

Clinical Presentation, Prevalence and Management of Breast Cancer in Sokoto, Nigeria

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Abstract

Background: In recent times there have been increased cases of malignant breast diseases presenting to the surgical out-patient department of the Usmanu Danfodiyo university teaching hospital, Sokoto, Nigeria. The hospital receives referrals mainly from the neighboring state of Kebbi and occasionally from Zamfara. Unfortunately, majority of the patients present late with attendant poor outcome.

Objectives: To determine the clinical presentation, prevalence and management outcome of malignant breast diseases in Sokoto, Nigeria.

Method: A retrospective review of case notes of all patients with histologically confirmed breast diseases between 2007 and 2011 was carried out. Data studied included demographic characteristics, stage at presentation, management and follow up. Results were analyzed using the windows SPSS Statistics 17.0.

Results: A total of 1822 patients were seen, out of which 816 (44.8%) had malignant breast disease and 1006 (55.2%) had benign disease. 288 women had breast cancer in 2011 (new and pre-existing cases) giving a prevalence rate of 10.4 cases per 100,000. The Male: Female ratio for breast cancer was 1: 203. The mean and modal age group for breast cancer was 41-50 years. Invasive ductal carcinoma was responsible for 800 (98%) of cases seen. Invasive lobular carcinoma followed with 12 (1.5%) cases. 452 (55.4%) patients presented with stage 3C (T4B, N3, M0) disease while 359 (44.0%) patients presented with stage 4 (T4C, N3, M1) disease. Only 5 (0.6%) patients presented with stage 2B (T3A, N1B, M0) disease. No patient was seen with stage 1 disease during the five year study period. Modified radical mastectomy was offered to 414 (50.7%) patients, while 200 (24.5%) patients had toilet mastectomy. Immediate post-operative mortality was 0.8% (5 cases). However, 67 (8.2%) patients died before they were offered surgery. The overall mortality therefore was 9.0% (72 cases). Follow up studies showed that 402 (53.7%) patients were seen during the first year follow up, while 88(11.7%) patients were seen during the second year. No patient was seen in the third year of follow up.

Conclusion: The prevalence rate of breast cancer in Sokoto in 2011 was 10.4 per 100 000 women. Late presentation was the norm with 99.4% (811) presenting with advanced disease (TNM stages 3 and 4) and 0.6% (5) presenting with stage 2 disease. Breast cancer therefore continues to carry poor prognosis in this part of the country.

Keywords: Breast cancer; Late presentation; Women

Introduction

Breast cancer is the commonest female malignancy globally [1]. In Nigeria breast cancer has overtaken cervical cancer as the leading female malignancy [2]. It is also the commonest cancer among women in South Africa [3]. Breast cancer cases have increased in hitherto low incidence areas of Asia and Africa due to "Westernized lifestyle" and better reporting of the disease [4]. In Nigeria as in most developing countries, late presentation with unfavorable prognosis is common [5-7]. The African patient is likely to present with a more aggressive tumor than her Western counterpart and is likely to die from the disease [7]. Several works have shown that basal-like tumors occur significantly higher among pre-menopausal African-American and African women [8-11]. Ikpat et al. [12] found that tumors of Nigerian women had less tubular differentiation and higher mitotic to apoptotic index compared to Finnish women. However these views are by no means universally accepted as recent works by several authors have shown that there was no difference in the pattern of hormone receptors in breast cancer patients of African origin compared to other populations [13]. They are of the view that the poor prognostic features of tumors of African origin are only a reflection of the late stage at diagnosis, non-availability of screening methods and the adverse influence of lack of awareness of the disease and some other epidemiological risk factors [13,14]. Breast cancer is therefore considered a complex and heterogeneous disease with ethnic and racial variations of histological subtypes and tumor behavior which must be clearly defined for maximal benefit to

the patient [15,16]. The burden of management of breast cancer in a resource limited country like Nigeria weighs heavily on the patient who is likely to be poor, illiterate and has no form of health insurance. She is therefore forced to seek cheaper alternative treatment and only come to hospital as a last resort and with advanced disease.

Methodology

This was a retrospective study in which the case note of all patients with histologically confirmed neoplastic breast diseases seen in the surgical out-patient department of a tertiary hospital in north-western Nigeria, between 2007 and 2011 were retrieved and reviewed. Demographic characteristics, the clinical stage at presentation, management (including operative procedures and chemo-radiotherapy) and follow up of the patients were studied.

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Inclusion/exclusion criteria

All patients with histologically confirmed neoplastic breast diseases were included in the study. Patients with breast lesions not confirmed histologically and those with histologically confirmed non-neoplastic lesions were excluded from the study.

Staging characteristics

The TNM staging classification was used and clinical stages were grouped as: early stage (stages 1 and 2A), advanced (2B and 3C) and metastatic (stage 4). Bivariate analysis showed no significant relationship between age and clinical stage at presentation. Frequencies were presented as absolute values and percentages.

Receptor status

Measurement of receptor status was yet to commence at the time of the study and so no record of receptor status was seen in the case notes reviewed. All results were analyzed using the windows SPSS statistics 17.0.

Results

A total of 1822 patients were seen out of which 816 (44.8%) had malignant breast disease while 1006 (55.2%) had benign disease, giving a benign: malignant ratio of 1.2:1. Table 1 shows the overall distribution of malignant breast diseases in Sokoto over a 5 year period. There was an increasing trend in cases of breast cancer seen over the study period with 288 seen in 2011 (new-206 and pre-existing cases-82). The prevalence of breast cancer in 2011 was 10.4 per 100,000 women. The denominator for calculating prevalence was the population figure of 2,781,416 women from the 2006 population census for Sokoto and Kebbi states (the states served predominantly by the hospital). 4 male patients had Invasive ductal carcinoma giving a male: female ratio of 1: 203.

The mean and modal age group was 41-50 years. Mean age was 48.2 years (Table 2). Invasive ductal carcinoma was the most commonly diagnosed histological type, 800(98%), followed by invasive lobular carcinoma, 12 (1.5%) (Table 2). 452 (55.4%) patients presented with TNM stage 3C (T4B, N3, M0) disease while 359 (44.0%) patients presented with stage 4 (T4C, N3, M1) disease. Only 5 (0.6%) patients presented with stage 2B (T3A, N1B, M0) disease. No patient was seen with stage 1 disease (Table 3). There was 100% positive axillary lymph node. There was no significant relationship between the clinical stage of breast cancer and the age of patients seen (p value>0.05) (Table 4). Modified radical mastectomy was offered to 441 (54.0%) patients, while 200 (24.5%) patients had toilet mastectomy. All the patients operated were started on adjuvant chemotherapy using cyclophosphamide, doxorubicin and 5-fluorouracil but compliance was poor due mainly to financial difficulties. Patients were routinely placed on tamoxifen because the receptor status could not be determined. None however

Year	Malignant Breast Disease
2007	109
2008	132
2009	121
2010	166
2011	288
TOTAL	816

Table 1: Overall Distribution of Malignant Breast Diseases in Sokoto over a 5 Year Period.

received monoclonal therapy. Neo-adjuvant chemotherapy was given to 311(38.1%) patients to down-regulate the tumor while waiting for surgery, but none received neo-adjuvant radiotherapy. All the patients operated were referred for adjuvant radiotherapy. 5 (0.8%) patients died post operatively from overwhelming tumor burden and multiple organ failure. However, 67 (8.2%) patients died before surgery (from metastatic disease). The overall mortality therefore was 9.0% (72) (Table 5). 402 (49.3%) patients were seen in the first year of follow up while 88 (10.8%) patients were seen in the second year. No patient was seen after the third year.

Discussion

The study shows that breast cancer constitutes 44.8% (816) of all breast diseases seen, while benign breast disease was 55.2% (1006). The benign: malignant (B:M) ratio was 1.2:1, in contrast to most reports in Nigeria where benign diseases predominates [17-20]. Ochicha et al. [17] in Kano noted that benign breast disease accounted for 71.9% of breast diseases in women with a B: M ratio of 2.6:1. Fibrocystic disease was the commonest histological type seen in that study comprising 34.3% (55) of all the cases, and with a mean age of 33 years. This was followed by fibroadenoma with 28.8% and mean age of 21 years [17]. Fibroadenoma was also the commonest benign breast disease in our study accounting for 95.4% (960) and with mean age range of 11-20 years [18-20].

The prevalence rate of breast cancer in 2011 from our study was 10.4 per 100,000 women. This is the first hospital based figure on breast cancer prevalence from our center. Most figures within and outside Nigeria suggest a rising incidence of breast cancer due largely to "Westernized lifestyle" and better reporting of the disease [4,21-23]. Jedy Agba et al. [24] reported an age standardized incidence rate (ASR) of breast cancer of 52.0 per 100,000 women in Ibadan, Nigeria and 64.6 per 100,000 women in Abuja, Nigeria and concluded that there was substantial increase (compared to previous studies) in incidence of breast cancer in Nigeria.

Breast cancer incidence in Uganda doubled from 11 per 100,000 women in 1961 to 22 per 100,000 women in 1995 [25]. The incidence in developed countries like the USA and UK is much higher ranging between 50 and 100 per 100,000 women and was responsible for up to 375,000 deaths in the USA in 2000 [26,27].

Globally, 1.4 million women were diagnosed with breast cancer in 2008 with approximately 459,000 deaths [28,29]. Of these approximately 450,000 were diagnosed with the disease in Europe with 140,000 deaths, while 68,000 women were diagnosed with the disease in Africa with corresponding 37,000 deaths [28,29].

The predominant histological type of invasive ductal carcinoma in our study is not different from other findings in the country and elsewhere [21,30,31]. The study also shows that breast cancer occur in younger age (mean age 48.2 years) among our women than in Caucasians [21]. Most published works in Nigeria and America reveal that breast cancer in African women occur a decade earlier than the western average [21,32,33]. African-American women also present at significantly younger age than their Caucasian counterparts [34,35].

Similarly, black British women presented significantly younger (median age of 46 years), than white patients (median age of 67 years) [36].

The factors responsible for this are not fully understood although it may be due to mutations in the breast cancer genes (BRCA 1 and 2)

AGE GROUP (Years)	11 - 20	21-30	31 - 40	41 - 50	51 - 60	61 - 70	71 - 80	Total	Grand
Histologic Type Sex	M F	M F	M F	M F	M F	M F	M F	M F	
Invasive ductal carcinoma	0 2	0 22	1 163	0 362	1 176	1 51	1 20	4 796	800
Invasive lobular carcinoma	0 0	0 0	0 4	0 7	0 1	0 0	0 0	0 12	12
Fibrosarcoma	0 0	0 0	0 0	0 2	0 0	0 0	0 0	0 2	2
Malignant phylloides tumor	0 0	0 0	0 0	0 2	0 0	0 0	0 0	0 2	2
Total	0 2	0 22	1 167	0 373	1 177	1 51	1 20	4 812	816
Grand total	2	22	168	373	178	52	21	816	816

M= Males, F= Female

Table 2: Histological diagnosis, age and sex distribution of patients seen over a 5 year period.

Staging (AJCC)	Frequency	%
I	0	0
II A	0	0
II B	5	0.6
III A	0	0
III B	0	0
III C	452	55.4
IV	359	44.0
Total	816	100.0

Table 3: TNM staging classification of patients seen during the 5 year study period.

and their variants [35]. A study in America shows that most African-American patients have mutations in BRCA 2 while mutations in the white women were in BRCA 1, and almost half of the African-American women had variants of uncertain significance compared to only 12% of the white cohorts [37]. Unfortunately, not much genetic work has been done on non-migrant African women. A Multi Centre research into the genetics of breast cancer among African women therefore may reveal mutations currently unknown.

The stage at presentation of breast cancer in this study was abysmal. No patient was seen with stage 1 disease in the 5 year study period. 99.4% presented with late disease (55.4%, stage 3c and 44.0% stage 4) and 0.6% (5) presented with stage 2b disease. There was 100% positive axillary lymph node.

This is the usual finding in most developing countries with attendant poor outcome [21,30,32]. Anyanwu in Nnewi, Nigeria reported 3% stage 1, 24% stage 2 and 72% advanced stage (68% stage 3 and 4% stage 4) while Ntekim et al. [21,30] in Ibadan, Nigeria got 2%(5) stage 1, 13%(29) stage 2 and 85% late stage (46%{102} stage 3 and 39%{85} stage 4). Ohene-Yeboah and Adjei [38] in Kumasi, Ghana reported that 85.2% (281) of patients presented with stages 3 and 4 disease; and 82.1% (271) and was invasive while 85.2% (230) was high grade. Sharma et al. [39] concluded in their study that poverty and lower education level were the chief reasons for delays in presentation. Other reasons for late presentation in Africa includes, ignorance, illiteracy, denial, fear of the consequences, and resort to cheaper alternative treatments like herbal, traditional or faith healing [40,41]. Causes of delay in presentation in Latin American countries like Colombia and Argentina includes old age, lack of social security and advanced clinical stage [42]. Other reasons include painless lump, fear of diagnosis, time constraints and lower educational level [42].

Studies have shown that black women in Europe exhibit similar pattern of disease to African women than to white European women suggesting a possible genetic link [43]. Black British and American women present with more advanced disease than white women [33,36]. Pre-menopausal African-American women have higher prevalence of triple negative (basal-like) breast tumours, than their

white counterparts [43], and this trend has also been seen among African women [32].

Breast cancer among our patients therefore present late and tend to run an aggressive course. Public health education and advocacy are the only ways to bring about positive change and improve outcome [44]. Dedicated breast cancer screening and treatment centers should be set up across the country to detect the disease early.

Surgery was the most common palliative treatment offered, and this was often followed by adjuvant chemo-radiotherapy, but compliance was poor due to financial difficulties. The mortality figures and the high number of patients lost to follow up are true reflections of the abysmal outcome of cancer management in our environment. Most of the patients lost to follow up are presumed dead or too discouraged to continue hospital treatment due to mounting expenses. Most of our patients have no form of health insurance cover and therefore bears the financial cost of treatment directly. Almost all patients (99.9%) treated were lost after the second year of follow up.

The five year survival estimates for parts of Africa was 12% compared to 90% in the USA, Australia and Canada where cancers are detected early and patients have ready access to treatment [28]. Actual survival in this study was therefore difficult to determine because of the frequent loss of patients to follow up. The 5 year survival rates for patients with stages 1, 2, 3 and 4 breast cancer in a hospital in Brazil between 1990 and 1994 were 90%, 78.9%, 47.4% and 14.9% respectively [45]. The age-adjusted mortality rate for Argentina and Uruguay in 2004 was 20/100 000 and 24/100 000 respectively, with mean age at death from breast cancer being 66.4 years for Argentina and 63.2 years for Uruguay [46]. However, overall survival estimates for Latin America hardly exceeds 70% [46].

With the predicted rise in incidence of breast cancer in parts of Asia and Africa, due largely to "Westernized life style", the burden of management of breast disease will continue to pose a great challenge to the surgeon [28], and unless measures are put in place for early detection, and easy accessibility to treatment, the prognosis of breast cancer will continue to be poor in a resource limited economy like Nigeria.

Age (Yrs)	Stages 1 - 2	Stages 3 – 4	P value
	N (%)	N (%)	
≤ 50	4 (0.7)	561 (99.3)	>0.05
>50	1 (0.4)	250 (99.6)	

Table 4: Association between breast cancer stage and age of patients.

s/no	Stage of Mortality	Frequency (%)
1	Pre-operative	67 (8.2)
2	Post-operative	5 (0.8)
Total		72 (9.0)

Table 5: Mortality pattern of Breast cancer patients as seen in relation to the operative period.

Conclusion

The prevalence rate of breast cancer in Sokoto in 2011 was 10.4 per 100,000 women. Late presentation was the norm with 99.4% (811) presenting with advanced disease (stages 3 and 4) and 0.6% (5) presenting with stage 2 disease. Aggressive public health campaigns with emphasis on screening and easy accessibility to treatment is the only way to reverse the trend.

Limitations of the Study

The manual system of storage of information by the medical records department makes retrieval of case files earlier than 2007 a challenging task. A ten year study period would have meant a larger sample size and longer period of evaluation. Frequent loss of patients to follow up with associated missing data made actual survival estimation difficult in this study.

References

- Forbes JF (1997) The incidence of breast cancer: the global burden, public health considerations. *Semin Oncol* 24: S1-20-S1-35.
- Solanke TF, Adebamowo CA (1996) Report of the state of the art in oncology in Ibadan and Ife. National headquarters of cancer registries in Nigeria. UCH Ibadan.
- Hoffman M, de Pinho H, Cooper D, Sayed R, Dent DM, et al. (2000) Breast cancer incidence and determinants of cancer stage in the Western Cape. *S Afr Med J* 90: 1212-1216.
- Yip CH, Taib NA (2012) Challenges in the management of breast cancer in low- and middle-income countries. *Future Oncol* 8: 1575-1583.
- Gukas ID, Jennings BA, Mandong BM, Igun GO, Girling AC, et al. (2005) Clinicopathological features and molecular markers of breast cancer in Jos, Nigeria. *West Afr J Med* 24: 209-213.
- Amir H, Kitinya JN, Parkin DM (1994) A comparative study of carcinoma of the breast in an African population. *East Afr Med J* 71: 215-218.
- Gakwaya A, Kigula-Mugambe JB, Kavuma A, Luwaga A, Fualal J, et al. (2008) Cancer of the breast: 5-year survival in a tertiary hospital in Uganda. *Br J Cancer* 99: 63-67.
- Mbonde MP, Amir H, Schwartz-Albiez R, Akslen LA, Kitinya JN (2000) Expression of estrogen and progesterone receptors in carcinomas of the female breast in Tanzania. *Oncol Rep* 7: 277-283.
- Gao Q, Adebamowo CA, Fackenthal J, Das S, Sveen L, et al. (2000) Protein truncating BRCA1 and BRCA2 mutations in African women with premenopausal breast cancer. *Hum Genet* 107: 192-194.
- Chen VW, Correa P, Kurman RJ, Wu XC, Eley JW, et al. (1994) Histological characteristics of breast carcinoma in blacks and whites. *Cancer Epidemiol Biomarkers Prev* 3: 127-135.
- Chhanda B (2010) Clinico-pathologic features of female breast cancer in Kumasi, Ghana. *Int J Cancer Research* 6: 154-160.
- Ikpatt F, Kuopio T, Erekul A, Collan Y (2002) Apoptosis in breast cancer: Nigerian vs. Finnish material. *Anal Quant Cytol Histol* 24: 73-80.
- Adebamowo CA, Famooto A, Ogundiran TO, Aniagwu T, Nkwodimmah C, et al. (2008) Immunohistochemical and molecular subtypes of breast cancer in Nigeria. *Breast Cancer Res Treat* 110: 183-188.
- Awadelkarim KD, Arizzi C, Elamin EO, Hamad HM, De Blassio P, et al. (2008) Pathological, clinical and prognostic characteristics of breast cancer in Central Sudan and Northern Italy: implications for breast cancer in Africa. *Histopathology* 52: 445-456.
- Carey LA, Perou CM, Livasy CA, Dressler LG, Cowan D, et al. (2006) Race, breast cancer subtypes, and survival in the Carolina Breast Cancer Study. *JAMA* 295: 2492-2502.
- Okobia M, Bunker C, Zmuda J, Kammerer C, Vogel V, et al. (2006) Case-control study of risk factors for breast cancer in Nigerian women. *Int J Cancer* 119: 2179-2185.
- Ochicha O, Edino ST, Mohammed AZ, Amin SN (2002) Benign breast lesions in Kano. *Nig J Surg Research* 41: PP. 1-5.
- Otu AA (1990) Benign breast tumours in an African population. *J R Coll Surg Edinb* 35: 373-375.
- Oluwole SF, Fadiran OA, Odesanmi WO (1987) Diseases of the breast in Nigeria. *Br J Surg* 74: 582-585.
- Okobia MN, Osime UA (1998) A clinicopathological study of benign breast diseases in Benin City, Nigeria. *Nig J Surg* 5: 64-68.
- Anyanwu SN (2000) Breast cancer in eastern Nigeria: a ten year review. *West Afr J Med* 19: 120-125.
- Lambo EO (2007) Press release on state of Health in Nigeria.
- Ihekwa FN (1992) Breast cancer in Nigerian women. *Br J Surg* 79: 771-775.
- Jedy-Agba E, Curado MP, Ogunbiyi O, Oga E, Fabowale T, et al. (2012) Cancer incidence in Nigeria: a report from population-based cancer registries. *Cancer Epidemiol* 36: e271-278.
- Wabinga HR, Parkin DM, Wabwire-Mangen F, Namboozee S (2000) Trends in cancer incidence in Kyadondo County, Uganda, 1960-1997. *Br J Cancer* 82: 1585-1592.
- Althuis MD, Dozier JM, Anderson WF, Devesa SS, Brinton LA (2005) Global trends in breast cancer incidence and mortality 1973-1997. *Int J Epidemiol* 34: 405-412.
- Bray F, McCarron P, Parkin DM (2004) The changing global patterns of female breast cancer incidence and mortality. *Breast Cancer Res* 6: 229-239.
- Youlten DR, Cramb SM, Dunn NA, Muller JM, Pyke CM, et al. (2012) The descriptive epidemiology of female breast cancer: an international comparison of screening, incidence, survival and mortality. *Cancer Epidemiol* 36: 237-248.
- Ferlay J, Shin H R, Bray F, Forman D, Mathers C, et al. GLOBOCAN 2008 vl. 2, Cancer incidence and mortality worldwide. IARC Cancer base No.10 International Agency for Research on cancer, Lyon, France, 2010.
- Ntekim A, Nufu FT, Campbell OB (2009) Breast cancer in young women in Ibadan, Nigeria. *Afr Health Sci* 9: 242-246.
- Kakarala M, Rozek L, Cote M, Liyanage S, Brenner DE (2010) Breast cancer histology and receptor status characterization in Asian Indian and Pakistani women in the U.S.--a SEER analysis. *BMC Cancer* 10: 191.
- Adebamowo CA, Adekunle OO (1999) Case-controlled study of the epidemiological risk factors for breast cancer in Nigeria. *Br J Surg* 86: 665-668.
- Joslyn SA, West MM (2000) Racial differences in breast carcinoma survival. *Cancer* 88: 114-123.
- Elmore JG, Mocerri VM, Carter D, Larson EB (1998) Breast carcinoma tumour characteristics in black and white women. *Cancer* 83: 2509-2515.
- Gao Q, Neuhausen S, Cummings S, Luce M, Olopade OI (1997) Recurrent germ-line BRCA1 mutations in extended African American families with early-onset breast cancer. *Am J Hum Genet* 60: 1233-1236.
- Bowen RL, Duffy SW, Ryan DA, Hart IR, Jones JL (2008) Early onset of breast cancer in a group of British black women. *Br J Cancer* 98: 277-281.
- Haffty B G, Silber A, Matloff E, Chung J, Lannin D (2006) Racial differences in the incidence of BRCA 1 and BRCA 2 mutations in a cohort of early onset breast cancer patients: African-American compared to White women. *J Med Genet* 43: 133-137.

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38. Ohene-Yeboah M, Adjei E (2012) Breast cancer in Kumasi, Ghana. *Ghana Med J* 46: 8-13.
 39. Sharma K, Costas A, Shulman LN, Meara JG (2012) A systematic review of barriers to breast cancer care in developing countries resulting in delayed patient presentation. *J Oncol* 2012: 121873.
 40. Mbuka-Ongona D, Tumbo J M (2013) Knowledge about breast cancer and reasons for late presentation by cancer patients seen at Princess Marina Hospital, Gaborone, Botswana. *Afr J Health Care Fam Med* 5: 1-7.
 41. Otieno ES, Micheni JN, Kimende SK, Mutai KK (2010) Delayed presentation of breast cancer patients. *East Afr Med J* 87: 147-150.
 42. Pineros M, Sanchez R, Cendales R, Perry F, Ocampo R (2009) Patient delay among Colombian women with breast cancer. *Saludpublica Mexico* 51: 372-380.
 43. Ganiy O A Jnr and Ganiyu AR (2012) Epidemiology of Breast Cancer in Europe and Africa. *J Cancer Epidemiol* 51:1-5.
 44. Odusanya OO (2001) Breast cancer: knowledge, attitudes, and practices of female schoolteachers in Lagos, Nigeria. *Breast J* 7: 171-175.
 45. Schwartzmann G (2001) Breast cancer in South America: challenges to improve early detection and medical management of a public health problem. *J Clin Oncol* 19: 118S-124S.
 46. Justo N, Wilking N, Jönsson B, Luciani S, Cazap E (2013) A review of breast cancer care and outcomes in Latin America. *Oncologist* 18: 248-256.