt LA, Pasnau RO. Critical review of physhosocial interventions in cancer care. Arch Gen Psychiatric 1995:52:100-13.
11. Roetzheim RG, Van Durme DJ, Brownlee HJ, Herold AH, Woodard LJ, Blair C. Barriers to screening among participants of a media-promoted breast cancer screening project. Cancer Detect Prev 1993;17:367-77.
12. Lerman C, Daly M, Sands C, Balshem A, Lustbader E, Heggan T, Goldstein L, James J, Engstrom P. Mammography adherence and psychological distress among women at risk for breast cancer. J Natl Cancer Inst 1993;85:1074-80.
13. Roberts CS, Cox CE, Reingstein DS, Baile WF, Gibertini M. Influence of physician communication on newly diagnosed breast patients´s psychologic adjustment and decision-making. Cancer 1994;74(1 Suppl):336-41.
14. Polednak AP, Lane DS, Burg MA. Risk perception, family history and breast cancer screening behavior. Cancer Detect Prev 1991:15:257-63.
15. Watson M, Haviland JS, Greer S, Davidson J, Bliss JM. Influence of psychological response on survival in breast cancer: a population-based cohort study. Lancet 1999;354:1331-6.
16. [ABEP] Associação Brasileira de Empresas de Pesquisa. Critério de Classificação Econômica Brasil 2003. Disponível em: <URL:http://www.abep.org/novo/FileGenerate.ashx?id=249> [2012 nov 12]
17. Biaggio AMB, Natalício L. Manual para o inventário de ansiedade traço-estado (IDATE). Rio de Janeiro: Centro de Psicologia Aplicada; 1979.)
18. Spielberger CD, Gorsuch RI, Lushene RE, Vagg PR, Jacobs GA. Manual for the state-trait anxiety inventory. California: Consulting Psychologists Press; 1983.
19. Rimer BK, Bluman LG. The psychosocial consequences of mammography. J Natl Cancer Inst Monogr 1997;(22):131-8.
20. Bölükbaş N, Erbil N, Kahraman AN. Determination of the anxiety level of women who present for mammography. Asian Pac J Cancer Prev 2010;11:495-8.
21. Brunton M, Jordan C, Campbell I. Anxiety before, during, and after participation in a population-based screening mammography programme in Waikato Province, New Zealand. New Zealand Med J 2005;118:U1299.
22. Mainiero MB, Schepps B, Clements NC, Bird CE. Mammography-related anxiety: effect of preprocedural patient education. Women's Health Issues 2001;11:110-5.