RESEARCH ARTICLE

Comparison of Quality of Life of Turkish Breast Cancer Patients Receiving Breast Conserving Surgery or Modified Radical Mastectomy

Hande Acil[1], Ikbal Cavdar[2]*

Abstract

Purpose: The aim of this study was to investigate the differences in quality of life in patients who received breast conserving surgery (BCS) or modified radical mastectomy (MRM) for breast cancer. Materials and Methods: A total of 100 women with breast cancer who underwent either BCS or MRM between September 2011 and April 2012 at a private health center and completed their chemotherapy and radiation therapy cycles were included in the study. To assess the quality of life, we used a demographic questionnaire, the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the Quality of Life assessment in Breast Cancer (EORTC QLQ-BR23). Results: Using QLQ-C30, we found that patients who underwent BCS had better functional status and fewer symptoms than patients who underwent MRM. In QLQ-BR23, independent factors improving the functional scales were BCS, higher level of education and marital status (married); independent factors improving symptoms were BCS, higher level of education, younger age and low and normal body mass index (BMI). In QLQ-C30, independent factors affecting the functional and symptom scales were only BCS and higher level of education. Conclusions: We determined that patients who received BCS had better functional status and less frequent symptoms than patients who underwent MRM.

Keywords: Breast cancer - breast conserving surgery - modified radical mastectomy - quality of life - Turkey

Introduction

Breast cancer is an important global public health issue and is one of the most common cancer types in women (Zhang et al., 2013). It ranks the first among the ten most prevalent cancers in women in Turkey (Turkey's Statistical Yearbook, 2010) and it is reported as the second leading cause of death from cancer. Recent advances in the diagnosis and treatment of breast cancer allows for early detection and prolonged survival and thus brings up the issue of quality of life in patients with longer life expectancies. (Sert et al., 2013).

Five-year survival rates of patients with breast cancer regardless of stage are 73% in developed countries while it is only 53% in developing countries (Gencturk, 2013). Survival rates with BCS are similar to mastectomy (Ozmen, 2012; Abdullah et al., 2013). Survival rates of breast cancer have been increasing. However this affects the individuals in physical, psychological and social aspects in both positive and negative ways and the problems that the patients continue to experience become the most important factor determining the decrease in quality of life (Inan and Ustun, 2013).

Many studies have shown that women who are of younger age and have poorer health status at the time of diagnosis experience worse symptoms and this has a negative impact on their quality of life. (Janz et al., 2007; Cleeland, 2007; Leak et al., 2008; Kim et al., 2009; Dodd et al., 2010).

Quality of life depends on the functional health state of the individual, pain level, self-attribution, self-perception and quality of interaction with their surrounding environment (Mohammadi et al., 2013). Importance of breast cancer in quality of life studies is growing both because it is the most prevalent cancer among women and loss of breast has a major effect on patient's identity (Demirci, 2010).

In this study, we aim to investigate the differences in quality of life in patients who received breast conserving surgery (BCS) of modified radical mastectomy (MRM) for breast cancer.

Materials and Methods

Written permission of Istanbul University Istanbul Faculty of Medicine Clinical Studies Ethical Board was obtained prior to the beginning of the study (Date/number 2011/1248-651). Written permission of the private

[1]*Surgical Nursing Department, School of Health, Sakarya University, Sakarya,* [2]*Surgical Nursing Department Florence Nightingale Faculty of Nursing, Istanbul University Istanbul, Turkey* *For correspondence: ikbalcavdar@gmail.com*

Hande Acil and Ikbal Cavdar

health center, where the study was to be conducted at, was also obtained. 100 women with breast cancer who received either BCS or MRM by a single surgeon between September 2011 and April 2012 at a private health center and completed their chemotherapy and radiation therapy cycles were included in the study.

A demographic questionnaire (including age, sex, marital status, education, occupation, age of menarche, alcohol use and smoking, family history of breast cancer and the type of surgery performed), the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the Quality of Life assessments in Breast Cancer (EORTC QLQ-BR23) quality of life scales were used in the study.

EORTC QLQ-C30 and EORTC QLQ-BR23 Quality of Life Scale

Beser and Öz conducted the content validity and reliability studies of EORTC QLQ-C30 quality of life scale in Turkey and found the Cronbach alpha coefficient (r) to be 0,9014. EORTC QLQC30 Version 3.0 is a quality of life scale commonly used in patients with cancer worldwide (Beser and Oz, 2003; Ertem et al., 2009).

Breast cancer-specific EORTC QLQ- BR23 consists of 23 items and two subgroups, which are function and symptom scales. The higher scores in function scale represent better health status while higher scores symptom scale indicate more symptoms (Demirci, 2010; Demirci et al., 2011).

Evaluation-Statistical analysis

SPSS (Statistical Package for Social Sciences) for Windows 17.0 was used for the statistical analysis of the data. Demographics of the patients were given as number, percentage and mean value. Mann Whitney U analysis, Pearson and Fisher's Exact Test was used

Table 1. Demographic Characteristics of the Subjects (n=100)

Characteristics	All n	All %	BCS n	BCS %	MRM n	MRM %	X^2	p
Age(Mean±SD)	51,83±9,26(34-76)		52,34±9,36		51,32±9,23		0.000	1.000
≤50	49	49	25	50.0	24	48.0		
>50	51	51	25	50.0	26	52.0		
Marital Status							a	0.005
Married	80	80	34	68.0	46	92.0		
Single	20	20	16	32.0	4	8.0		
Education							18.482	<0.001
Primary school	57	57	18	36.0	39	78.0		
High school	19	19	13	26.0	6	12.0		
University	24	24	19	38.0	5	10.0		
Occupation							10.872	0.012
Housewife	75	75	31	62.0	44	88.0		
Office worker	7	7	5	10.0	2	4.0		
Retired	12	12	8	16.0	4	8.0		
Self-employment	6	6	6	12.0	0	0.0		
Income level							0.457	0.796
Low	20	20	10	20.0	10	20.0		
Middle	70	70	36	72.0	34	68.0		
High	10	10	4	8.0	6	12.0		
Social security							a	1.000
Yes	98	98	49	98.0	49	98.0		
No	2	2	1	2.0	1	2.0		
Living							a	0.056
Alone	5	5	5	10.0	0	0.0		
With family	95	95	45	90.0	50	100.0		
Age of Menarche(Median)	13(10-17)		13(10-16)		14(12-17)		a	0.023
≤12	20	20	15	30.0	5	10.0		
>12	80	80	35	70.0	45	90.0		
Menopausal Status							0.382	0.537
Premenopause	62	62	29	58.0	33	66.0		
Postmenopause	38	38	21	42.0	17	34.0		
BMI(kg/m²)(Median)	27,09(20-38)		26,48(20-38)		28,18(23-36)		3.086	0.214
Normal	30	30	19	38.0	11	22.0		
Overweight	42	42	19	38.0	23	46.0		
Obese	28	28	12	24.0	16	32.0		
Smoking							a	0.715
Yes	8	8	5	10.0	3	6.0		
No	92	92	45	90.0	47	94.0		
Alcohol							a	0.071
Yes	13	13	10	20.0	3	6.0		
No	87	87	40	80.0	47	94.0		

SD: Standart deviation; X²=Chi-Square Test(a=Fisher's Exact Test)

to determine whether the results of EORTC QLQ-C30 and EORTC QLQ-BR23 scales showed any difference depending on the type of surgical intervention. Multiple Linear Regression Model (method: stepwise) was used to determine the independent factors affecting the functional and symptom scales in both QLQ-C30 and QLQ-BR23. Results were evaluated with 95% confidence interval and $p < 0.05$ significance level.

Results

In this study, we evaluated 100 patients with breast cancer. Mean age was 51.83±9.26 (Range: 34-76). 80%

of the subjects were married and the ratio of married subjects in the MRM group was significantly higher than the BCS group. Subjects whose level of education was primary school constituted 36% in the BCS group while this ratio was as high as 78% in the MRM group and the difference was statistically significant. 75% were housewives, 70% had middle income level, 98% had social security from Social Insurances Institution, 95% lived with their families, age of menarche of 20% was equal to and below 12 years. 38% were in menopause, 42% were overweight, 92% were non-smokers and 87% did not consume alcohol (Table 1).

Data of the patients who did not receive any treatment and were only followed-up by their physician while the study was being conducted are given in Table 2. The analysis of the results of QLQ-C30 based on the type of surgical intervention revealed that when compared to MRM, patients who received BCS had better functional status and fewer symptoms. The results were statistically significant ($p < 0.05$).

The analysis of the results of QLQ-BR23 based on the type of surgery showed that body image, future

Table 2. Mean Scores in QLQ-C30 Scale Based on the Type of Surgical Intervention (n=100)

Functional Scales	Surgery	n	Mean	SD	z^a	P
Physical functioning	BCS	50	82.67	16.71	-5.148	<0.001*
	MRM	50	57.07	24.73		
Emotional functioning	BCS	50	76.83	21.45	-4.158	<0.001*
	MRM	50	53.17	28.52		
Role functioning	BCS	50	94.00	13.37	-6.195	<0.001*
	MRM	50	63.67	24.67		
Cognitive functioning	BCS	50	81.33	22.75	-5.045	<0.001*
	MRM	50	54.00	24.41		
Social functioning	BCS	50	88.67	21.15	-5.121	<0.001*
	MRM	50	57.00	31.96		
Global health status	BCS	50	68.33	18.90	-4.325	<0.001*
	MRM	50	46.17	27.31		
Symptom Scales	Surgery	n	Mean	SD	z^a	P
Pain	BCS	50	19.00	22.34	-5.351	<0.001*
	MRM	50	54.00	31.33		
Nausea and vomiting	BCS	50	5.67	16.36	-5.402	<0.001*
	MRM	50	40.67	36.60		
Fatigue	BCS	50	23.55	16.74	-5.733	<0.001*
	MRM	50	56.22	28.70		
Dyspnea	BCS	50	6.00	16.06	-5.704	<0.001*
	MRM	50	33.33	26.08		
Insomnia	BCS	50	26.00	33.87	-4.019	<0.001*
	MRM	50	54.00	32.92		
Appetite loss	BCS	50	4.00	12.85	-5.929	<0.001*
	MRM	50	46.00	40.34		
Constipation	BCS	50	19.33	30.18	-4.045	<0.001*
	MRM	50	39.33	26.68		
Diarrhoea	BCS	50	1.33	6.60	-6.427	<0.001*
	MRM	50	28.00	24.62		
Financial difficulties	BCS	50	12.67	23.22	-5.718	<0.001*
	MRM	50	44.67	27.45		

^{a}= Mann Whitney U test; *=p<0.001; BCS: Breast Conserving Surgery; MRM: Modified Radical Mastectomy

Table 3. Mean scores in QLQ-BR23 Scale Based on the Type of Surgical Intervention (n=100)

Functional Scales	Surgery	n	Mean	SD	z^a	P
Body image	BCS	50	88.00	20.63	-5.726	<0.001*
	MRM	50	51.50	32.89		
Future perspective	BCS	50	70.00	29.55	-4.128	<0.001*
	MRM	50	41.33	34.05		
Sexual functioning	BCS	50	19.67	23.50	-2.17	0.030**
	MRM	50	9.00	13.56		
Sexual enjoyment	BCS	50	32.22	29.67	-1.281	0.2
	MRM	50	16.67	28.33		
Symptom Scales	Surgery	n	Mean	SD	z^a	P
Systemic therapy side effects						
	BCS	50	21.42	15.63	-5.489	<0.001*
	MRM	50	48.55	24.18		
Breast symptoms	BCS	50	18.00	19.15	-4.523	<0.001*
	MRM	50	37.83	22.09		
Arm symptoms	BCS	50	18.89	21.79	-3.981	<0.001*
	MRM	50	37.33	23.52		
Hair loss	BCS	50	35.55	36.66	-4.254	<0.001*
	MRM	50	87.04	25.55		

^{a}= Mann Whitney U test; BCS:Breast Conserving Surgery MRM:Modified Radical Mastectomy; *=p<0.001;**=p<0.05

Table 4. Factors Affecting the Functional Scales and Symptom Scales (QLQ-BR23 scale)

Factors	B	SE.	Beta	t	p
(Constant)	68.090	10.806		6.301	0.000
Type of surgery (BCS)	21.457	3.581	0.543	5.992	0.000
Level of education (High school and University)	8.418	3.476	0.211	2.422	0.017
Marital status (Married)	8.476	4.084	0.172	2.075	0.041

*Dependent Variable: Functional State (QLQ-BR23);F=21,505; p=<0.001;R²=0.402; Multiple linear regression model (Method:Stepwise)

Factors	B	SE.	Beta	t	p
(Constant)	22.619	21.883		1.034	0.304
Type of surgery (BCS)	-20.082	4.339	-0.389	-4.628	0.000
Level of education (High school and University)	-16.610	4.536	-0.319	-3.662	0.000
Age	-0.574	0.220	-0.205	-2.605	0.011
BMI	1.188	0.551	0.175	2.154	0.034

*Dependent Variable: Symptoms (QLQ-BR23);F=20,519; p=<0.001; R²=0.464; Multiple linear regression model (Method:Stepwise)

Table 5. Factors Affecting the Functional Scales and Symptom Scales (QLQ-C30)

Factors	B	SE.	Beta	t	p
(Constant)	82.839	10.214		8.110	0.000
Type of surgery (BCS)	21.508	4.044	0.464	5.318	0.000
Level of education (High school and University)	12.586	4.084	0.269	3.082	0.003

Dependent Variable: Functional State (QLQ-C30);F=31,512;p=<0.001;R²=0.394; Multiple linear regression model (Method:Stepwise)

Factors	B	SE.	Beta	t	p
(Constant)	3.332	10.445		0.319	0.750
Type of surgery (BCS)	-26.634	4.136	-0.543	-6.440	0.000
Level of education (High school and University)	-10.308	4.177	-0.208	-2.468	0.015

Dependent Variable: Symptoms (QLQ-C30); F=37,220; p=<0001; R²=0.434; Multiple linear regression model (Method:Stepwise)

perspective, sexual functioning (functional state); systemic therapy side effects, breast symptoms, arm symptoms and hair loss (symptoms) were significantly different (p<0.05) (Table 3).

According to the Multiple Linear Regression Model (stepwise method) analysis, in QLQ-BR23 scale, independent factors improving the functional scales were BCS, higher level of education and marital status (married) (p<0.001); independent factors improving symptoms were BCS, higher level of education, younger age and low and normal body mass index (BMI) (p<0.05) (Table 4). In QLQ-C30 scale, independent factors affecting the functional and symptom scales were only BCS and higher level of education (p<0.05) (Table 5).

Discussion

Loss of breast, which is of great importance for female sexuality, body image and reproductivity, disrupts the bio-psycho-social balance, causes related problems and therefore affects the quality of life of the patients with breast cancer (Akyolcu, 2008). Patients who receive surgical intervention for breast cancer encounter many physical, psychological and social problems which in turn affect their quality of life negatively (Demir, 2008).

Surgical intervention, which has an important role in the treatment of breast cancer, affects the body image, self-confidence, psychological status, sexual life and interpersonal relationships of the patient negatively (Ozkan and Alcalar, 2009). Mastectomy may result in pain, depression, anxiety, fear, rage and other affective disorders, fatigue, loss of sexual desire, low self-esteem, social withdrawal, fear of losing femininity, worrying about disease recurrence, trouble finding appropriate clothing, and problems related to breast implants as well as a distorted body image and cause problems in the marriage and intimate relationships of the patients (Okanli and Ekinci, 2008; Karamanoglu and Ozer, 2008). Zanapalioglu et al. (2009) found better body image, sexual function, sexual satisfaction, future perspective, and arm and breast symptoms in patients who received BCS than patients who received MRM. In a similar study, body image, future perspective, arm symptoms and hair loss was worse in patients who received MRM while there was no difference in systemic therapy side effects and breast symptoms between BCS and MRM groups (Akca, 2011). Kement et al. (2011) reported better quality of life both physically and

mentally in patients who received BCS. In similar studies comparing BCS and MRM, Han et al. (2010) showed higher physical and mental status in BCS patients while Arndt et al. (2008) reported better physical and social functioning and general quality of life. Bulotiene et al. (2005) found higher role functioning in young women and higher social functioning in retired women in post-BCS period when compared to MRM. Zanapalioglu et al. (2009) found general well-being, physical symptoms, role performance, emotional state, cognitive state, social state, fatigue, nausea, dyspnea, sleep disorders, anorexia, constipation, diarrhea and financial problem points to be better in subjects receiving BCS. Hadi et al. (2012) found better global health and role functioning in subjects receiving BCS and more fatigue, nausea, vomiting, pain, dyspnea, lack of sleep and arm symptoms in patients who underwent MRM. Akca (2011) reported that patients who receive BCS or simple mastectomy for breast cancer have higher quality of life in terms of social function, fatigue, constipation and general quality of life in comparison to MRM. On the other hand, He and his colleagues reported significantly higher social functioning in patients who received BCS while there was no difference in physical, functional and emotional functioning between two groups (He et al., 2012).

In this study, we found quality of life to be better in patients who received BCS when comparing types of surgical intervention with both QLQ-C30 and QLQ-BR23. Similar to the results of other studies, BCS was found to be a positive factor affecting the functional and symptom scales in both scales and patients who received BCS had better functional state and less symptoms.

Kizilci (1999) and Ertem et al. (2009) reported that level of education affects the quality of life and subjects with higher education have better quality of life (Kizilci, 1999; Ertem et al., 2009). Similarly, in this study we found higher level of education to be a factor positively influencing the functional state and symptoms in both QLQ-BR23 and QLQ-C30 scales.

There are various opinions regarding the effect of marital status on quality of life. Kizilci (1999) suggests that marital status does not influence quality of life. Moro-Valdezate et al. (2012) reports that being married negatively affects the quality of life while on the other hand, Ertem and his colleagues propose that quality of life of married individuals have a better quality of life (Ertem et al., 2009). Our results were similar to the study

by Ertem and his colleagues being married was found to be a positive factor affecting the quality of life in QLQ-BR23 scale.

Overweight and obese women have a higher risk of experiencing treatment-related symptoms. High BMI in patients with breast cancer has been showed to be related to worse quality of life before, during and after radiation therapy and BMI was significantly correlated to symptoms (Fang et al., 2013). Similarly, we found low and normal BMI to be a factor decreasing symptoms according to QLQ-BR23 scale.

In conclusion, we determined that patients who receive BCS have better quality of life than patients who receive MRM.

Acknowledgements

References

Abdullah A, Abdullah KL, Yip CH, et al (2013). The decision-making journey of Malaysian women with early breast cancer: A qualitative study. *Asian Pac J Cancer Prev*, **14**, 7143-7.

Akca M (2011). The effects of treatment on psychosocial and sexual life as well as on quality of life in patients with breast cancer who underwent to surgical therapy. Mersin. T.C. Mersin University Faculty of Medicine, Department of Internal Medical Sciences. Expertise thesis.

Akyolcu N (2008). Sexual life after surgery in breast cancer. *The Journal of Breast Health*, **4**, 77-83.

Arndt V, Stegmaier C, Ziegler H, Brenner H (2008). Quality of life over 5 years in women with breast cancer after breast-conserving therapy versus mastectomy: A population-based study. *J Cancer Res Clin Oncol*, **134**, 1311-8.

Beser NG, Oz F (2003). Anxiety-depression levels and quality of life in patients with lymphoma receiving chemotherapy. *J Cumhuriyet University School of Nursing*, **7**, 47-58.

Bulotiene G, Ostapenko V, Veseliunas J (2005). Influence of social factors on the quality of life after cancer surgical treatment. *Acta Medica Lituanica*, **12**, 79-83.

Cleeland CS (2007). Symptom burden: Multiple symptoms and their impact as patient-reported outcomes. *J Natl Cancer Inst Monogr*, **37**, 16-21.

Demir SG (2008). Self-management of lymphedema in patients operated on for breast cancer. *J Breast Health*, **4**, 62-9.

Demirci S (2010). Breast cancer and quality of life. 3rd National Congress of Quality of Life in Health.

Demirci S, Eser E, Ozsaran Z, et al (2011).Validation of the Turkish versions of EORTC QLQ-C30 and BR23 modules in breast cancer patients. *Asian Pacific J Cancer Prev*, **12**, 1283-7.

Dodd MJ, Cho MH, Cooper BA, Miaskowski C (2010). The effect of symptom clusters on functional status and quality of life in women with breast cancer. *Eur J Oncol Nurs*, **14**, 101-10.

Ertem G, Kalkim A, Bulut S, Sevil U (2009). Quality of life and needs towards home care of patients treated with radiotherapy. *J Maltepe University Nursing Science and Art*, **2**, 3-12.

Fang P, Tan KS, Troxel AB, et al (2013). High body mass index is associated with worse quality of life in breast cancer patients receiving radiotherapy. *Breast Cancer Res Treat*, **141**, 125-33.

Gencturk N (2013). The status of knowledge and practice of early diagnosis methods for breast cancer by women healthcare professionals. *J Breast Health*, **9**, 5-9.

Hadi N, Soltanipour S, Talei A (2012). Impact of modified radical mastectomy on health-related quality of life in women with early stage breast cancer. *Arch Iranian Medicine*, **15**, 504-7.

Han J, Grothuesmann D, Neises M, Hille U, Hillemanns P (2010). Quality of life and satisfaction after breast cancer operation. *Arch Gynecol Obstet*, **282**, 75-82.

He ZY, Tong Q, Wu SG, et al (2012). A comparison of quality of life and satisfaction of women with early-stage breast cancer treated with breast conserving therapy v.s. mastectomy. İn Southern China. *Support Care Cancer*, **20**, 2441-9.

Health Ministry of Turkish Republic, Health Statistics Yearbook (2010) Refik Saydam Hygiene Center Presidency School Of Public Health.

Inan FS, Ustun B (2013). Biopsychosocial changes in post-treatment period of breast cancer. *J Breast Health*, **9**, 48-51.

Janz NK, Mujahid M, Chung LK, et al (2007). Symptom experience and quality of life of women following breast cancer treatment. *J Womens Health*, **16**, 1348-61.

Karamanoglu AY, Ozer FG (2008). Home care for mastectomy patients. *J Breast Health*, **4**, 3-8.

Kement M, Gezen C, Asik A, et al (2011). Breast conserving surgery and modified radical mastectomy in Turkish women with breast cancer: A prospective analysis of quality of life. *Turkiye Klinikleri J Med Sci*, **31**, 1377-84.

Kizilci S. (1999). The factors effected quality of life of people with cancer and their relatives. *J Cumhuriyet University School of Nursing*, **3**, 18-26.

Kim E, Jahan T, Aouizerat BE, et al (2009). Changes in symptom clusters in patients undergoing radiation therapy. *Support Care Cancer*, **17**, 1383-90.

Leak A, Hu J, King CR (2008). Symptom distress, spirituality and quality of life in African. American breast cancer survivors. *Cancer Nurs*, **31**, 15-21.

Mohammadi S, Sulaiman S, Koon PB, Amani R, Hosseini SM. (2013). Association of nutritional status with quality of life in breast cancer survivors *Asian Pac J Cancer Prev*, **14**, 7749-55.

Moro-Valdezate D, Buch-Villa E, Peiro S, et al (2012). Factors associated with health-related quality of life in a cohort of Spanish breast cancer patients. *Breast Cancer*, **21**, 442–52.

Okanli A, Ekinci M (2008). The comparison of marital adjustment, emotional control level and life satisfaction of the patients with breast cancer and their husbands after and before mastectomy, *New Symposium Journal*, **46**, 9-14.

Ozkan S, Alcalar N (2009). Psychological reactions to surgical treatment in breast cancer. *J Breast Health*, **5**, 60-4.

Ozmen V (2012). Surgical treatment of early stage breast cancer. eds muslumanoglu, m. federation of breast diseases societies (fbds) book of breast diseases. Güneş Medical Publishers, Ankara, 351-66.

Sert F, Ozsaran Z, Eser E, et al (2013). Quality of life assessment of applied therapy to breast cancer patients. *J Breast Health*, **9**, 57-63.

Zanapalioglu Y, Atahan K, Gur S, Cokmez A, Tarcan E (2009). Effect of breast conserving surgery in quality of life in breast cancer patients. *J Breast Health*, **5**, 152-6.

Zhang YX, Wang X-M, Kang S, Li X, Geng J (2013). Common variants in the PALB2 gene confer susceptibility to breast cancer: A meta-analysis. *Asian Pac J Cancer Prev*, **14**, 7149-54.