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GYNECOLOGIC ONCOLOGY

Treatment anxiety in breast cancer patients

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Abstract

Introduction The aim of the present study was to determine and evaluate the levels of anxiety of breast cancer patients according to the state of treatment, age and education level, as well as the anxiety potential of certain procedures during breast cancer treatment.

Method 148 breast cancer patients participated in this prospective cohort study and filled out the questionnaires including the Spielberger state-trait-anxiety-inventory, as well as questions based to stress triggering procedures during breast cancer therapy. The testing was accomplished with the Mann–Whitney *U* test, the significance level was set to 0.05.

Results Patients who appeared for tumor board decision showed the highest state-anxiety levels (55.79 SD ± 18.73) followed by patients undergoing surgery (50.24 SD ± 13.84). Patients already undergoing chemotherapy had lower state-anxiety levels than the group of all other patients ($p = 0.012$). Women undergoing chemotherapy showed lower anxiety levels relating to many procedures of breast cancer treatment. The 25% quartile of patients with the highest levels in the trait score showed a significant poorer education level ($p = 0.009$). Age showed no statistical influence on the anxiety level of breast cancer patients.

Conclusion Patients with probably high anxiety levels (younger age, low education level, and those appearing for frightening procedures) should receive extra careful clarification and treatment support such as a psycho-oncologist.

Keywords Treatment · Anxiety · Breast cancer · Chemotherapy

Introduction

Breast cancer is the most frequent malignant disease for women in Europe. In Germany for example almost 70,000 women get the diagnosis of breast cancer each year [20]. The overall 5-year survival rate is about 88% [2,20]. Even if the majority of breast cancer patients survives the disease, patients still have to overcome their fears and worries. This study's aim was to determine and evaluate the procedures and stages of the breast cancer treatment which are most frightening for patients. Besides a possible depression, which does have a incidence of 10–25% in breast cancer patients [6] treatment often comes along with psychological discomfort, fatigue [4] or nausea and vomiting [16], infertility, osteoporosis and side effects of anti-hormonal therapy [3].

The fear of developing a physical weakening, not to be able to manage daily live, to neglect social relationships and the fear of harming the family micro structure is of tremendous importance for patients [14]. Chemotherapy, radiation and mastectomy all three showed ubiquitously anxiety potential in previous studies. Lim et al. [13] showed that the most frightening point of chemotherapy was the first injection. Patients who underwent breast conserving therapy showed lower anxiety levels compared to those who underwent mastectomy.

Also previous chemotherapy influenced the level of fear for a second chemotherapy. Patients who already experienced one chemotherapy had a more positive attitude for the second one as those patients who never had chemotherapy before [9].

One third of all breast cancer patients are premenopausal [21]. Younger patients and those with a poorer education showed higher anxiety levels in previous studies [19]. Younger

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women with breast cancer seem to be especially vulnerable for emotional distress and psychological problems [21].

After treatment, 70% of the breast cancer patients are afraid of relapse of the disease [25] while in fact the breast cancer relapse rate is only 11% in the first 5 years and 20% within the next 10 years after completing therapy [1].

To understand, when during therapy patients are most afraid, is essential for oncologists to accompany patients with breast cancer when they need our support most.

Materials and methods

In this prospective cohort study in the time from August 2012 to September 2013 female breast cancer patients filled out a seven page long questionnaire including the Spielberger state-trait-anxiety-inventory (STAI) and questions based to stress triggering procedures during therapy. Questioning took place once in the course of the therapy at all stages: examination, before tumor board decision, before the operation, during chemotherapy, during radiation and at stage of follow-up screening. Patients with first diagnosis and patients with relapse or in a metastatic stage were included. The primary goal of this study was to evaluate the anxiety levels at certain stages of the breast cancer therapy. Second, it was to show if there is a difference in anxiety level due to age and education and if women who appeared to chemotherapy were showing different anxiety levels as the entirety of all other breast cancer patients. The institutional review board of the University Luebeck reviewed and monitored the study and granted full approval.

Questionnaires design

The questionnaire consisted of 7 pages and was build up as follows: the first and second page contained the description of the study and the confirmation sheet for data use and anonymity, followed by the page for biometric data, (age, stage of treatment, education and the family history). The next page asked for anxiety levels at different doctors such as general practitioner, dentist and gynecologist followed by the STAI state-trait-anxiety-inventory. The STAI developed by Spielberger et al. [22] was used in the German adapted version form [12].This test instrument asks for the momentary and general anxiety and is a common test instrument and often in use [10]. It is made out of a VAS 1–4 Likert scale and 40 items, by that the score range is 20–80 points, a value over 45 is highly anxious [23]. The mean value for the female German population is State 38.08 ± 10.29 and Trait 37.01 ± 09.95 [12]. The last page was a 25 items long questionnaire asking for the most common and possible anxiety/stress triggering procedures in breast cancer treatment in a common chronological order from diagnosis to surgery, chemotherapy and radiation in the form of a VAS Likert scale 1–4 (no anxiety to highest anxiety).

Statistical analyses

The descriptive variables were (mean, SD, median) as for the discrete variables (p values).The testing was accomplished with the Mann–Whitney U test, the significance level was set to 0,05. Data were analysed using SPSS, version 18 (SPSS Inc. Released 2009).

Results

148 Patients participated in the study with a mean age of 57 ± 13.2, one patient did not announce her age. The majority had a 6 year high school degree. Though the educational level of one patient was marked as “none”, there was no illiterate patient included. The status “none” is to be understood as a missing high school exam in this patient. Illiterates were not included in the study. 131 patients filled out the STAI test correctly and marked the stage of their treatment, the others either not gave information of the stage of their treatment or did not fill out the

Table 1 Age, education level, current treatment step and State Score of patients’ cohort

	Cohort		State score	
	Mean	*n*	Mean	*n*
Number of participants		148		
Age in years	57 ± 13.2	147		
Level of education[a]				
No statement		1		
None		1		
5 year high school degree		43		
6 year high school degree		64		
College degree		23		
University degree		16		
Stage of the breast cancer treatment				
No statement		11		11
Examination		20	40.21 ± 11.11	19
Surgery		32	50.24 ± 13.84	28
Tumor board decision		11	52.89 ± 18.73	11
Chemotherapy		43	40.64 ± 10.94	43
Radiation		3	42 ± 10.44	3
Follow up examination		28	47.99 ± 14.29	27

[a]German levels of education (kein Schulabschluss, Hauptschule, Realschule, Abitur, Hochschulstudium) originally asked were translated to fit American standard

STAI correctly or both. An overview of patients' characteristics is given in Table 1.

State anxiety: patients are most frightened before tumor board decision and surgery.

Patients waiting for the decision of the tumor board (52.89 ± 18.73) or the surgery (50.24 ± 13.84) scored highest of all patients in state anxiety. The lowest scores showed patients at medical appointment (40.21 ± 11.1) and at chemotherapy (40.64 ± 10.94), Fig. 1. No significant differences were shown in the state anxiety based on age.

Just the group of patients at chemotherapy showed a State-Score close to the average of German women and a significantly ($p = 0.012$) lower anxiety level as all other patients as one group together, Fig. 2.

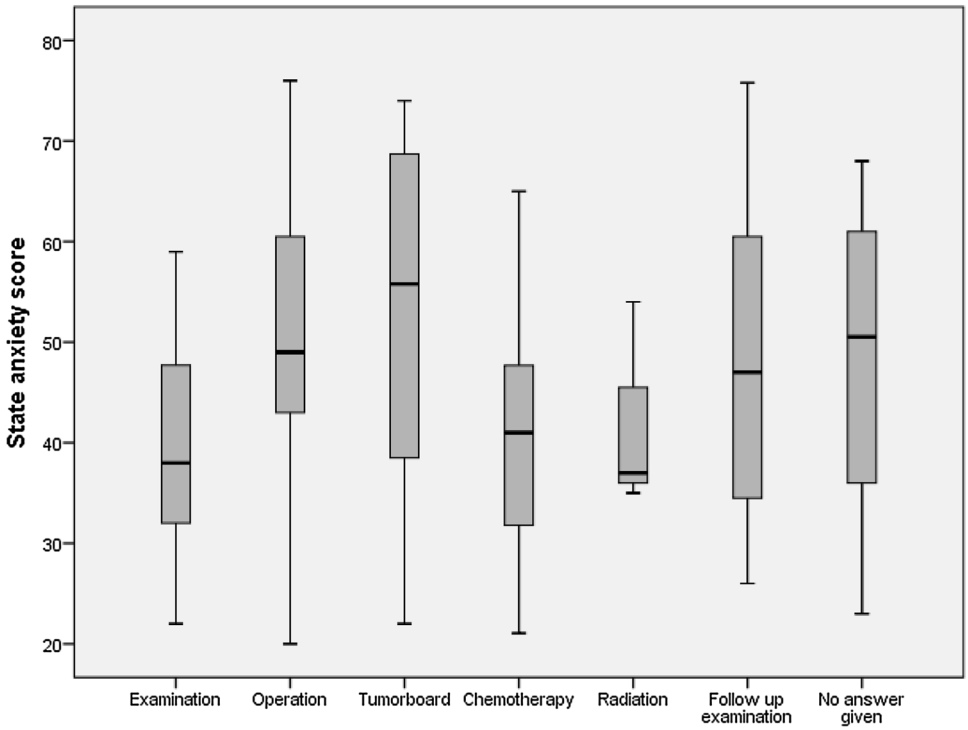

Fig. 1 State anxiety at various stages of breast cancer therapy

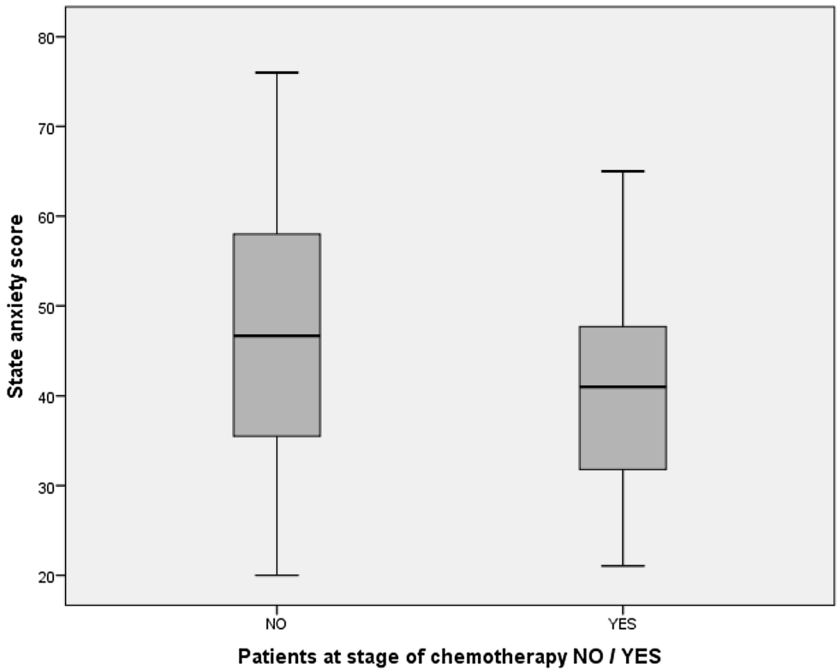

Fig. 2 Stage Anxiety of patients not at stage of chemotherapy treatment (also including patients pre and post chemotherapy) compared with patients under chemotherapy. The group of patients under chemotherapy showed significant lower anxiety levels ($p = 0.012$)

Trait anxiety: patients with lower education showed higher anxiety levels.

Referring to the quartiles which were build up, the 25% of women who scored highest in trait anxiety had a significant ($p = 0.009$) lower education level. No differences were found due to age.

Specific questionnaire: young patients show higher anxiety levels.

Based on all patients the procedures associated to chemotherapy showed the highest anxiety levels (Fig. 3). The questions that showed a mean over 2.5 in the specific questionnaire were again separated by age (Fig. 4). Patients between

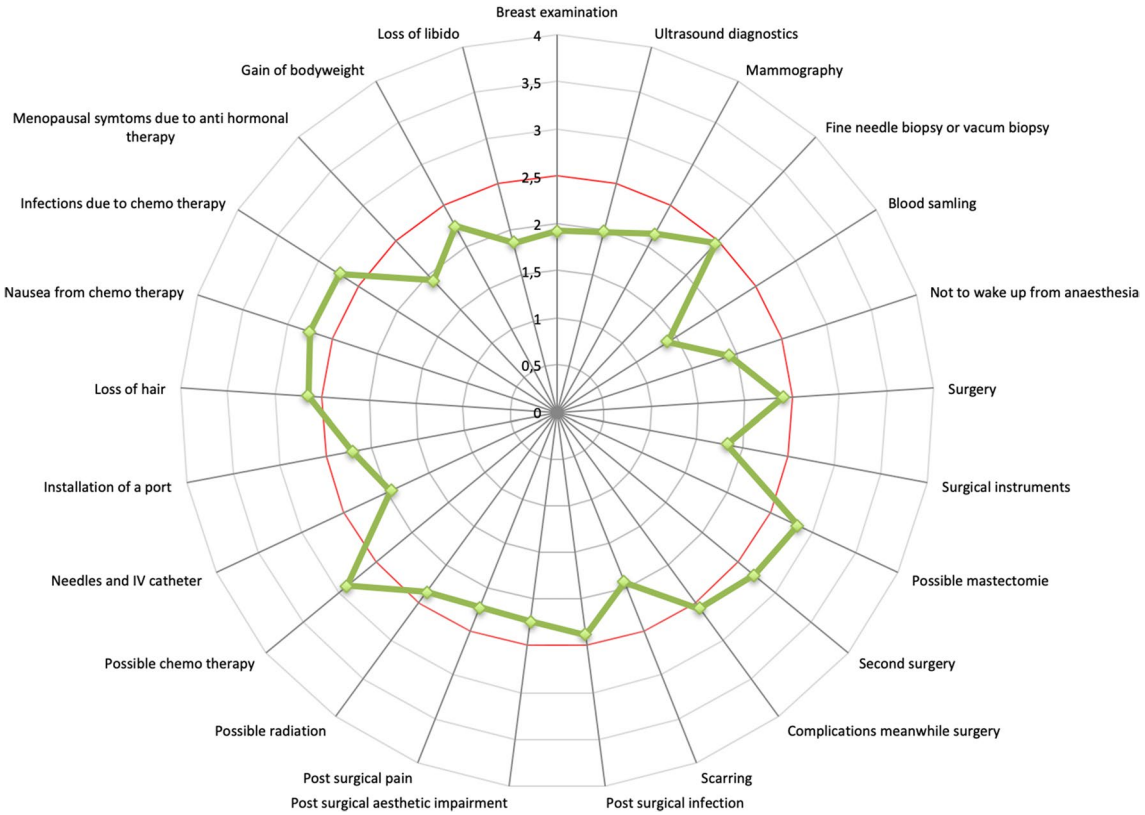

Fig. 3 25 items asked at the specific questionnaire. While patients show relatively low scores of anxiety for the loss of libido or menopausal symptoms under antihormonal therapy for example, they are much more frightened of mastectomy and chemotherapy

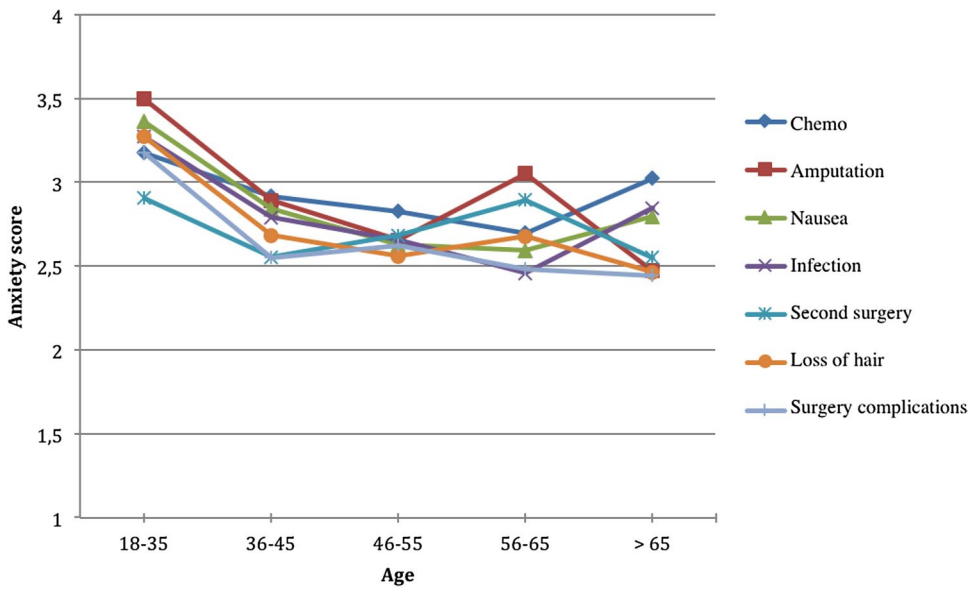

Fig. 4 Specific items scored in mean over 2.5, separated by age

Table 2 Significantly distinctive items between chemotherapy group and non chemotherapy group

Procedure	Mean anxiety levels		*p* value
	Chemotherapy		
	Yes	No	
Second surgery	2.43	2.81	0.028
Complications during surgery	2.26	2.68	0.023
Radiation	2.02	2.51	0.004
Possible chemo therapy	2.29	3.11	< 0.001
Implantation of a venous port system	1.86	2.38	0.005
Loss of hair	2.27	2.83	0.003
Nausea from chemo therapy	2.29	2.96	< 0.001
Infections due to chemo therapy	2.33	2.88	0.003
Loss of libido	1.6	2.0	0.01

18 and 35 years had the highest anxiety levels, patients between 45 and 55 years showed the lowest anxiety levels. The items from the specific questionnaire have been also tested between patients at stage of chemotherapy and those who are not. Nine out of 25 questions showed significant differences. All patients undergoing chemotherapy at the moment of evaluation showed lower anxiety levels than those who are not at chemotherapy, Table 2.

Patients already under chemotherapy show lowest anxiety level.

Patients already under chemotherapy who showed up for the next cycle of chemotherapy showed the lowest anxiety levels compared to patients at all other treatment steps. This was evident in the STAI level as well as in the specific questionnaire.

Discussion

Education

The 25% of women who scored highest in trait anxiety showed a significant ($p = 0.009$) lower education level. These findings are also shown in the study of Van Esch et al. [24] where women who scored higher than 44 in trait anxiety level had a poorer education and were at higher age. Osborne et al. [19] on the other hand showed as well that higher anxiety correlated with lower education but younger age.

Anxiety levels at certain steps of treatment

The decision of the tumor board was most frightening (average state anxiety 52,89) for the breast cancer patients in our study. In general this is the major decision step in breast cancer therapy. Will treatment be in curative or palliative setting? Will the patient be advised for chemotherapy or antihormonal treatment? The uncertainty is most incriminating. Galloway et al. [7] showed that there is a decrease of state anxiety as soon as a treatment plan is worked out for the patient. In that study the level of state anxiety was a predictor for the level of pain.

Surgery

The results of our study showed that upcoming surgery was correlated to high State-anxiety levels (average State anxiety 50.24). Surgery is in general a frightening event due to the surgery itself and the anesthesia [11]. Already a conversation about patients' fears and worries before surgery with the anesthetist can reduce anxiety [15].

It has been claimed that women undergoing mastectomy and breast reconstruction need more information how those operations effect their body imagine [19]. A handout with information can help increase satisfaction but do not effect anxiety [18]. Summarized a personal conversation is probably the more sufficient way of reducing anxiety, as it is possible to take direct reference to the patients fears.

Follow-up examination

The Follow-up examination was also a frightening appointment for the patients. Many patients fear that their recurrence of disease is detected or a failure of therapy. Herschbach et al. [8] showed that many patients suffer from FOP (fear of progression) and that this is one of the main reasons for distress of chronically ill patients.

Chemotherapy

Normally patients awaiting their first cycle of chemotherapy are very scared [14]. Overall participants of our study evaluated, chemotherapy, mastectomy, nausea and infections due to chemotherapy were most frightening for patients in our study.

On the contrary patients already under chemotherapy who came to an appointment for the next cycle showed significant less anxiety compared to patients at all other steps of treatment. Patients in our study received chemotherapy in a special setting. Chemotherapy was administered in a certain building called the chemotherapy-pavilion. This building sets a very comfortable environment surrounded by a park, with nice interior, lots of glass, a quiet and stress free atmosphere. Also the medical staff is consistent and patients get familiar to doctors and nurses. This constellation is rare in a complex treatment as breast cancer treatment, where

the patients are frequently exposed to new medical staff, environments and procedures.

In this group of patients already under chemotherapy there was even a significant loss of anxiety based on procedures not linked to chemotherapy as second surgery, radiation and surgery complications. One explanation for this effect could be that the expected very onerous chemotherapy has not turned out as onerous and critical as expected. Stress levels decrease quickly after starting chemotherapy. Good medical information and conversation in the form of a psychocognitive clarification is able to reduce the fear of breast cancer patients [5]. Additionally exercises such as PMRT (progressive muscle relaxation training) are able to reduce nausea and vomiting [17].

Limitations and BIAS

As the questionnaire was filled out on a voluntary basis, there might be a bias in the direction of women who are anyway open minded and willing to participate in a questionnaire.

Conclusion

According to the current study an anxiety adapted clarification should be aimed to patients with probably high anxiety levels (younger age, low education level, and those appearing for frightening procedures). As a major consequence of this survey we are optimizing the conditions for the patient collective at high anxiety risk (howsoever for all our patients). For example with extended clarification due to the schedule of the tumor therapy, extra careful and sensitive communication of any tumor board decision and looking after those patients which are at high risk form a demographic point of view (young age). As well as involving psycho-oncologist, if wanted by the patient. A general anxiety screening for our patients is not planned for now, as our study showed which procedures and patient characteristics most probably come along with high anxiety levels. The study showed that patients probably benefit most from a close doctor patient relationship, a stress less environment with a stable team and detailed as well as sensitive clarification of all procedures and the steps of therapy.

Compliance with ethical standards

Conflict of interest All authors declares that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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