

Factors Affecting Survival of Women Diagnosed with Breast Cancer in El-Minia Governorate, Egypt

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Date of Submission: Mar 13, 2011

Date of Acceptance: May 28, 2011

ABSTRACT

Objectives: This study was conducted to determine breast cancer survival time and the association between breast cancer survival and socio-demographic and pathologic factors among women, in El-Minia, Egypt. While there has been much researches regarding prognostic factors for breast cancer but the majority of these studies were from developed countries. El-Minia has a population of approximately 4 million. To date, no research has been performed to determine breast cancer survival and the factors affecting it in El-minia.

Methods: This retrospective study used data obtained from the cancer registry in the National Institute of Oncology in El-Minia and included 1207 women diagnosed with first primary breast cancer between 1st January 2005 and 31st December 2009 and followed to 30th June 2010. The association between survival and sociodemographic and pathological factors and distant metastasis at diagnosis, and treatment options was investigated using unifactorial chi-square test and multi-factorial (Cox regression) analyses. Kaplan-Meier analysis was used to compare survival time among different groups.

Results: Median survival time was 83.8 ± 3.2 . Cox regression showed that high vs low educational level (Hazard ratio (HR) = 0.35, 95% CI; 0.27-0.46), metastases to bone (HR = 3.22, 95% CI: 1.71-6.05), metastases to lung (HR = 2.314, 95% CI: 1.225-4.373), tumor size (≤ 2 cm vs ≥ 5 cm: HR = 1.4, 95% CI: 1.1-1.8) and number of involved nodes (1 vs > 10 HR = 5.21, 95% CI: 3.1-9.01) were significantly related to survival.

Conclusions: The results showed the need to develop screening programs and standardized treatment regimens in a tax-funded health care system.

Keywords: Breast cancer, Survival, Egypt.

Int J Prev Med 2011; 2(3): 131-138

INTRODUCTION

Breast cancer is the most common cancer of women in the world over, and its incidence is rising, especially in developing countries, where the disease poses a major health care challenge. This growing incidence in developing countries reflects the advanced stage at diagnosis, low levels of public awareness of the risk for the disease, and poor medical infrastructure and expertise, with the resultant poor treatment outcomes.¹

Breast cancer is the leading cause of cancerrelated mortality in women worldwide. Almost half of annually diagnosed women with breast cancer belong to developing countries, where they present at a younger age with advancedstage disease. These women also have poor overall outcomes compared to women in developed countries. The advanced stage of presentation of breast cancer in developing countries was attributed to a lack of mass education and screening programs, poverty, poor access to health care facilities, lack of expertise, and poor country infrastructure.²

According to the Egypt National Cancer

Institute, breast cancer is the most common cancer among women representing 18.9% of total cancer cases (35.1% in women and 2.2% in men) with an age-adjusted rate of 49.6 per 100.000 populations.³ Advanced disease remains very common in Egypt, Tunisia, Saudi Arabia, Syria, Palestinians, and others. Mastectomy is still performed in more than 80% of women with breast cancer. Awareness campaigns and value of clinical breast examination were validated in the Cairo Breast Cancer Screening Trial.⁴

The prevalence of breast cancer in Europe and the United States is estimated between 8 to 10%. However, the lowest prevalence is seen in Asian countries at about 1%.⁵ Further, the association between breast cancer survival and sociodemographic and pathologic factors has been widely studied; but the majority of these studies are from developed countries.

Prognosis is usually better than other major cancers, and an improvement in survival in recent decades has been reported.⁶ This improvement has been variously ascribed to early diagnosis, including widespread use of mammography or mass screening campaigns and to increasing use of effective adjuvant therapy.⁷

Survival after cancer diagnosis is one of the major outcome measurements and key criteria for assessing quality of cancer control related to both the preventive (early detection) and the therapeutic level. Using data from cancer registries allows population-based comparisons.

This study was conducted to determine the breast cancer survival time and explore the association between the breast cancer survival and socio-demographic and pathologic factors and distant metastases at time of diagnosis in El-Minia. El-Minia has a population of approximately 4 million. To date, no research has been performed to determine breast cancer survival and its associated factors in this region.

METHODS

This retrospective study used patients' records from the National Institute of Oncology database in El-Minia, which is a hospital-based registry in a tertiary care centre which delivers oncology services to a population of approximately four million. This is the only centre which delivers oncology services in El-Minia. Therefore, most probably all cancer patients come to this hospital for treatment. However a few of them (about 2%) may travel to other treatment centers.

This study included women who were

diagnosed with breast cancer between 1st January 2005 and 31st December 2009. During that period, 1256 were registered as having female breast cancer. 39 women were excluded due to previous breast cancer and other cancers. In addition, 10 women were lost to follow up. Thus, the study population comprised 1207 women who were diagnosed with a first primary invasive breast malignancy and who underwent breast surgery including axillary dissection.

Criteria of exclusion were women with previous breast cancer and other cancers, and women who had not follow-up after initial diagnosis.

All patients were followed-up at regular threemonth intervals for the first year following diagnosis and regular six-month follow-ups thereafter. The last date of follow-up was 30th June 2010.

There are three treatment options that have been offered in three sequences: surgery followed by chemotherapy and then by radiation, chemotherapy followed by surgery then chemotherapy and then by radiation, and surgery followed only by radiation, which are the current practice in this region.

The registry contains information about prognostic factors: tumor size and location, histopathological grade, number of involved axillary lymph nodes, treatment modalities, distant metastasis, age at breast cancer diagnosis, and some socio-demographic factors. These variables were divided into three groups namely; socio-demographic, distant metastases, and clinico-pathological.

Statistical analysis

Univariate analyses were performed to describe the relationship between each of the independent variables and survival. Chi-square test was calculated for each comparison.

Variables were considered firstly in the three conceptual groups: socio-demographic factors, clinical/pathological factors, and distant metastases. Each model included all variables from the particular group. Variables that were statistically significant unifactorially, entered together in multi-factorial model. A final model was fitted by combining all variables which were statistically significant in the three groups separately, using Cox's regression (Multi factorial analysis). Survival time was estimated using the Kaplan– Meier method and log-rank test was used to compare survival times between groups.

All analyses were conducted using SPSS for Windows version 11 (SPSS Inc., Chicago, IL).

Ethical consideration

This study was approved by the institutional review boards of National Institute of Oncology in El Minia.

RESULTS

Effect of socio-demographic variables on survival

Of the 1207 patients included in the analysis, 840 were alive and 367 had died at the end of follow-up. The mean age at diagnosis was 56 years.

In unifactorial analysis of association of socio-

demographic factors and survival, only residence, educational level, and occupation were significantly associated with survival (P < 0.0001) (Table 1). Death among rural patients was higher than among urban patients (37.0% compared to 24.9%). Patients with lower educational level had died more than those with higher education (49.6% among illiterate patients compared to 4.8% among highly educated patients). Housewives had died more than skilled patients (47.9% compared to 11.5%).

Table 1. Association of sociodemographic variables and survival among women diagnosed with cancer breast, El-Minia, Egypt

| Sociodemographic variables | Censored | Died | total | Chi- | P-value |
|---------------------------------|--------------|--------------|--------------|--------|--------------|
| Age group at time of diagnosis | NO. (%) | INU. (70) | INU. (70) | square | |
| < 35 years | 46 (67 6%) | 22 (32.4%) | 68 (5 6%) | | |
| 36-49 years | 271 (71 3%) | 109 (28 7%) | 380 (31 5%) | | |
| 50-64 years | 291 (69.1%) | 130(30.9%) | 421 (34.9%) | 0.84 | 0.8 |
| > 65 years | 232 (68 6%) | 106 (31.4%) | 338 (28.0%) | | |
| Marital status | 202 (00.070) | 100 (5111/0) | 220 (20.070) | | |
| Single | 119 (67.6%) | 57 (32.4%) | 176 (14.6%) | | |
| Married | 698 (69.6%) | 301 (30.1%) | 999 (82.8%) | 0.4 | 0.8 |
| Divorced and widowed | 23 (71.9%) | 9 (28.1%) | 32 (2.6%) | 011 | 0.0 |
| Residence | | / () | () | | |
| Urban | 495(75.1%) | 164(24.9%) | 659 (54.6%) | • • • | * |
| Rural | 345 (63.0%) | 203(37.0%) | 548 (45.4%) | 20.9 | 0.0001 |
| Education | () | | | | |
| Illiterate | 271 (50.4%) | 267 (49.6%) | 538 (44.6%) | | |
| Read and write | 270 (79.4%) | 70 (20.6%) | 340 (28.2%) | | * |
| Below university level | 160 (87.4%) | 23 (12.6%) | 183 (15.2%) | 182.2 | 0.0001 |
| University level or above | 139 (95.2%) | 7 (4.8%) | 146 (12.1%) | | |
| Occupation | | . (,) | | | |
| Housewife | 285 (52.1%) | 262 (47.9%) | 547 (45.3%) | | |
| Manual | 301 (80.7%) | 72 (19.3%) | 373 (30.9%) | 149.3 | 0.0001^{*} |
| Skilled | 254 (88.5%) | 33 (11.5%) | 287 (23.8%) | | |
| No. of children | × / | · · · · · | 916 | | |
| ≤ 3 | 392 (75.1%) | 130 (24.9%) | 522(57.0%) | 0.04 | 0.0 |
| > 3 | 298 (75.6%) | 96(24.4%) | 394(43.0%) | 0.04 | 0.9 |
| OCP use | | | 169 | | |
| \leq 3 years | 82 (68.3%) | 38(31.7%) | 120(71.0%) | 0.4 | 0.5 |
| > 3 years | 31 (63.3%) | 18 (36.7%) | 49 (29.0%) | 0.4 | 0.5 |
| Menarche age | | | . , | | |
| \leq 13 years | 346 (72.2%) | 133 (27.8%) | 479 (39.7%) | 2.6 | 0.1 |
| >13 years | 494 (67.9%) | 234 (32.1%) | 728 (60.3%) | 2.6 | 0.1 |
| Family history of breast cancer | . , | · · · · | | | |
| Yes | 587 (68.8%) | 266 (31.2%) | 853(70.7%) | 0.02 | 0.26 |
| No | 253 (71.5%) | 101 (28.5%) | 354(29.3%) | 0.83 | 0.36 |
| Breast feeding | | · · · · | | | |
| Yes | 486(70.8%) | 200 (29.2%) | 686(56.8%) | 1 10 | 0.00 |
| No | 354 (67.9%) | 167(32.1%) | 521(43.2%) | 1.18 | 0.28 |
| Total | 840 (69.6%) | 367 (30.4%) | 1207 (100%) | | |

* Statistically significant

OCP: Oral contraceptive pills

Censored: the patients who still alive to the end of the follow-up

Factors Affecting Survival of Breast Cancer

Effect of distant metastases on survival

Metastases to liver, lung, and bone were all significantly associated with poorer survival in the unifactorial analyses (Table 2). Compared to the patients without distant metastasis, deaths among those with lung, bone or liver metastasis were higher (41.7%, 40.6%, and 56.5% compared to 27.6%, 29.2%, and 27.8% respectively.

Effect of clinical/pathological variables on survival

Of clinical/pathological factors, greater tumor size and higher grade, skin and nipple involvement, higher number of involved lymph nodes, treatment and type of surgery were significantly associated with poorer survival in the unifactorial analyses (Table 3).

Patients with tumor size of 5 cm and above had died more than the patients with tumor size 2 cm and less (45.3% compared to 22.3% respectively).

Patients with poorly differentiated tumor grades had died more than those with well differentiated tumor grades (42.7% compared to 25.7%). There was a rise in deaths with the increased number of involved lymph nodes ranging from 73.8% to 26.6% compared to node negative patients.

Death among patients with skin and nipple involvement was higher than among those with free skin and nipple (46.3% and 41.3% compared to 20.7% and 27.0%, respectively).

Multifactorial analysis of variables from the three groups

We modeled all statistically significant variables of the three previous models together to explore how the effect of socio-demographic, distant metastases and clinico-pathological variables might influence survival. The factors that remained significant in multi-factorial model were tumor size, number of involved lymph nodes, residence, education, occupation, lung and bone metastases, and type of surgery (Table 4). Compared to patients without distant metastasis, those with lung metastasis had more than twice, and those with bone metastasis had over three times the risk of death. Patients with tumor size ≥ 5 cm had more increase in risk of death compared to the patients with tumor size ≤ 2 cm. Those with increased number of involved lymph nodes had more than five fold increase in risk compared to lymph node negative patients.

Kaplan-Meier analysis of survival time

Kaplan-Meier analysis displayed the mean/median survival times, standard error and 95% confidence interval for different groups with log-rank test comparing the survival time of different groups and the significant difference was observed between different groups in education, occupation, lung and liver metastasis, no. of involved lymph nodes, skin and nipple involvement, type of surgery and tumor size (Table 5). Mean survival time was 84.6 \pm 1.7 and 95% CI was 81.4-87.9. Median survival time was 83.8 \pm 3.2 and 95% CI was 77.6-89.9.

DISCUSSION

This retrospective study conducted at the National Institute of Oncology in El-Minia City investigated the socio-demographic and clinicopathological factors associated with breast cancer survival in women. Of 1207 women diagnosed with first primary breast cancer between 1st January 2005 and 31st December 2009, 34.9% of cases were in the age group 50–64 years.

This study showed a statistically significant relation between breast cancer survival and lower education and occupation with low income and with a residence in rural areas

| Distant metastasis | Censored No. (%) | Died No. (%) | Total No. (%) | Chi-square | P-value |
|-----------------------|---------------------|-----------------|------------------|-------------------|---------|
| Lung metastasis | | | | | |
| Yes | 140 (58.3%) | 100 (41.7%) | 240 (19.9%) | 17.95 | 0.0001 |
| No | 700 (72.4%) | 267 (27.6%) | 967 (80.1%) | | |
| Bone metastasis | | | | | |
| Yes | 76 (59.4%) | 52 (40.6%) | 128 (10.6%) | 7.1 | 0.008 |
| No | 764 (70.8%) | 315 (29.2%) | 1079 (89.4%) | | |
| Liver metastasis | | | | | |
| Yes | 47 (43.5%) | 61 (56.5%) | 108 (8.9%) | 38.1 | 0.0001 |
| No | 793 (72.2%) | 306 (27.8%) | 1099 (91.1%) | | |

Table 2. Association of distant metastasis and survival among women diagnosed with cancer breast, El-Minia, Egypt

| Clinico-pathological vari- | Censored | Died | Total | Chi-square | p-value |
|-----------------------------|-------------|-------------|-------------|------------|---------|
| ables | No. (%) | No. (%) | No. (%) | om square | p · muo |
| No. of involved lymph nodes | (, .) | (,) | | | |
| 0.0 | 645 (73.4%) | 234 (26.6%) | 879 (72.8%) | | |
| 1-5 | 153 (69.5%) | 67 (30.5%) | 220 (18.2%) | 50.2 | 0.0001 |
| 6-10 | 31 (47.0%) | 35 (53.0%) | 66 (5.5%) | 59.3 | 0.0001 |
| > 10 | 11 (26.2%) | 31 (73.8%) | 42 (3.5) | | |
| Tumor grade | ~ / | × , | ~ / | | |
| Well differentiated | 255 (74.3%) | 88 (25.7%) | 343 (37.3%) | | |
| Moderately differentiated | 344 (68.5%) | 158 (31.5%) | 502 (54.6%) | 9.3 | 0.01 |
| Poorly differentiated | 43 (57.3%) | 32 (42.7%) | 75 (8.2%) | | |
| Tumor size | . , | · · · | | | |
| < 2 cm | 373 (77.7%) | 107 (22.3%) | 480 (42.3%) | | |
| $\overline{2}$ -5 cm | 243 (66.2%) | 124 (33.8%) | 367 (32.4%) | 44.8 | 0.0001 |
| > 5 cm | 157 (54.7%) | 130 (45.3%) | 287 (25.3%) | | |
| Skin involvement | | · · · · | · · · · | | |
| Yes | 246 (53.7%) | 212 (46.3%) | 458 (37.9%) | 07.00 | 0.0001 |
| No | 594 (79.3%) | 155 (20.7%) | 749 (62.1%) | 87.98 | 0.0001 |
| Nipple involvement | | | | | |
| Yes | 168 (58.7%) | 118 (41.3%) | 286 (23.7%) | 20.96 | 0.0001 |
| No | 672 (73.0%) | 249 (27.0%) | 921 (76.3%) | 20.86 | 0.0001 |
| Tumor location | | | | | |
| Lateral | 237 (67.5%) | 114 (32.5%) | 351 (29.1%) | | |
| Medial | 362 (68.7%) | 165 (31.3%) | 527 (43.7%) | 2.99 | 0.2 |
| Central | 241 (73.3%) | 88 (26.7%) | 329 (27.3%) | | |
| Type of treatment | | | | | |
| C & S & C & R | 245 (76.8%) | 74 (23.2%) | 319 (26.4%) | | |
| S & C & R | 354 (70.4%) | 149 (29.6%) | 503 (41.7%) | 16.89 | 0.0001 |
| S & R | 241 (62.6%) | 144 (37.4%) | 385 (31.9%) | | |
| Surgery | | | | | |
| MRM | 233 (74.7%) | 79 (25.3%) | 312 (25.8%) | | |
| RM | 213 (71.0%) | 87 (29.0%) | 300 (24.9%) | 21.0 | 0.0001 |
| TM | 345 (69.4%) | 152 (30.6%) | 497 (41.2%) | 21.9 | 0.0001 |
| Quadrantectomy | 49 (50.0%) | 49 (50.0%) | 98 (8.1%) | | |

Table 3. Association of clinico-pathological variables and survival among women diagnosed with cancer breast, El-Minia,Egypt

S & C & R: Surgery and Chemotherapy and Radiotherapy; C & S & C & R: Chemotherapy and Surgery and Chemotherapy and Radiotherapy; S & R: Surgery and Radiotherapy; MRM: Modified Radical Mastectomy; RM: Radical Mastectomy, TM: Total Mastectomy.

Table 4. Multi-factorial analysis of statistically significant factors from previous three groups among women diagnosed with cancer breast, El-Minia, Egypt.

| Variables | Hazard ratio (HR) | 95% CI | P- value |
|-----------------------------|-------------------|--------------|----------|
| Residence | 2.405 | 1.809- 3.196 | 0.0001 |
| Education | 0.35 | 0.27-0.46 | 0.0001 |
| Occupation | 1.426 | 1.059- 1.92 | 0.02 |
| Lung metastasis | 2.314 | 1.225-4.373 | 0.01 |
| Bone metastasis | 3.22 | 1.71 - 6.05 | 0.018 |
| Type of surgery | 1.404 | 1.176- 1.677 | 0.0001 |
| Tumor size | 1.4 | 1.1 - 1.8 | 0.009 |
| No. of involved lymph nodes | 5.21 | 3.1-9.01 | 0.043 |
| Tumor grade | 0.97 | 0.72-1.3 | 0.87 |
| Skin involvement | 0.94 | 0.6–1.4 | 0.787 |
| Nipple involvement | 1.2 | 0.8 - 1.8 | 0.276 |
| Liver metastasis | 1.2 | 0.7-2.15 | 0.446 |
| Treatment | 1.86 | 1.39–2.50 | 0.127 |

Chi-square = 163.017

P < 0.0001

Factors Affecting Survival of Breast Cancer

| | Surviv | _ Log-rank test | | |
|------------------------------|---|---|-------------|--|
| Factor | Mean ± SE (95%CI) | Median ± SE (95%CI) | (p-value) | |
| Residence | · · · · | | | |
| Urban | 88.79 ± 2.55 (83.8-93.8) | 86.2 ± 6.5 (73.5-98.95) | 27 (0.054) | |
| Rural | 81.35 ± 2.2 (77.01-85.7) | 81.93 ± 3.55 (74.98-88.9) | 3.7 (0.054) | |
| Education | | | | |
| Illiterate | 70.4 ± 2.06 (66.4-74.5) | $64.9 \pm 3.2 (58.8-71.1)$ | | |
| Read and write | 86.5 ± 3.3 (79.99-93.09) | 83.9 ± 4.09 (75.9-91.9) | 115.37 | |
| Below university level | 115.2 ±3.6 (108.2-122.2) | | (0.0001) | |
| University level or above | 115.9 ±3.5 (108.96-122.8) | | · · · · · | |
| Occupation | `````````````````````````````````````` | | | |
| Housewife | 72.3 ± 2.02 (68.4-76.3) | 68.1 ± 2.5 (63.2-73.02) | | |
| Manual | $103.6 \pm 3.05 (97.7 - 109.6)$ | , | 74.6 | |
| Skilled | 99.9 ± 3.9 (92.3-107.6) | 94.8 ± 7.96 (79.2-110.4) | (0.0001) | |
| Lung metastasis | | | | |
| Yes | 73.4 ± 2.98 (67.58-79.3) | $73.03 \pm 5.7 (61.9 - 84.1)$ | 10.43 | |
| No | 87.8 ± 1.9 (84.01-91.6) | 84.8 + 4.06(76.8 - 92.8) | (0.001) | |
| Bone metastasis | | | (0.001) | |
| Yes | 749 + 409(669 - 829) | 79 6 + 8 9 (62 06-97 07) | | |
| No | $85.6 \pm 1.8(82.09-89.1)$ | 83.9 + 3.4(77.2-90.5) | 2.6 (0.1) | |
| Liver metastasis | 05.0 ± 1.0 (02.0) (09.1) | 03.9 ± 3.1 (11.2 90.3) | | |
| Ves | 71.1 + 3.7(63.8 - 78.4) | $70.6 \pm 7.95(55.06-86.2)$ | 10.27 | |
| No | $87.1 \pm 1.8 (83.5 - 90.7)$ | 84.7 + 4.09(76.7-92.7) | (0.001) | |
| No. of involved lymph nodes | 07.1 ± 1.0 (03.5 70.7) | 01.7 ± 1.09 (10.7 92.7) | (0.001) | |
| | $89.1 \pm 2.09(85.0.93.2)$ | 89.3 ± 5.8 (77.9-100.8) | | |
| 1-5 | 82.96 ± 3.4 (76.3-89.7) | $89.8 \pm 5.4 (79.2 - 100.6)$ | 29.2 | |
| 6-10 | $66.3 \pm 1.6(57.3-75.3)$ | 73.03 ± 6.4 (60.5-85.6) | (0.0001) | |
| > 10 | $63.2 \pm 4.8(53.8-72.6)$ | 64.0 + 6.3(51.7-76.3) | (0.0001) | |
| Zumor grada | $05.2 \pm 4.8 (55.6 - 72.0)$ | $04.0 \pm 0.3 (51.7 - 70.5)$ | | |
| Well differentiated | 80.7 ± 3.1 (74.6.86.8) | 827+66(698956) | | |
| Moderately differentiated | 84.01 ± 2.4 (70.2.88.8) | $82.7 \pm 0.0 (09.8 - 95.0)$ $83.3 \pm 4.4 (74.7, 01.0)$ | 1 27 (0 5) | |
| Poorly differentiated | $767 \pm 602 (64.9.885)$ | 73.03 ± 6.2 (60.8.85.3) | 1.27 (0.3) | |
| Tumor size | 70.7 ± 0.02 (04.9-88.5) | 75.05 ± 0.2 (00.8-85.5) | | |
| $\leq 2 \text{ cm}$ | $03.06 \pm 2.0(88.3.00.6)$ | 03.3 ± 7.5 (78.6.108.0) | | |
| $\geq 2 \text{ cm}$ | $70.3 \pm 2.9(88.3-99.0)$ | 79.3 ± 7.3 (78.0-108.0) 78.7 ± 5.4 (68.02.80.3) | 32.1 | |
| 2-5 cm | $79.3 \pm 2.90 (73.3-63.1)$ $60.0 \pm 2.6 (64.0, 74.05)$ | $76.7 \pm 3.4 (06.02 - 69.3)$ $65.2 \pm 4.08 (57.2, 73.2)$ | (0.0001) | |
| > 5 Cill Skin involvement | $09.9 \pm 2.0 (04.9 - 74.93)$ | $05.2 \pm 4.08 (57.2 - 75.2)$ | | |
| Vos | 70.8 ± 2.2 (66.6.75.06) | $68.07 \pm 3.2(61.8,74.4)$ | 50.7 | |
| I es | $70.8 \pm 2.2 \ (00.0 - 75.00)$ $97.0 \pm 2.3 \ (92.4, 101.6)$ | 127.0 ± 22.8 (82.1.172.6) | (0.0001) | |
| Ninnla involvement | 97.0 ± 2.3 (92.4-101.0) | $127.9 \pm 22.8 (83.1 - 172.0)$ | (0.0001) | |
| Vac | 72.0 ± 2.6 (67.7.78.05) | 72 02 + 5 1 (62 02 82 02) | 14.2 | |
| Tes No | $72.9 \pm 2.0 (07.7 - 78.03)$ | $73.03 \pm 3.1 (03.03 - 63.03)$ | (0,0002) | |
| Turna of traatmont | 00.0 ± 2 (04.9-92.0) | $95.5 \pm 5.5 (82.95 - 105.7)$ | (0.0002) | |
| | 82.7 ± 2.2 (77.2.00.07) | 80.8 +0.4 (71.4 109.2) | | |
| CASACAR S&C&P | $03.7 \pm 3.3 (77.3-90.07)$ $965 \pm 25 (91.6.01.5)$ | $07.0 \pm 7.4 (/1.4 - 100.3)$ $80.3 \pm 5.1 (70.2, 00.2)$ | 25 (0.29) | |
| SACAR C & D | $00.3 \pm 2.3 (01.0 - 91.3)$ | $07.3 \pm 3.1 (77.3 - 77.3)$ | 2.3 (0.28) | |
| | 01.3 ± 2.7 (73.9-80.0) | $10.0 \pm 3.3 (09.7 - 83.3)$ | | |
| Suigely | | | | |

Table 5. Kaplan-Meier analysis of survival time among women diagnosed with cancer breast, El-Minia, Egypt

SE: Standard error, CI: Confidence interval

S & C & R: Surgery and Chemotherapy and Radiotherapy; C & S & C & R: Chemotherapy and Surgery and Chemotherapy and Radiotherapy; S & R: Surgery and Radiotherapy; MRM: Modified Radical Mastectomy; RM: Radical Mastectomy; TM: Total Mastectomy.

 80.9 ± 3.2 (74.6-87.2)

90.97 ± 3.2 (84.7-97.2)

 $85.02 \pm 2.5 \; (80.1\text{-}89.9)$

 $64.1 \pm 5.3 \ (53.8\text{-}74.5)$

84.6 ± 1.7 (81.4-87.9)

 82.7 ± 6.07 (70.8-94.6)

96.4 ± 7.7 (81.3-111.5)

 $84.8 \pm 4.2 \; (76.5 \text{-} 93.07)$

 $57.3 \pm 2.8 \ (51.9 \text{-} 62.7)$

83.8 ± 3.2 (77.6-89.9)

25.4

(0.0001)

Total

MRM

RM

TM

Quadrantectomy

Education may result in a higher degree of health awareness, better perception of breast related symptoms and less delay in seeking medical care.⁸

Housewives and less skilled occupational groups had higher death percentages compared to skilled patients. It remains unclear whether the reason for the disparity is delay in diagnosis or differing biology of cancers in the groups with less education and income compared with more advantaged groups. A study of UK cancer patients had shown that delay of diagnosis and treatment was longer for lower social class groups than higher social class groups and this was also apparent for breast cancer.⁹

Death among patients with breast cancer was higher in rural patients, due to no access to organized mammography screening. This was in agreement with a study conducted by Dalton et al.¹⁰

The most important prognostic factor was the occurrence of distant metastasis. Studies carried out on selected patient groups indicated that long term survival was possible in young patients with limited metastatic disease.¹¹

Our findings revealed that tumor size was significantly associated with breast cancer survival, as patients with tumor size of 5 cm and above had a higher risk of death than those with tumor size 2 cm and less. This result was consistent with another study.¹²

We found that poorly differentiated tumors carried a higher risk of death compared to well-differentiated tumors. This finding was in concordant with a study conducted by Kuru et al.¹³

Death among patients with skin and nipple involvement was higher than among those with free skin and nipple; this was matched with a study examined the clinical, pathological and molecular factors predicting breast cancer in Pakistani women.¹⁴

This study reported that a higher number of positive axillary lymph nodes increased risk of breast cancer-related death. This was in agreement with another study which found that the most important prognostic factor affecting local control, disease-free survival, and overall survival was axillary lymph node metastasis.¹⁵

The number of involved nodes was the most powerful predictor of survival on multi-factorial analysis.¹⁶ According to our findings, not only did node positive patients have a poorer survival rate compared to node negatives, but also as the number of involved nodes increased, the risk of death increased too.

CONCLUSION

Markers of poor prognosis for survival were large tumors, increasing number of positive lymph nodes, grade III tumors, poor socioeconomic status, and variable treatment profiles. Clinical outcomes and survival associated for each prognostic marker were inferior when compared to developed countries due to low level of awareness, lack of screening programs, and subsequent late access to treatment. Population based screening programs, outreach mammography, improvements in technical expertise and quality of care, standardized treatment regimens in a tax-funded health care system need to be developed for countries with limited resources

ACKNOWLEDGEMENTS

We would like to acknowledge the staff of the national institute of oncology center in El-Minia for their help and support.

Conflict of interest statement: All authors declare that they have no conflict of interest.

Source of funding: None.

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