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The impact of age on Health-Related Quality of Life (HRQoL) and symptoms among postmenopausal women with breast cancer receiving adjuvant chemotherapy

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Abstract

Background and purpose. Elderly women with breast cancer are often not given adjuvant chemotherapy (CT). One reason for this is that older women are believed to have more problems in tolerating side-effects of CT. The purpose of this study was to analyze the impact of age on health related quality of life (HRQoL) and symptoms in postmenopausal women with breast cancer undergoing adjuvant CT. *Patients and methods.* Eighty consecutive postmenopausal patients planned for CT were invited. Seventy-five agreed to participate (age 55–77 years). The patients completed two cancer-specific HRQoL questionnaires, The European Organisation for Research and Treatment of cancer (EORTC) EORTC-QLQ-C30, the EORTC-QLQ-BR23, and the Hospital Anxiety and Depression Scale (HADS) before, during, and 4 months after completion of treatment. The design was descriptional and longitudinal. Correlations were examined between age and change in HRQoL variables. *Results.* No significant correlations were found between age and any of the assessed HRQoL domains or symptom scales, except for dyspnoea and sexual functioning. Age was inversely correlated to change in dyspnoea from baseline through follow-up, whereas older women perceived their sexual functioning significantly lower at baseline. *Conclusion:* The results indicate that among postmenopausal patients in the age range 55–77 years consecutively selected for adjuvant CT age was not a predictor of decreased HRQoL. This supports the argument that age should not be used in isolation in decisions about adjuvant CT for breast cancer in elderly women.

Cancer treatment of the elderly patient is an increasingly important concern since the risk for developing breast cancer increases with age. Of the approximately 6 900 women who developed the disease in Sweden during 2004, about 65% were postmenopausal and about 30% were aged 70 or older [1]. The effects of adjuvant CT on the breast cancer disease seem to be as good for pre and postmenopausal patients, at least for the hormone receptor negative patients [2]. However, very few patients older than 70 years were included in the randomised studies [2].

In clinical practice, it is common that elderly women are offered less CT [3,4], because of the fear that they are less able to tolerate toxicity [5]. Nevertheless, some studies have shown that elderly patients tolerate standard chemotherapy regimes, and even more intensive regimes, almost as well as younger patients [6].

Another aspect highly important is quality of life. Most studies concerning this aspect have been performed on the younger and middle-aged patients. These studies have shown that the patients experience a number of different symptoms related to both the treatment and/or the disease [7,8]. These symptoms may also continue well after the treatment has ended [9], and can lead to decreased health-related quality of life (HRQoL) [10,11]. However, it is questionable whether findings from younger women can be accurately extrapolated to an elderly population [12]. A greater understanding of age-related differences in experienced HRQoL and symptoms, in conjunction with chemotherapy is

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therefore an important issue for clinicians in oncology care [13].

The purpose of this study was to analyze the impact of age on experienced HRQoL and symptoms in postmenopausal women with breast cancer before, during and 4 months after adjuvant CT. We defined HRQoL as a subjective perception of health, i.e. the impact of disease and treatment on health status (functions, symptoms and subjective well-being). This definition has also been advocated by the European Organisation for Research and Treatment of Cancer (EORTC) [14].

Material and methods

Sample and setting

The inclusion criteria for this study were: postmenopausal women aged 55 years and older newly diagnosed with histologically confirmed stage I to IIIa breast carcinomas, and able to give informed consent, read and speak Swedish, and understand the purpose of the study. Age 55 years or above was used to ensure that the women participating in the study were homogeneous with respect to postmenopause. The age range was 55–77 years. The exclusion criteria were: evidence of dementia, known history of psychiatric disorder, and history of other cancers within the previous five years. The participants were consecutively invited patients who after prior surgery were scheduled for adjuvant chemotherapy treatment (CT) at two university hospitals and one county hospital in Sweden. Chemotherapy was offered to all patients with hormone receptor-negative breast cancer and to high-risk hormone receptor-positive patients (i.e. tumor size $>$50mm and/or more than 3 positive lymph nodes). Many of the women also had the CT combined with RT (a 5-week radiotherapy course starting 3–4 weeks after CT), and/or endocrine therapy

Procedure

Data were collected from November 2003 to November 2005. Of 80 consecutive patients who met the inclusion criteria, only five refused participation (n = 75). The CT regimen was either flurouracil 600 mg/m^2 i.v., epirubicin 75 mg/m^2 i.v., and cyclophosphamide 600 mg/m^2 i.v., (FEC) every third week in a course of six treatments (n = 72,), or cyclophosphamide 100 mg/m^2 per orally on days 1–14 and methothrexate 40 mg/m^2 i.v., and flurouracil 600 mg/m^2 i.v. on days 1 and 8 (CMF) in a course of six treatments (n = 3).

A pilot study was performed with ten of the included 75 women about to receive CT in order to investigate whether there were any problems with the data collection method. No adjustments were found to be needed to the study design, instruments, or data collection procedure.

The baseline data were collected one week before treatment. The women from one of the university hospitals were interviewed and filled in the questionnaires either at the hospital or at home, whereas the women from the county hospital and the other university hospital were interviewed by telephone due to geographical distances. In the latter groups, questions and response choices were read to the women and their answers were filled in by the interviewer. At subsequent data collection points, i.e. one week after the first, third, and last cycles of chemotherapy, and at follow-up four months after the completion of treatment, all patients were mailed their questionnaires, together with an answer envelope and a letter explaining the procedures and providing the telephone number of the first author.

A total of 24% (n = 18, mean age 65 years) of the original CT sample (n = 75, mean age 62 years) did not answer the 4-month follow-up questionnaire. Of those lost to follow-up, of their own personal reasons withdrawn from adjuvant CT, seven patients (3 $<$65 years and 4 $\geq$65 years) withdrew during the six cycles due to various medical problems. The reasons were diverticulitis (n = 1), neutropenia (n = 2), and relapse (n = 2) pulmonary embolism (n = 1), and heart conditions (n = 1), and the remaining eight received all CT courses but did not return the surveys despite a letter of reminder.

Additionally, seven patients (2 $<$65 years and 5 $\geq$65 years) had a dose reduction due to low platelet count (n = 2), and neutropenia (n = 3) to rash (n = 1), nausea (n = 1).

Measures

Sociodemographic characteristics (e.g. marital status, education, work status, co-morbidities, and medication) were obtained through patient interviews and clinical variables (e.g. histopathology, surgery, stage) by review of medical records.

The core questionnaires used were the cancer-specific EORTC QLQ-C30 [15] and the tumour-specific breast cancer module EORTC QLQ-BR23 [16]. The reliability of the Swedish version has been assessed in both healthy individuals and different groups of cancer patients, with internal consistency (Cronbach's alpha) ranging from 0.55 to 0.87 [17].

The 14-item Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression [18]. Cronbach's alpha for the Swedish version of HADS is 0.84 for anxiety and 0.82 for depression [19].

Statistical analyses

For each patient and each HRQoL subscale a linear regression coefficient was calculated to describe the trend with time from baseline during treatment. Fisher's test for paired comparisons was used to test if the regression coefficients were significantly different from zero, i.e. if there were any trends with time from baseline during treatment. Differences between baseline and the mean of the first, third and the sixth cycle were calculated to elucidate the difference between baseline and treatment time. Differences between baseline and the 4-month follow-up were also calculated to elucidate the difference between baseline and follow-up. Correlations between age and the described differences were tested with Pitman's test [20]. Pitman's test, Fisher's permutation test or Kruskal-Wallis test, which all are non-parametric tests, were used to test for relations between age and sociodemographic as well as clinical variables (which of these tests that were used depended on type of variable tested). Patients with missing values on a variable were excluded from analyses in relation to that variable. All tests were two-tailed and conducted at 5% significance level.

Note that all tests were performed with age as a continuous variable, but for descriptive purposes Tables I–III and Figure 1 show data divided into a younger group (55–64 years; $n = 36$) and an older group (65+ years; $n = 39$). This age cut-off was chosen for two reasons: 1) Most clinical HRQoL studies of breast cancer have excluded those over 65 years; 2) it divides the total group approximately at the median. A separate analysis of drop-outs was performed to study whether these patients differed regarding age and baseline HRQoL.

Ethics

The Ethics Committees at Göteborg University and Stockholm University approved the study. All patients received oral and written information, and gave informed written consent before inclusion.

Results

Sociodemographic and clinical characteristics

Sociodemographic and clinical characteristics of the sample are presented in Table I. As expected, age was significantly related to retirement (Fisher's permutation test; $p < 0.001$) and level of education (Fisher's permutation test; $p < 0.05$). However, there were no significant differences in marital status due to age. The only co-morbidity related to age was cardiovascular disorders, which were more common among older (Fisher's permutation test; $p < 0.05$). Older women also used significantly more medication (data not shown; Fisher's permutation test; $p < 0.001$), particularly cardiovascular medication (data not shown; Fisher's permutation test; $p < 0.05$). The 18 (24%) patients that were lost to 4-month follow-up did not differ statistically from the total sample at baseline, and there was no significant correlation between age and completion of the follow-up questionnaire. The mean age of these 18 patients was 65 years and the range was 55–77 years.

HRQoL and symptom experience depending on age and over time

There was a significant decrease in global health status, body image (BR-23), physical-, role-, social- (all; Pitman's test; $p < 0.001$) and cognitive functioning (Pitman's test; $p < 0.05$) during the CT period for all women (Table II and Figure 1). These decreases, except for social and cognitive functioning, had not fully recovered to baseline levels 4 months after the end of CT. There was no significant change in future perspective, emotional and sexual functioning from baseline through the treatment period and to time of follow-up. The level of anxiety decreased for all women during treatment (Pitman's test; $p < 0.01$) and was significantly lower at time of follow-up (Pitman's test; $p < 0.001$) compared with baseline (Table III).

There were also significant increases in depression, upset by hair loss, systemic therapy side effects, nausea and vomiting, fatigue, dyspnoea, appetite loss (all; Pitman's test; $p < 0.001$), and pain (Pitman's test; $p < 0.01$) over the treatment period; whereas sleep, diarrhoea and financial difficulties did not change. These increased values had not fully recovered to baseline values at 4 months after the end of CT, except for nausea/ vomiting, appetite loss, constipation, and upset by hair loss. Sleep (Pitman's test; $p < 0.01$) and financial difficulties (Pitman's test; $p < 0.001$) were significantly worse at baseline. Breast and arm symptoms did not significantly change over the treatment period, but increased from baseline to time of follow-up (Pitman's test; $p < 0.001$ and $p < 0.01$, respectively).

There were no significant relationships between age and any of the HRQoL scales, expect for dyspnoea (Pitman's test; $p < 0.001$) and sexual functioning (Pitman's test; $p < 0.01$). Age was inversely related to worsening of dyspnoea over time, whereas perceived sexual functioning was lower at baseline for older women.

Table I. Sociodemographic and clinical characteristics of the sample, divided into younger patients (age 55–64) and older patients (age 65–77).

	Younger postmenopausal women n = 36 N (%)	Older postmenopausal women n = 39 N (%)
Demographic data		
Single, divorced or widowed	14 (39)	21 (54)
College/ graduate degree	23 (64)	15 (38)
Employed, full time or at least part time	26 (72)	2 (5)
Old age retirement	5 (14)	37 (95)
Swedish born	26 (72)	34 (87)
Comordbidities		
One co-morbidity	16 (44)	12 (31)
Two co-morbidities	6 (17)	13 (33)
Three or more co-morbidities	1 (3)	4 (10)
Cardiovascular disorders (e.g. high/low blood pressure, ischemic heart disease)	5 (14)	16 (41)
Musculo-skeletal problems (e.g. fibromyalgia, arthritis)	7 (19)	8 (20)
Respiratory problems (e.g. asthma, chronic obstruction)	3 (8)	2 (5)
Gastro-intestinal problems (e.g. diverticulitis)	2 (6)	2 (5)
Depression	3 (8)	4 (10)
Histopathology		
Invasive ductal CA	29 (81)	26 (67)
Invasive lobular	5 (14)	6 (15)
Other	2 (6)	6 (15)
Data missing		1 (3)
Surgery		
Total mastectomy	18 (50)	25 (64)
Sector resection	17 (47)	14 (36)
Data missing	1 (3)	–
Axillary exploration		
Axillary clearance	24 (67)	32 (82)
Sentinel node biopsy	13 (36)	10 (26)
Positive receptor status	17 (47)	17 (44)
Positive lymph nodes	20 (55)	26 (67)
Tumor size		
1–20 mm	15 (42)	13 (33)
21–50 mm	11 (31)	19 (49)
> 51 mm	7 (19)	6 (15)
Data missing	3 (8)	1 (3)
Treatment		
Chemotherapy (CT)	5 (14)	7 (18)
CT + Radiotherapy (RT)	14 (39)	12 (31)
CT + RT + Endocrine	15 (42)	18 (46)
CT + Endocrine	2 (6)	2 (5)
Stage		
Stage I	13 (36)	10 (26)
StageII	9 (25)	13 (33)
Stage III	12 (33)	15 (38)
Data missing	2 (6)	1 (3)

Discussion

Age did not seem to have an impact on changes in HRQoL during and after adjuvant CT in this study of 75 consecutively treated postmenopausal patients. The only variables significantly related with age were dyspnoea (worsening of symptoms was inversely related to age) and sexual functioning (older women had lower sexual functioning at baseline). Looking at HRQoL over time there was a significant decrease in global health status, body image, physical and role functioning during and after completed treatment, but the decrease was independent of age. These results indicate that concern about decrease in HRQoL would not alone be a reason not to consider CT among elderly.

Table II. Mean values (SD) of the EORTC QLQ-C30 scales, divided into younger patients (age 55–64) and older patients (age 65–77).

	Baseline M (SD)/n	First CT M (SD)/n	Third CT M (SD)/n	Sixth CT M (SD)[c]/n	4-month follow-up M (SD)[d]/n
Global health status/QoL[a]					
Younger	75 (18)/36	62 (23)/34	62 (23)/34	56 (22)/33	70 (22)/27
Older	76 (20)/39	64 (24)/37	60 (23)/35	61 (22)/32*** (−)	70 (24)/30* (−)
Functioning scales[a]					
Physical function					
Younger	92 (8)	85 (12)	80 (13)	79 (16)	82 (14)
Older	87 (17)	79 (20)	74 (20)	72 (20)*** (−)	79 (19)*** (−)
Role function					
Younger	82 (23)	64 (32)	57 (31)	52 (31)	76 (26)
Older	82 (23)	70 (27)	63 (32)	65 (27)*** (−)	70 (31)** (−)
Emotional function					
Younger	69 (21)	73 (26)	76 (18)	71 (19)	70 (25)
Older	73 (20)	78 (18)	77 (27)	78 (19)	82 (16)
Social function					
Younger	86 (23)	74 (28)	67 (30)	68 (31)	75 (27)
Older	87 (19)	75 (26)	72 (28)	73 (23)*** (−)	84 (22)
Cognitive function					
Younger	80 (23)	82 (21)	81 (19)	80 (21)	81 (19)
Older	86 (17)	85 (18)	84 (22)	81 (20)* (−)	88 (15)
Symptom scales[b]					
Nausea and vomiting					
Younger	2 (7)	16 (19)	21 (20)	13 (20)	1 (4)
Older	1 (6)	9 (14)	15 (19)	13 (15)*** (+)	3 (8)
Fatigue					
Younger	26 (19)	36 (20)	43 (25)	50 (23)	36 (24)
Older	21 (24)	36 (27)	43 (23)	42 (24)*** (+)	27 (26)** (+)
Pain					
Younger	8 (13)	18 (18)	17 (26)	17 (26)	22 (27)
Older	6 (13)	15 (22)	20 (27)	18 (24)** (+)	23 (27)*** (+)
Dyspnoea[e]					
Younger	5 (12)	18 (26)	27 (24)	27 (24)	18 (21)
Older	11 (21)	14 (29)	23 (31)	26 (26)*** (+)	16 (19)*** (+)
Sleep					
Younger	40 (43)	37 (35)	32 (27)	38 (31)	30 (25)
Older	44 (40)	42 (33)	34 (26)	37 (28)	25 (29)** (+)
Appetite loss					
Younger	5 (14)	16 (23)	23 (33)	15 (29)	4 (14)
Older	8 (18)	15 (26)	18 (29)	20 (25)*** (+)	9 (17)
Constipation					
Younger	4 (13)	22 (26)	31 (37)	26 (36)	9 (24)
Older	6 (18)	20 (28)	23 (28)	28 (32)*** (+)	7 (16)
Diarrhoea					
Younger	5 (18)	13 (23)	12 (24)	10 (23)	7 (23)
Older	3 (12)	14 (25)	14 (25)	11 (20)	4 (11)
Financial difficulties					
Younger	7 (18)	16 (26)	13 (25)	18 (30)	21 (32)
Older	7 (17)	8 (16)	9 (22)	11 (23)	12 (25)** (−)

* = significant time effect $p < 0.05$; ** = significant time effect $p < 0.01$; *** = significant time effect $p < 0.001$

[a]Higher scores indicate higher perceived quality of life and better functioning.

[b]Higher scores indicate more symptoms.

[c]Significances marked in the sixth column indicate significant changes (regressions) from baseline over the treatment period, irrespective of age.

[d]Significances marked in the seventh column indicate a significant difference between baseline and the 4-month follow-up, irrespective of age.

[e]Age was inversely related to worsening of dyspnoea over time (Pitman's test; $p < 0.001$).

(−) indicates a significant decrease in scores over time.

(+) indicates a significant increase in scores over time.

Note: all significance tests were performed with age as a continuous variable, but for descriptive purposes the table shows data divided into two age groups.

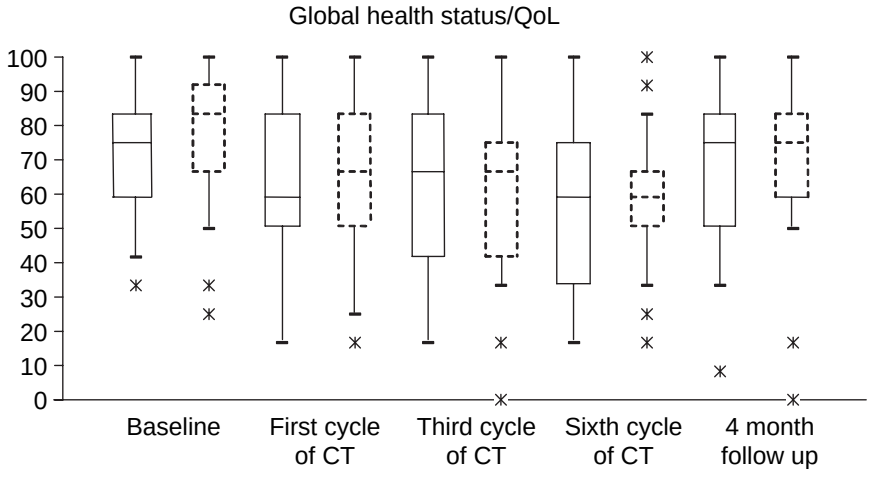

Figure 1. Box plots of Global health status/QoL from the EORTC QLQ-C30. Boxes with solid lines are younger patients (age 55–64) and boxes with dashed lines are older patients (age 65–77). The boxes indicate the interquartile range, the 25th to the 75th percentile.

However, the generalization of the results must be interpreted with caution since this is a hospital-based study with consecutively treated postmenopausal patients and we lack information about patients who were not referred for or not offered adjuvant CT, or who declined participation. Indeed, when we compared our study results with a healthy reference group from another study consisting of younger (40–49 years) and older women (70–79 years) [17], our older patients had significantly better physical functioning at baseline than did the older referents. But, in a comparison with a reference group of younger (31–64 years) and older (65–80 years) breast cancer patients [21], we found that our patients reported worse global health, role-, physical-, and emotional functioning (all $p < 0.05$) and more symptoms (e.g., nausea, fatigue, sleep and pain; all $p < 0.05$) during treatment. Comparison with reference groups from other studies must be interpreted with caution.

A surprising result was that age had no impact on declines in physical functioning during treatment. This may possibly reflect a difference in the health expectations of younger and older women, and discordance between their health expectations and current experience [22]. Individuals with high expectations of their health may experience substantial HRQoL impacts from a modest clinical condition, whereas those with lower expectations (e.g. older patients) may experience less deterioration in the same circumstances.

We also found that older women experienced more cardiovascular disorders. This result is consistent with the findings of Yanick et al. [12] that approximately 30% ($n = 319$) of those aged 65–69 years had one or more major co-morbidities. Co-morbidity and increased age are key considerations in offering systemic adjuvant treatment to older women, since they can minimize the potential benefit of any adjuvant therapy, and even increase the side effects of breast cancer treatment [5,12,23].

At 4-month follow-up, physical functioning had still not recovered to baseline levels and several symptoms were still prevalent. One reason for that may be the fact that almost all women had a 5-week radiotherapy course starting 3–4 weeks after CT, leaving a treatment-free interval of only 7 weeks before the 4-month follow-up. It is therefore important that more long-term follow-up studies should be conducted in order to see how adjuvant treatment affects HRQoL and experienced symptoms in the longer perspective.

Although patients generally reported less fatigue at 4 months follow-up compared to the last CT cycle, younger women in particular still felt fatigued. Some studies suggest that fatigue gradually decreases after the last treatment, but it is often seen as a frequent complaint in disease-free cancer patients up to months and even years after curative cancer treatment has ended [24,25]. In a recently published review by Ganz et al. [26] on fatigue in two survival populations, breast cancer and Hodgkin's disease the conclusion was that cancer-related fatigue persists long after cancer treatments end, and is associated with more intensive treatments (combined CT and RT) in these cancers. Research results on the relationship between age and fatigue are not consistent. In some studies age, as in the present one, is not related to fatigue levels [27], in others, older women experience more fatigue [28], and in yet other studies, younger patients experience more fatigue [29]. This inconsistency highlights the need for more research regarding the experience of fatigue in elderly cancer patients [24]. Since there are few studies that have focused solely on elderly cancer patients, the opportunity for comparison with other similar studies is limited. It is therefore of great

Table III. Mean values (SD) of the EORTC BR-23 and HAD scales, divided into younger patients (age 55–64) and older patients (age 65–77).

	Baseline M (SD)/n	First CT M (SD)/n	Third CT M (SD)/n	Sixth CT M (SD)[e]/n	4 month follow-up M (SD)[f]/n
BR-23 Functioning scales[a]					
Body image					
Younger	85 (22)/36	66 (34)/34	59 (36)/34	60 (33)/33	71 (27)/27
Older	95 (12)/39	84 (24)/37	76 (23)/35	73 (27)/ 32*** (−)	78 (26)/30*** (−)
Sexual functioning[b]					
Younger	17 (20)	16 (20)	12 (18)	12 (18)	17 (22)
Older	6 (13)	6 (12)	9 (15)	5 (10)	13 (15)
Sexual enjoyment					
Younger	89 (19)	61 (33)	48 (29)	44 (16)	55 (24)
Older	66 (00)	66 (27)	44 (17)	25 (16)** (−)	44 (16)
Future perspective					
Younger	60 (26)	49 (32)	49 (32)	49 (28)	49 (30)
Older	64 (21)	62 (27)	62 (30)	62 (28)	58 (29)
BR-23 Symptom scales[c]					
Systemic therapy side effects					
Younger	6 (5)	27 (19)	34 (17)	30 (17)	16 (10)
Older	7 (8)	23 (16)	35 (15)	36 (17)*** (+)	15 (16)*** (+)
Breast symptoms					
Younger	8 (9)	17 (13)	16 (15)	11 (13)	21 (17)
Older	10 (11)	17 (18)	14 (17)	16 (17)	19 (16)*** (+)
Arm symptoms					
Younger	9 (13)	13 (13)	10 (14)	8 (13)	17 (20)
Older	9 (11)	11 (17)	14 (21)	16 (22)	18 (22)** (+)
Upset by hair loss					
Younger	00 (00)	37 (42)	53 (44)	40 (45)	2 (13)
Older	00 (00)	32 (35)	45 (39)	43 (36)*** (+)	6 (22)
HAD scales[d]					
Anxiety					
Younger	7.86 (4.75)		5.35 (4.40)	5.48 (5.43)	4.77 (3.70)
Older	5.74 (4.87)		3.40 (3.29)	3.39 (4.17)** (−)	3.46 (4.40)*** (−)
Depression					
Younger	3.33 (3.27)		4.64 (3.50)	5.30 (4.11)	4.14 (3.47)
Older	2.38 (3.12)		3.62 (3.58)	4.03 (4.16)*** (+)	3.43 (3.70)* (+)

* = significant time effect $p < 0.05$; ** = significant time effect $p < 0.01$; *** = significant time effect $p < 0.001$.

[a]Higher scores represent better functioning.

[b]Sexual functioning was lower at baseline for older women (Pitman's test; $p < 0.01$).

[c]Higher scores represent more symptoms.

[d]Higher scores represent more anxiety and depression.

[e]Significances marked in the sixth column indicate significant changes (regressions) from baseline over the treatment period, irrespective of age.

[f]Signicances marked in the seventh column indicate a significant difference between baseline and the 4-month follow-up, irrespective of age.

(−) indicates a significant decrease in scores over time.

(+) indicates a significant increase in scores over time.

Note: all significance tests were performed with age as a continuous variable, but for descriptive purposes the table shows data divided into two age groups.

importance that more and larger comparative studies should be performed in this elderly population.

The strengths of the current study are the demographic and diagnostic homogeneity of the sample, the use of well-established self-report instruments, and the longitudinal design. This study does, however, have some limitations. Loss of patients to follow-up represents a common and serious threat to the internal validity of a study. The 24% of our patients who were lost to follow-up did not differ at baseline from those who continued, but they may have differed over the course of treatment, resulting in potential biases of the results. We found however no statistically significant correlation between age and questionnaire completion at follow-up, and those who were lost to follow-up were equally distributed in the younger and older age groups, as were those who withdrew during the 6-cycle

treatment program due to medical problems. However, older women were more prevalent (n = 5) among those who had a dose reduction during treatment (n = 7).

We also investigated whether or not the mode of questionnaire administration (personal interview at home/at hospital versus telephone interview) correlated to responded HRQoL. No significant differences were found (data not shown) between the modalities. The interview method did not either affect response rate.

Conclusions

In this study of postmenopausal patients with breast cancer consecutively treated with adjuvant CT, age was found to be unrelated to decreases in HRQoL and to the patterns of symptoms. The generalization of the results must be interpreted with caution since this is a selected hospital-based series of patients. This small piece gives further support to the argument that age should not be used in isolation in decisions about adjuvant CT for breast cancer in elderly women. However, further studies on harms and benefits of adjuvant CT among elderly breast cancer patients are needed.

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