ORIGINAL ARTICLE

Ten-year Survival Rates for Women of Grand Bahama Island, The Bahamas, Diagnosed with Breast Cancer in 1988–2002

AF Brathwaite[1], NV Brathwaite[2]

ABSTRACT

A total of 150 women from Grand Bahama Island, The Bahamas, with cancer of the breast were followed up for 10 years post-diagnosis to assess survival rates, not only generally, but also by age and stage of disease at diagnosis, the presence or absence of axillary lymph node metastases, the treatment modalities received, and the diagnostic periods. The patients' medical records and the death registers of the Medical Records Department of Rand Memorial Hospital (RMH), Grand Bahama Island, supplemented with data from the ledgers of the Pathology Department of RMH and from The Bahamas' national death register, were utilized. By Pearson Chi-square and Kaplan-Meier survival analysis, females who were 40 years old or younger lived significantly longer (71.2% of whom for at least 10 years; mean: 213.8 months) than those who were older than 40 years (42.9% of whom for at least 10 years; mean: 167.9 months). The absence or presence of axillary lymph node metastases also had a bearing on survival, with 71.9% surviving at least 10 years (mean: 243.9 months) versus *32.7% (mean: 108.1 months) respectively. Despite the accepted importance of the diagnostic stage of disease, the small sample size obtained allowed only a limited assessment of the influence of staging on the survival rates. Neither the treatment received nor the diagnostic periods had any significant influence on the survival rates. The establishment of a national cancer registry in The Bahamas would alleviate the problems due to retrieval of information and aid in the better management and follow-up of cancer. Because of a relatively young age at diagnosis, consideration must also be given to beginning mammography screening of Bahamian women at an age below 40 years.*

Keywords: Age, breast cancer, cancer survival rates, Grand Bahama Island

Tasas de diez años de supervivencia en las mujeres de Gran Bahama, Bahamas, diagnosticadas con cáncer de mama en 1988–2002

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RESUMEN

Un total de 150 mujeres con cáncer de mama en Gran Bahama, Bahamas, recibieron un seguimiento de 10 años después del diagnóstico, a fin de evaluar las tasas de supervivencia. La evaluación de las tasas de supervivencia se realizó no sólo de manera general, sino también

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sobre la base de la edad y etapa de la enfermedad en el momento del diagnóstico, la presencia o ausencia de metástasis en los ganglios axilares, las modalidades de tratamiento recibidas, y los períodos de diagnóstico. A tal fin, se utilizaron las historias clínicas de los pacientes y los registros de defunción existentes en el Departamento de Historias Clínicas del Hospital Rand Memorial (HRM) de Gran Bahama, complementados con datos provenientes de los libros de archivo del Departamento de Patología de HRM y el Registro Nacional de Defunciones de Bahamas. Según el análisis de la supervivencia mediante Pearson Chi-Square y Kaplan-Meier, las mujeres de 40 años o más jóvenes vivieron significativamente más tiempo (71.2% de ellas por lo menos diez años; promedio: 213.8 meses) que las mayores de 40 años (42.9% de ellas por lo menos diez años; promedio: 167.9 meses). La ausencia o presencia de metástasis en los ganglios axilares también tuvo una incidencia en la supervivencia, sobreviviendo el 71.9% por lo menos 10 años (promedio: 243.9 meses) frente a un 32.7% (promedio: 108.1 meses) respectivamente. A pesar de la reconocida importancia de la etapa diagnóstica de la enfermedad, el pequeño tamaño de la muestra obtenida permitió sólo una evaluación limitada de la influencia de la estadificación en las tasas de supervivencia. Ni el tratamiento recibido ni los periodos de diagnóstico tuvieron influencia significativa en las tasas de supervivencia. El establecimiento de un registro nacional del cáncer en las Bahamas aliviaría los problemas relacionados con la recuperación de información y ayudaría a un mejor tratamiento y seguimiento del cáncer. Debido a la edad relativamente joven en que realiza el diagnóstico, debe considerarse también comenzar la investigación de la mamografía de las mujeres de las Bahamas antes de los 40 años.

Palabras clave: Edad y cáncer de mama, tasas de supervivencia de cáncer, Gran Bahama

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INTRODUCTION

Cancer of the breast in women is accepted to be a common condition worldwide, both in incidence and mortality (1–3). As noted in a 15-year (1988–2002) epidemiological report on cancers, this is similarly applicable to the entire Bahamas and, likewise, to Grand Bahama Island, the second most populated (2010 Census: 51 400) in the archipelago of the Commonwealth of The Bahamas (4). Of the then reported 162 cases from Grand Bahama Island, 151 were diagnosed in the local pathology department of the Rand Memorial Hospital (RMH), the only such department on the island. Since that report, studies have revealed the presence of genetic mutations and, in particular, a purported high incidence of mutations of the BRCA1 gene (23%) in Bahamian women with breast cancer (5, 6). The above statements carry implications for the residents, health professionals, and administrators and managers of the health system. This is particularly because, as stated, the BRCA gene mutations are associated not merely with a greater than average risk for breast cancer but also the likelihood of occurrence at a younger age.

The objective of this study was to assess the 10-year survival rates of the 150 women (the total number analysed was 150 because a patient had presented a second time with cancer in the other breast). Further, acknowledging the relatively low median age of 48 years at diagnosis and accepting the high prevalence of the stated genetic mutations, this study will also delineate the age distribution of these patients, relating any influence that age, in particular, and likewise stage of disease at diagnosis, axillary lymph node metastases, treatment modalities, and diagnostic periods may have had on these survival rates.

SUBJECTS AND METHODS

The methodology for this retrospective and observational study was an extension of the 1988–2002 study, with final observations made at the end of 2012, 10 years after the last diagnostic year.

Diagnoses and deaths were recorded from the medical records and death registers respectively of the Medical Records Department of RMH. These were supplemented by checks of the ledgers of the Pathology Department of RMH and also The Bahamas' national death register.

The following variables were recorded: age, stage and date at diagnosis, presence of axillary lymph node metastases, treatment modalities, and the diagnostic periods. Age at diagnosis was categorized into two groups: 40 years or under, and over 40 years. Because of the small sample size recorded, stage was recoded into two groups: stages I and II, and stages III and IV. The diagnostic periods were in five-year segments of the 15 years: 1988–92, 1993–97 and 1998–2002. The treatment modalities received were grouped as follows: surgery only; surgery and chemotherapy; surgery, chemotherapy and radiation; and others, which included all other treatment combinations, those without treatment, and those with no data. The mortality data were based on those with death certificates that listed cancer of the breast as the cause of death. Survival was recoded into three periods: survival for fewer than five years, survival for five to nine years and survival for at least 10 years.

Age was further analysed using Mann-Whitney and Kruskal-Wallis non-parametric tests for differences in mean age by stage, axillary lymph node status, treatment modalities, diagnostic period, and survival periods.

The two age groups, along with stage at diagnosis, axillary lymph node status, treatment modalities, and diagnostic period, were first tested by Pearson Chi-square for differences in the three survival periods. In addition, survival was further estimated using Kaplan-Meier Curve, testing for differences in the two age groups, the stage of disease, axillary lymph node status, the treatment modalities received, and diagnostic period. Data entry and statistical analyses were done in IBM SPSS Version 21. Testing for significance was set at 0.05.

The Executive Management Committee of RMH granted permission to use the hospital data.

RESULTS

The total number analysed was 150 because a patient of the original study had presented a second time with cancer in the other breast. The mean age of the women at diagnosis was 48.7 years (median: 48; range: 25–84; standard deviation: ± 13.6); 34.7% of them were 40 years or younger, and 14.0% were 65 years or older (Tables 1, 2). Of the 69 (46%) staged patients, 37 (53.6%) were at stage I or II and 32 (46.4%) at stage III or IV (Table 1). The pathological reports of the 84 (56%) axillary lymph nodes of the specimens examined indicated the presence of metastatic tumours in 52 (61.9%) of them (Table 1). In broad terms, the treatment modalities identified for 149 women were: 45 (30.2%) as surgery only; 37 (24.8%) as surgery and chemotherapy, within which was included hormonal therapy; 18 (12.1%) as surgery, chemotherapy and radiation; while for 49 (32.9%), there was some other treatment combination (4.3%), no treatment or the information was not available (Table 1). For

Table 1: Mean age by stage, lymph nodal status, treatment modalities, diagnostic periods and survival periods

Breast cancer groups		n (%)	Mean age (median)	Mann-Whitney/Kruskal-Wallis *p*-value
All (n = 150)		150 (100)	48.7 (48.0)	Not applicable
Stage (n = 69)	I and II	37 (53.6)	48.4 (48.0)	0.030
	III and IV	32 (46.4)	55.1 (55.5)	
Node (n = 84)	Negative	32 (38.1)	48.4 (48.0)	0.658
	Positive	52 (61.9)	49.6 (49.0)	
Treatment modalities (n = 149)	Surgery only	45 (30.2)	46.7 (47.0)	0.661
	Surgery and chemotherapy	37 (24.8)	50.7 (50.0)	
	Surgery, chemotherapy and radiation	18 (12.1)	47.5 (47.5)	
	Other category	49 (32.9)	49.4 (46.0)	
Diagnostic period (n = 150)	1988–92	39 (26.0)	48.9 (50.0)	0.333
	1993–97	42 (28.0)	46.2 (46.5)	
	1998–2002	69 (46.0)	50.1 (48.0)	
Survival (n = 150)	Fewer than 5 years	57 (38.0)	54.0 (52.0)	< 0.00005
	5–9 years	14 (9.3)	50.6 (49.0)	
	10 years or over	79 (52.7)	44.5 (42.0)	

Table 2: Survival periods by age, stage, lymph nodal status, treatment modalities, and diagnostic periods

Breast cancer groups		n (%)	Survival (%)			Pearson Chi-square *p*-value
			Fewer than 5 years	5–9 years	10 years or over	
All		150 (100)	38.0	9.3	52.7	Not applicable
Age at diagnosis (n = 150)	40 years or under	52 (34.7)	21.2	7.7	71.2	0.003
	Over 40 years	98 (65.3)	46.9	10.2	42.9	
Stage (n = 69)	I and II	37 (53.6)	35.1	5.4	59.5	0.059*
	III and IV	32 (46.4)	62.5	6.3	31.3	
Node (n = 84)	Negative	32 (38.1)	18.8	9.4	71.9	0.002
	Positive	52 (61.9)	51.9	15.4	32.7	
Treatment modalities (n = 149)	Surgery only	45 (30.2)	40.0	6.7	53.3	0.916*
	Surgery and chemotherapy	37 (24.8)	40.5	13.5	45.9	
	Surgery, chemotherapy and radiation	18 (12.1)	33.3	11.1	55.6	
	Other category	49 (32.9)	34.7	8.2	57.1	
Diagnostic period (n = 150)	1988–92	39 (26.0)	38.5	10.3	51.3	0.682
	1993–97	42 (28.0)	35.7	14.3	50.0	
	1998–2002	69 (46.0)	39.1	5.8	55.1	

* Chi-square statistic not reliable due to low cell counts.

comparison, three diagnostic categories of five years each, 1988–92 (39, 26.0%), 1993–97 (42, 28.0%) and 1998–2002 (69, 46.0%), were identified (Table 1).

The effect of age was statistically significant for stage only when these were combined into two groups, I and II (mean age: 48.4 years) and III and IV (mean age: 55.1 years) ($p = 0.030$) and for the three survival periods (mean ages: 54.0, 50.6, 44.5 years) ($p < 0.00005$) (Table 1). Statistical significance was not seen by age for axillary lymph node status, for whereas the mean age of those with metastases was 49.6 years, it was 48.4 years for those without ($p = 0.658$). Statistical significance by age (which ranged from 46.7 to 50.7 years) was also not seen for the different modalities of treatment received nor for the diagnostic periods (with the sequential mean ages of 48.9, 46.2 and 50.1 years) (Table 1).

By the end of 2012, 73 (48.7%) had died from breast cancer. On the national death register, an additional four deaths from the cohort were found, but from non-cancer causes. Thirty-eight per cent had survived fewer than five years, 9.3% had survived five to nine years, and 52.7% had survived at least 10 years (Table 2). Of the 150 cases, 22 were not suitable for Kaplan-Meier because of missing precise dates. The estimates for the 128 showed a mean survival of 187.8 months (95% confidence level (CI): 165.5, 210.1) (Table 3, Fig. 1).

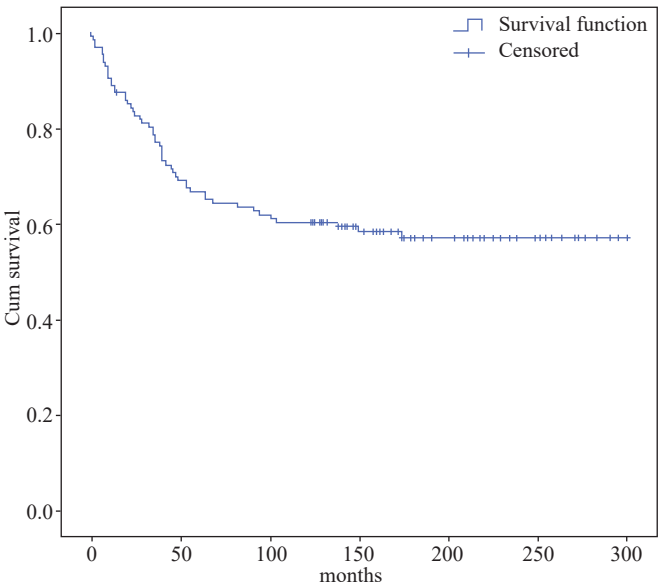

Fig. 1: Kaplan-Meier survival curve of women with breast cancer, overall, Grand Bahama Island.

Of the women aged 40 years or younger, 21.2% had survived fewer than five years, 7.7% five to nine years and 71.2% for 10 years or more. The respective survival periods for females aged over 40 years were 46.9%, 10.2% and 42.9% ($p = 0.003$) (Table 2). Again, the differences by age were borne out with Kaplan-Meier estimation; females aged 40 years or under survived

a mean of 213.8 months (CI: 182.3, 245.3) while for females aged over 40 years, the estimated survival was 167.9 months (CI: 139.0, 196.8) (Table 3, Fig. 2). The log rank statistic showed statistical significance at the 0.05 level ($p = 0.025$).

The combination of the stages of disease into two groups was convenient because of the overall scantiness of the numbers. As seen in Table 2, the analysis approached near statistical significance for influencing the survival rates at the five- and 10-year follow-up divisions ($p = 0.059$). However, as for estimated survival months (Table 3, Fig. 3), statistical significance was not apparent by Kaplan-Meier, where the analysed total numbers were even fewer.

Table 3: Kaplan-Meier estimated mean survival periods (months) of women with breast cancer, Grand Bahama Island, by age, stage, nodal status, treatment modalities, and diagnostic periods

Breast cancer groups		n (%)	Kaplan-Meier mean survival (months)	95% confidence interval	Log rank (Mantel-Cox) *p*-value
All		128 (100)	187.8	165.5, 210.1	Not applicable
Age at diagnosis (n = 128)	40 years or under	47 (36.7)	213.8	182.3, 245.3	0.025
	Over 40 years	81 (63.3)	167.9	139.0, 196.8	
Stage (n = 57)	I and II	34 (59.7)	176.5	137.7, 215.3	0.102
	III and IV	23 (40.4)	125.5	74.9, 176.0	
Node (n = 73)	Negative	29 (39.7)	243.9	207.2, 280.5	< 0.00005
	Positive	44 (60.3)	108.1	78.2, 138.0	
Treatment modalities (n = 127)	Surgery only	39 (30.7)	185.2	145.5, 224.9	0.961
	Surgery and chemotherapy	29 (22.8)	163.6	124.3, 202.9	
	Surgery, chemotherapy and radiation	18 (14.2)	136.9	95.2, 178.7	
	Other category	41 (32.3)	195.1	156.6, 233.5	
Diagnostic period (n = 128)	1988–92	32 (25)	186.8	143.2, 230.4	0.873
	1993–97	39 (30.5)	145.9	115.2, 176.6	
	1998–2002	57 (44.5)	123.2	104.0, 142.5	

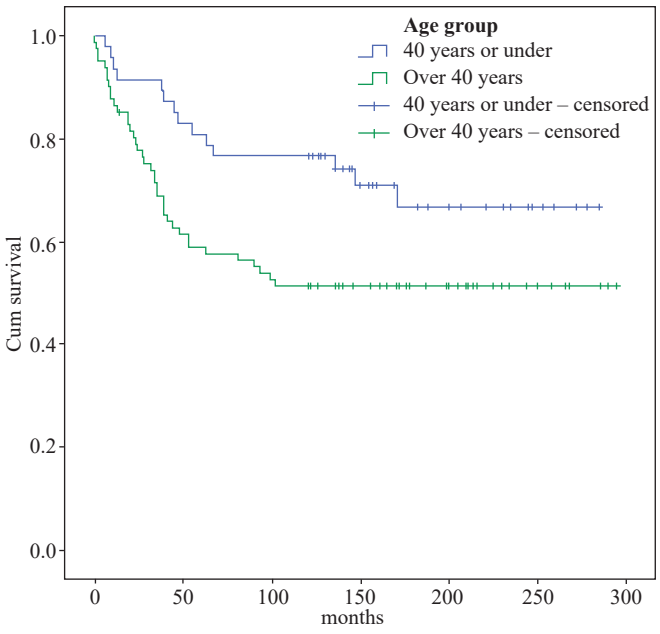

Fig. 2: Kaplan-Meier survival curves of women with breast cancer by age, Grand Bahama Island.

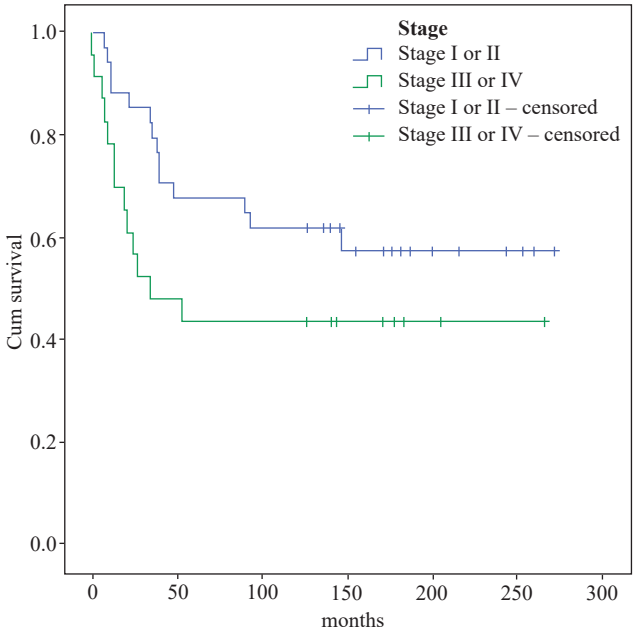

Fig. 3: Kaplan-Meier survival curves of women with breast cancer by stage, Grand Bahama Island.

Although not equivalent to staging, but because somehow related, the axillary lymph nodes were analysed in respect of metastases. For those that were positive for axillary lymph node metastases, 51.9% survived fewer than five years, 15.4% five to nine years and 32.7% at least 10 years. The corresponding data for those without metastases were 18.8%, 9.4% and 71.9% ($p = 0.002$) (Table 2). By Kaplan-Meier, there was statistical significance ($p < 0.00005$), with a mean survival of 108.1 months (CI: 78.2, 138.0) for persons with positive axillary lymph nodes and 243.9 months (CI: 207.2, 280.5) for those whose nodes were negative ($p < 0.00005$) (Table 3, Fig. 4).

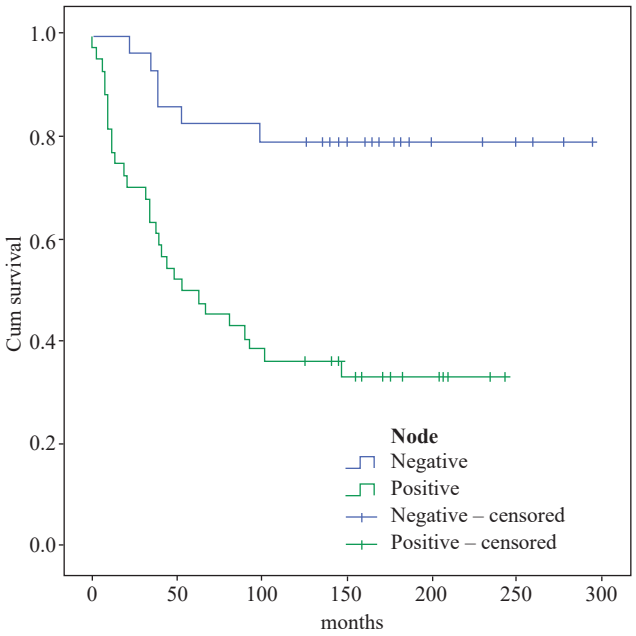

Fig. 4: Kaplan-Meier survival curves of women with breast cancer by lymph nodal status, Grand Bahama Island.

The analysis indicated that there was no influence of treatment modalities received on survival (Tables 2, 3).

For those diagnosed in 1988–92, 61.6% survived at least five years and 51.3% at least 10 years. The matching figures for those diagnosed in 1993–97 were 64.3% and 50.0%, whereas for those diagnosed in 1998–2002, they were 60.9% and 55.1% (Table 2). The mean survival periods were 186.8, 145.9 and 123.2 months for the above diagnostic periods respectively (Table 3). However, neither the Pearson Chi-square nor the Kaplan-Meier analysis demonstrated any statistically significant differences.

In summary, Tables 1–3 demonstrate that differences in five- and 10-year survival rates showed statistical significance for the two selected age groups (40 years or younger, and over 40 years) by both Chi-square and Kaplan-Meier applications, and by the metastatic status of axillary lymph nodes, despite not knowing the stage of the cancer. Near statistical significance in Chi-square, but none by Kaplan-Meier, was seen for the combined stages. There was no statistical significance in the analyses for the treatment modalities received and for the five-year diagnostic periods.

DISCUSSION

Accepting that this present study was one with a small sample size and for only one island of the Bahamian chain, we nevertheless suggest that it perhaps reflected an image of breast cancer for the entire Bahamas and may well serve as a template for future comparisons.

The mean age at diagnosis of breast cancer for this cohort of women was 48.7 years, with most women aged over 40 years. Nevertheless, close to 35% of the women were aged 40 years or younger. This has relevance, not just for the recommended age at which screening for breast cancer should begin, but also, from the familial aspect, if counselling of persons becomes necessary. The American Cancer Society had previously recommended that screening mammography for women at average risk should begin at age 40 years and, more recently, in 2015, at age 45 years (7, 8). In The Bahamas, the guideline of screening at age 40 years has been routinely followed. However, one must remain cognizant that whereas the average age at diagnosis for American women with breast cancer is 61 years, 62 years for Caucasian women and 58 years for African-American women, the comparative age of 48.7 years in the present study, and 42 years for all Bahamas, is considerably lower (9, 10).

Continuing with the age comparisons, and within the Caribbean, the age distribution was different in Dominica, where the mean age for female breast cancer at diagnosis was at 52.5 years, with no one aged 30 years or younger; likewise, in Barbados, the median age was 54 years, and in Jamaica, 58 years (11–13). Interestingly, over an earlier time period of the 1980s, Brathwaite reported a mean age at diagnosis of the Bahamian female patients with breast cancer of 44.9 years, and even then there were cases below the age of 30 years (14).

The reported high incidence of the BRCA1 gene mutations, when coupled with the near 35% occurrence of breast cancer at age 40 years or younger, strongly suggests that the Bahamian woman should be categorized as at a higher than average risk for the onset of breast cancer, consequently necessitating that screening mammography should routinely begin at an earlier age,

perhaps at age 30 years, as 8% of the women were 30 years or younger.

If cancer is discovered at this earlier age or if the family history has placed one in this higher risk category, then further studies (including genetic testing) may be offered, and an assessment of risk, consequences and options may be determined for the family. This approach is preferably being proposed because mammography is already readily available in The Bahamas and is presently less costly than genetic studies.

One may well wonder whether or not these matters are peculiar to the Bahamian population, which is considered predominantly black. How widely such genetic studies may have been performed elsewhere in nearby countries is not known, but BRCA mutations are cited to be low in Cuba (2.6% of females with breast cancer) and likewise in Brazil (2.3% of females with breast cancer), both countries with high populations of African origin (6).

Despite the present emphasis on the younger age groups, suitable guidelines for screening for all age categories are also necessary, considering that 65% of the women were aged over 40 years (25% aged 41–50 years, 19% 51–60 years, 21% over 60 years and 14% over 65 years).

In an unpublished presentation (International Medical Conference, University of the West Indies Medical Alumni Association, November 2013), AF Brathwaite reported a five-year survival rate from this data of 67.5% at the end of 2007. The present rates are stated differently here, in three categories (fewer than five years, five to nine years, and 10 years or more). Therefore, the present reference of overall survival for at least five years denotes the combination of the second and third categories in Tables 2 and 3 and is here presented as 62% (average: 16 years). More significantly, the results indicated that age at diagnosis was a predictor for survival, for whereas survival for at least five years for women aged 40 years or younger was 79% (average: 18 years), it was 53% (average: 14 years) for the older counterparts. The corresponding numbers for the 10-year survival were 53% (average: 15 years) overall, 71% (average: 18 years) for persons aged 40 years or younger and 43% (average: 14 years) for those over 40 years of age.

In the present study, the five-year-and-beyond survival rate of 79% in the women aged 40 years or younger bears similarity to the overall rates of some European countries, which improved from about 73% to 82% (1995–99), with England at 77.3% (15). In the same report, corresponding data from the United States of America (USA) indicated that the five-year relative survival rate in 2006 was 90.6%, rising steadily from 78.4% in 1985 to 89.5% in 1998. However, in the USA, there was some disparity between Caucasian and African-American women, and seemingly for various reasons, the death rates were higher and survival rates lower in African-Americans (16, 17). Within the Caribbean, Cuba had an estimated five-year survival of 70% (1994–95) (18).

It is appreciated that literature sources for 10-year survivals are rarer than those for five-year survivals. The present study states a 10-year survival of 53%. This is low when assessed with data from the USA. A 2011–12 report indicated a 10-year relative survival rate of the general population as 82%; and from a large treatment centre, it was 76.5% (1995–2004) for female breast cancer (19, 20). For England and Wales, the 10-year net survival climbed from 60.0% (1990–91, not too unlike our present data) to 71.5% (2000–01) and to 78.4% (2010–11) (21).

In accepting this influence of age as presented here, one may advance different reasons to account for it. Apart from just being older (since the likelihood of death increases with age), the presence of comorbid conditions may likewise negatively influence longevity of life in an older age group. There is belief that older persons may not wish to be a bother and may well try home remedies, thereby delaying their presentations to the health services. In a USA study, it was noted that the outcomes for the women diagnosed with breast cancer worsened after the age of 65 years. It was surmised that their treatment may have been less aggressive than for a younger woman (22). Whether or not the 14.0% of the Grand Bahamian women aged 65 years or older were likewise affected was not determined. Younger women, whether BRCA gene mutations present or not, may well be more attuned to public educational presentations, performing self-examinations, as well as having clinical examinations and getting mammograms as necessary, thereby presenting earlier with less advanced tumours than older women and hence showing better survival rates.

However, unlike the observations in the present study, contrary views have been advanced elsewhere. In the USA, it has been stated that women diagnosed under the age of 40 years tend to have lower survival rates than those aged 40 years or over. The reasons given are that the younger women have denser breast tissue, making it more difficult for mammograms to detect tumours, and the tumours in the younger women tend to be more

aggressive, spread faster and expectedly show a greater tendency to recur (15–17). A study from Sweden had similar results, but also noted that reports relating the influence of age at diagnosis to survival were conflicting, primarily because the variables were not always identical (23).

Based on the above data, it is clear that the average basic survival rates of Grand Bahamian women, even though dating back to an earlier period beginning in the late 1980s, should be improved and hopefully have already improved, particularly with the public educational emphasis on early detection. In general, different factors have resulted in the improvement of the prognosis for breast cancer, including better screening and refinement or advances in therapeutic options. It has been reported that in The Bahamas, almost 45% of women had late stage disease at diagnosis (9) – this is of grave consequences. This probably is similarly applicable to Grand Bahama Island, where the present study showed only 12% presented as stage I.

In respect of staging, Connolly has detailed the problems that may arise in the staging of breast cancer (24). Nonetheless, staging is recognized as perhaps the most important determinant and predictor of the outcome for women with breast cancer (1). The crude results from Grand Bahama Island (reported in an unpublished presentation, based on the already mentioned epidemiological study, University of the West Indies Medical Alumni Association Scientific Meeting, July 2008) demonstrated the expected negative association between advanced stages and survival: at the end of the diagnostic period in 2002, the overall mean survival was approximately four years, with stage I at seven years, stage II four years, stage III three years and stage IV three years. In addition, there was near statistical significance when the stages were combined. Nevertheless, statistical significance was not demonstrated over the data for the ensuing 10-year follow-up. There was also no statistical significance from the data of the modalities of treatment received and for the diagnostic periods.

The results on the status of axillary lymph nodes were limited, stating merely the presence or absence of metastases, with no cross-reference to other factors, such as the size and type of the primary tumour, hormone receptor status, number of axillary lymph nodes involved or the spread of the cancer elsewhere. Nevertheless, the raw comparison, as expected, showed that the presence of axillary lymph node metastases significantly altered survival negatively (Fig. 4).

Adding to the small sample size, other limitations of this study included internal migration of residents and the inability to locate medical records as time passed. Nevertheless, as the Medical Records Department of RMH served as a depository for all deaths on Grand Bahama Island and when linked with a review of the national death register, we accept that persons listed as having died were such. However, accepting the corollary that all others were alive is debatably questionable, even though it was on this basis that the presented survival rates were calculated. In fact, at the end of the 10-year follow-up period, only 14% of the patients were certainly known through their medical records to be alive. Therefore, the 48.7% mortality indicated that some 37.3% of persons were no longer then accounted for at the RMH. If perhaps there was failure in identifying all the women who had died, then the survival rates would be even more dismal than as presented here. Of interest, but not a part of this study, the records indicated that an additional 36 deaths from breast cancer had occurred from 2003 to 2012, most probably of persons diagnosed after 2002.

Having been diagnosed on Grand Bahama Island, many persons opted for further assessment, treatment and management elsewhere, particularly in South Florida, USA, with which established links had long existed, but also within The Bahamas, in the capital city of Nassau, on New Providence Island. Hence, in listing the different treatment modalities, it should be understood that these were not all offered at the same time or place. The initial surgery, usually a resection or a form of mastectomy, was perhaps the sole type of treatment given on the island, generally performed shortly after diagnosis. Understandably, many persons became lost to the Grand Bahama Health Services, perhaps until death, having sought multi-mode therapy elsewhere.

It must be proffered that mastectomy specimens were received in 84 (56%) cases. Should it therefore be assumed that 66 (44%) women either travelled elsewhere for their entire management or, for whatever reason, did not seek or were not offered surgery or the other established modalities of treatment? As shown in Table 2, if one assumes that all persons, except those that had surgery only, (45, 30.2%) had travelled elsewhere for treatment, then almost all (104, 69.8%) had returned to the local hospital to begin with. Loss to follow-up would have come later. Additionally, that only a small number (69, 46%) of the presenting patients were staged may be a reflection of the small numbers that had surgery only on Grand Bahama Island.

When the modalities of treatment received were analysed by stage of disease, persons in all four main stages were present within the three identified specific treatment modalities. Interestingly, however, the three (4.3%) women who were in the category of other treatment combination were all in stage IV, implying that the standard identified approaches were bypassed.

Because of the interest generated through a superficial look at the initial results, and changes related to staffing and in the hospital management systems, it was decided to review the data in five-year diagnostic periods. The statistical analyses demonstrated no significant differences in survival rates of the three five-year segments within the initial 15-year period.

CONCLUSION

One strongly suggests the establishment of a national cancer registry, properly staffed and equipped, and with the appropriate guidelines for gathering the necessary information and on the adequate follow-up of patients. Linked with the education and training of health personnel and enlightenment of the general public, this step will serve as a useful tool for awareness, knowledge and the general management of cancer. In this regard, we would be in a better position to make more meaningful comparisons of our national data over time and with those of other countries. A responsible medical body should propose clear guidelines and policies, other than the occasional statements, for the screening of breast cancer in The Bahamas.

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