Quality of Life in Patients Undergoing Mastectomy for Breast Cancer

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ABSTRACT

BACKGROUND

Breast cancer is the most common female cancer worldwide and carries significant psychosocial morbidity. The diagnosis of the disease and the treatment modalities like surgery and chemotherapy contribute to the morbidity. Physical and psychosocial morbidity associated with diagnosis of cancer and treatment modalities like mastectomy and chemotherapy can lead to significant decline in the quality of life of these patients. We wanted to assess the quality of life in patients undergoing mastectomy for carcinoma breast, identify the preoperative factors that affect the quality of life and find out the correlation between degree of neuroticism of the individual and quality of life.

METHODS

35 female patients who had mastectomy for breast cancer were evaluated at three time points, preoperatively, immediately after surgery and 2 months after surgery. Quality of life was assessed by WHO-QoL BREF and neuroticism was assessed by Eysenck Personality Inventory-Neuroticism subscale (EPI-N).

RESULTS

There was a significant decline in quality of life over the course of three interviews. Age, marital status, menopausal status and chemotherapy were factors which had an influence on quality of life. Preoperative EPI-N scores negatively correlated with quality of life.

CONCLUSIONS

There is significant deterioration in the quality of life of patients undergoing mastectomy for breast cancer. Patients who had preoperative chemotherapy had a poorer quality of life. Our study shows that quality of life is affected by age, marital status, menopausal status, and level of neuroticism.

KEYWORDS

Quality of Life, Breast Cancer, Mastectomy, Neuroticism

BACKGROUND

Breast cancer is the most common cancer among women worldwide and constitutes 25% of all cancers with an estimated 1.67 million cases newly diagnosed in 2012 and 521900 deaths. It accounts for 25% of cancer cases and 15% of all cancer related deaths among females. In India breast cancer is the commonest cause of cancer death among women[1] There is a consistent positive trend towards improved survival in published literature over the last couple of decades and this can be attributed to the advancements in screening methods, early diagnosis and multidisciplinary treatment modalities.[2] With the improvement in disease free survival, the focus on quality of life has become more relevant than ever. Diagnosis and treatment of breast cancer have considerable psychological influences and impairment in Quality of Life (QoL).

Neuroticism is a fundamental domain of personality and persons with elevated levels of neuroticism respond poorly to environmental stress.[3] Preoperative identification of this subset of patients can guide us in formulating the optimum counselling strategies. There have been only a few studies evaluating the relationship between degree of neuroticism and the quality of life in breast cancer patients and it was in this context that the present study was conceived.

Objectives

1. To assess the quality of life in patients undergoing mastectomy for carcinoma breast.
2. To identify the preoperative factors that significantly affect the quality of life.
3. To find out the correlation between degree of neuroticism of the individual and quality of life.

METHODS

The study was conducted prospectively at Government Medical College, Kozhikode, a Tertiary care Teaching Hospital in Kerala. Patients were interviewed three times during the study. The first interview was done after a diagnosis of breast cancer was made but well before the day of surgical procedure. Care was taken not to interview the patient on the immediate preoperative day. Second interview was done during the postoperative period after the patient was well ambulant and pain free. Third interview was made at the end of second month after surgery.

Inclusion Criteria

35 consecutive patients attending the Surgery Outpatient Department with a confirmed diagnosis of Carcinoma Breast and undergoing surgery and adjuvant therapy at the institution itself were included in the study. Only female patients with breast cancer were enrolled.

Exclusion Criteria

1. Patients who had a history of psychiatric illness
2. Those who were having advanced metastatic disease with low life expectancy and possibility of cerebral metastasis.
3. Patients who were not willing or capable of answering the questionnaire either due to illness or due to unwillingness.
4. Patients with recurrent and bilateral carcinoma breast.
5. Patients who had any part of their treatment viz. surgery, radiotherapy or chemotherapy at other institution (s).

The study was approved by the Hospital Ethical Committee. Informed consent was obtained from all the patients.

Tools

WHO QoL-BREF

WHO QoL -100 was developed by the WHO QoL group with fifteen international field centres simultaneously in an attempt to develop a quality of life assessment tool that would be applicable cross culturally. However it is too lengthy for practical uses in many instances. WHO QoL-BREF has been developed as valid and reliable alternative to WHO QoL -100[4, 5]. It contains 26 items. The first two questions are general in nature and relate to overall quality of life. The remaining questions are divided into four domains.

    Domain 1- Physical health.
    Domain 2- Psychological.
    Domain 3- Social relationship.
    Domain 4- Environment.

The four domain scores denote an individual's perception of quality of life in each domain. Higher the score, higher the quality of life. The scores of each domain and the sum of all scores were compared between the visits and also correlated with socio-demographic parameters and with degree of neuroticism. A validated vernacular version of the questionnaire is available and was used for this study.

Eysenck Personality Inventory – Neuroticism Subscale (EPI-N)

Eysenck Personality Inventory assesses the two dimensions which account for majority of the variations in personality, namely Extroversion/Introversion (E) and Neuroticism/ Stability (N).[6] Thus EPI has two scales E and N to assess these two dimensions. The neuroticism scale was used for this study. The high end of neuroticism is indicative of instability and over reactivity. Individuals who have high scores tend to be emotionally over responsive and have difficulty in returning to normal state after emotional experiences. Individuals with low scores tend to be better adjusted and emotionally more stable. EPI has two parallel forms, A and B. EPI has been standardised in India and vernacular versions are available. In the present study, we

used EPI Form A standardised by Verghese and Abraham.[7] EPI-N consists of 24 questions with answers either 'yes' or 'no', 'yes' being scored as 1 and 'no' being scored as 0.Score up to 8 are taken as low, 9 to 16 as moderate and 17 and above as high degree of neuroticism. Since this is a stable dimension it was used only once, at the time of entry into the study.

During the subsequent visits WHO QoL-BREF was administered but EPI-N was not administered. Disease was staged using TNM classification.

Statistical Analysis

Data obtained was tabulated, quality of life scores at three interviews were calculated. Statistical analysis was done using SPSS Software. For data analysis, non-parametric tests namely Wilcoxon Signed Rank Test, McNemar Test, Kruskal Wallis Test, and Mann Whitney-U Test were used. For correlation Spearman's rho was used.

RESULTS

The socio-demographic data revealed that 68.6% of the patients were in the below fifty years age group and almost 90% were below sixty years. Mean age of study population was 47.46 years. 82.9% of the patients were from a rural background. 85.7% from low income group remaining were from a middle income group and none of them were from a high income group. 88.5% of our patients were educated up to primary or high school level and only 8.6% did not receive any formal education. 71.4% of our patients were married, 14.3% were widowed, 8.6% were separated from their husbands and 5.7% were unmarried. 51.4% of our patients had stage 2 disease and 48.6% had stage 3 disease. 92.4% of the subjects received some form of chemotherapy. While 37.1% received it preoperatively as neo-adjuvant chemotherapy followed by postoperative continuation chemotherapy, 55.1% received it only during the postoperative period. There was a gradual decline in the quality of life scores across all domains during the period of study. Further analysing this we compared the scores between the visits. Comparing between the first and second visit, there was statistically significant deterioration in total, domain 1 and domain 3 scores. Comparing median scores between the second and third interviews, all scores except domain 1 scores showed a further significant deterioration.

			Age
Spearman's rho	QoL Total	Correlation coefficient	.359
		Sig. (2-tailed)	.034*
	Domain 1	Correlation coefficient	.459
		Sig. (2-tailed)	.006*
	Domain 2	Correlation coefficient	.469
		Sig. (2-tailed)	.005*
	Domain 3	Correlation coefficient	.056
		Sig. (2-tailed)	.747
	Domain 4	Correlation coefficient	.248
		Sig. (2-tailed)	.151
Table 1. Correlation between Age and QoL Scores			
All scores are for the third visit.			

	Chemotherapy	Median Score	'P' Value
QoL Total	Yes	56.00	0.04*
	No	71.00	
Domain 1	Yes	14.00	0.022*
	No	20.00	
Domain 2	Yes	11.00	0.049*
	No	17.00	
Domain 3	Yes	6.00	0.053
	No	8.00	
Domain 4	Yes	21.00	0.243
	No	25.00	
Table 2. Preoperative Chemotherapy and QoL Score at the First Visit			
Mann-Whitney U test.			

Dependent Variable			Sig.
QoL Total	Unmarried	Married	1.000
		Widow	.133
		Separated	1.000
	Married	unmarried	1.000
		Widow	.040
		Separated	1.000
	Widow	Unmarried	.133
		Married	.040
		Separated	.008
Domain 1	Unmarried	Married	1.000
		Widow	.047
		Separated	1.000
	Married	Unmarried	1.000
		Widow	.003
		Separated	1.000
	Widow	Unmarried	.047
		Married	.003
		Separated	.007
Domain 2	Unmarried	Married	1.000.
		Widow	.051
		Separated	1.000
	Married	Unmarried	1.000
		Widow	.002
		Separated	1.000
	Widow	Unmarried	.051
		Married	.002
		Separated	.004
Domain 3	Unmarried	Married	1.000
		Widow	.633
		Separated	1.000
	Married	Unmarried	1.000
		Widow	1.000
		Separated	.022
	Widow	Unmarried	.633
		Married	1.000
		Separated	.023
Domain 4	Unmarried	Married	1.000
		Widow	.088
		Separated	1.000
	Married	Unmarried	1.000
		Widow	.017
		Separated	.189
	Widow	Unmarried	.088
		Married	.017
		Separated	.002
Table 3. Comparison Of Scores Based on Marital Status			
Bonferroni- All scores are for the third visit.			

	Menopausal Status	Mean Score	'p' value
QLI Total	Premenopausal	51.62	0.61
	Postmenopausal	61.94	
Domain 1	Premenopausal	14.87	0.095
	Postmenopausal	18.15	
Domain 2	Premenopausal	10.31	0.02*
	Postmenopausal	15.31	
Domain 3	Premenopausal	6.7	0.83
	Postmenopausal	6.4	
Domain 4	Premenopausal	20.00	0.24
	Postmenopausal	22.52	
Table 4 Menopausal Status and QoL Scores			
Mann Whitney U test - all scores are for the third visit.			

Quite expectedly the comparison of scores between first and third visits showed an across the board deterioration in all domains. Analysing the factors which influence the quality of life, we found that those who are younger experienced a poorer quality of life in terms of total, domain 1 and domain

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2 scores. Table 1 shows the correlation between age and QoL scores at the third visit.

		EPI-N Score
QoL Total	Correlation coefficient	-0.662
	Sig. (2-tailed)	<0.001
Domain 1	Correlation coefficient	-0.570
	Sig. (2-tailed)	<0.001
Domain 2	Correlation coefficient	-0.513
	Sig. (2-tailed)	<0.001
Domain 3	Correlation coefficient	-0.621
	Sig. (2-tailed)	<0.001
Domain 4	Correlation coefficient	-0.732
	Sig. (2-tailed)	<0.001
Table 5. Correlation Between EPI-N Score and QoL Scores at Third Visit		
Spearman's rho		

Comparing those who had preoperative chemotherapy and those who did not have, chemotherapy group had a lower QoL score at the first visit itself in total QoL and Domain 1 and 2 scores (Table 2). Comparing the scores between the patients of different marital status, it is seen that widows had a significantly better QoL compared to married in Total, Domain 1, Domain 2 and Domain 4 scores (Table 3). Widows also had a higher score compared to women living separated from their husbands in all domains. In Domain 3 married women had a worse score than those living separated from husbands. Menopausal status also had a bearing on the QoL scores in Domain 2, where premenopausal women had a significantly worse QoL compared to postmenopausal women (Table 4). We found a significant negative correlation between EPI-N scores and quality of life. Higher the EPI-N scores, lower was the QoL scores in all domains (Table 5).

DISCUSSION

Quality of life is a subjective phenomenon. Its definition is very broad and varies from author to author. Shumaker et al describes it as an individual's overall satisfaction with life and their general sense of personal well being.[8] According to Schipper et. al,[9] Health Related Quality of Life (HRQoL) is the functional effect of a medical condition and/or its consequent therapy on a person. HRQoL is thus subjective, multidimensional, encompassing physical and occupational function, psychological state, social interaction and somatic sensation. WHO defines quality of life as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.[5] With the number of survivors growing in recent years, breast cancer patients have been assessed with multiple QoL instruments in order to compare effects of breast cancer and its treatments to people with other chronic illnesses as well as healthy ones.[10]

The analysis of socio-demographic data reveals that over two-thirds of our patients were in the below fifty years age group and almost 90% were below 60 years. The mean age of our patients (47.46 years) was in accordance with the current trend of decreasing age of breast cancer in India.

We can presume that this younger age of patients would have contributed to lower QoL of our patients, because in the discussion that follows our data itself shows a lower QoL in younger patients. Most of our patients were from a rural background, low income group and educated up to primary or high school level. However, all the patients in the study were literate and with this 100% literacy we found that all patients had some degree of awareness about breast cancer and its seriousness. Their high degree of awareness about breast cancer could have contributed to the psychological sufferings and thereby the quality of life in these patients. Our findings are in contradiction to the findings of Khubalkar et al in which the subjects were found to be totally ignorant of the severity of the disease.[11]

Our patients had a steady decline in the quality of life along the course of the study. There is a decline in Domain 1 and 3 and total scores of quality of life immediately after surgery i.e. between the first and second visits. Between second and third visits, there is decline in all domains except Physical domain. During this period patients were recovering physically from surgery, but the psychological, social and environmental effects continued to take a toll on the patient's QoL. When we consider the first and third visit there is a significant deterioration in QoL in all domains indicating the trauma afflicted by the treatment interventions viz. surgery and chemotherapy on the patient. Montazzeri et. al found that Global QoL in breast cancer patients, which showed an improvement at 3 months, worsened after 18 months.[12]

Factors Affecting the QoL

Age
In our patients we found that age was a determining factor. Younger patients had a poorer quality of life compared to older patients (Table 5) in Domains 1 and 2 as well as Total QoL. Sharma et al in their study of 60 women on postmastectomy radiotherapy found that younger patients had a significantly worse outcome in Physical and Social functioning scores (on EORTC 30 item QoL questionnaire).[13] It is likely that younger patients had more social inhibition after mastectomy. Being more active in life, the younger subjects would have found the post-operative physical disability more distressful. This being a short term study, it is also possible that this pattern with age can change. In fact, there are other studies showing a different trend in the long term. Bantemo-Joppe et al found that role functioning, emotional and cognitive functioning were better in the younger group.[14] Cimprich et al found that long term survivors of breast cancer aged more than 65 years fared significantly worse in the physical domain while those aged 27-44 years had a worse outcome in the social domain of QoL.[15]

Chemotherapy
This study shows that there is a reduction in Total QoL score as well as Domain 1 and 2 scores at first visit between those who had preoperative chemotherapy and those who did not

have. Almost all patients had chemotherapy in postoperative setting. Hence this factor was not analysed in the second and third visits. Jeffe et al in their study have found that chemotherapy has significant short term negative impact on QoL regardless of the type of surgery which rebounded after completion of adjuvant treatment.[16] Tiezzi et al in their study found that chemotherapy worsened QoL in Physical Function and the Role-Physical domain of SF-36 in breast cancer patients.[17]

Studies have also shown that decreased health related quality of life as a result of side effects of chemotherapy may predict early treatment discontinuation in these patients.[18]

Marital and Menopausal Status

Our study showed that compared to other groups, married patients had a poorer quality of life. This could be because sexual and body image disturbances were more of a problem to the married, than those who were widowed, separated from husbands or unmarried. Again, premenopausal women had significant reduction in domain 2. Thus, the present study points to the fact that younger, premenopausal and married women fare poorly with respect to QoL post mastectomy. This is in contrast to some of the published data which showed married patients fared better compared to divorced and unmarried.[19]

Neuroticism

28.6% of our patients were in a low neuroticism category while 34.2% were in moderate and 37.2% in high neuroticism category. The level of neuroticism indicates the emotional responsiveness of the patient and those with higher EPI-N scores are likely to develop neurotic disorders under stress. Morris et al. found that patients who were stressed at 2 years after mastectomy had a higher EPI-N score (median 18) compared to those who were not stressed (median 10).[20] Dean C et al found a significant relationship with neuroticism level and deterioration of marital relationship less than three months after operation.[21] In tune with this, our study shows a high degree of negative correlation between EPI-N scores and QoL. Higher the EPI-N scores, lower was the QoL. Personality has been shown to be more powerful in predicting psychological distress than external events such as diseases or stressful life events. Neuroticism has been shown to have a negative influence on psychosocial adjustment and QoL of breast cancer patients in previous studies.[22, 23] our study also brings us to a similar very strong correlation between personality and QoL. Thus, the preoperative EPI-N scores could be useful in predicting the QoL after mastectomy and also in identifying the subset of population who will need more intense counselling strategies.

Counselling by a trained nurse has, in fact, been proven to reduce the psychosocial morbidity in breast cancer patients.[24] Implementation of QoL assessments into clinical practice for breast cancer has a high potential to benefit patients and can contribute to the holistic treatment of these patients.[25] An integrated psychoeducational program has been found to be an effective intervention for reducing distress and increasing QoL of newly diagnosed patients with breast cancer.[26] Our study underscores the importance of psychological intervention in breast cancer patients highlighting the fact that those with a high Neuroticism score, if identified early can possibly benefit more from such supportive psychological interventions.

Socioeconomic status, background (rural vs urban), religion and educational status, as far as our results are concerned, did not make any significant impact of QoL. This is in contrast to a reported study by Sharma et.al which showed significant impact of socioeconomic status and educational status on QoL.[13] In our study radiotherapy also did not have any significant influence on QoL.

The effect of stage of the disease on QoL was not analysed as we had excluded early disease (which undergo Breast Conserving Procedures) as well as very advanced disease from our study and all cases happened to be in stage 2 or stage 3, making a meaningful analysis difficult.

Limitations

This study assessed the quality of life in breast cancer patients undergoing mastectomy in the short term only. The sample size was relatively small. A larger sample size and a longer follow-up of 1 - 2 years is needed based on the findings of this study to draw up firm recommendations.

CONCLUSIONS

Quality of life in breast cancer patients undergoing mastectomy is affected by age, marital status, menopausal status and preoperative chemotherapy. Level of neuroticism as measured by Eysenck Personality Inventory – Neuroticism subscale (EPI-N) has a significant negative correlation with the quality of life.

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