IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 9 Ver. VI (September). 2016), PP 152-157
www.iosrjournals.org

Financial Burden of Managing Metastatic Breast Cancer in Sub-Saharan African.

Akanbi Olusola Olateju[1], Adeoti Moses Layiwola[1] *Aremu Ademola Adegoke[2], Habeeb Olufemi Gbenga[3], Ajiboye Anthony O[4], Oguntola Adetunji Saliu [1]

[1]*Surgery Department Ladoke Akintola University Of Technology Teaching Hospital Ogbomoso, Oyo State, Nigeria*
[2]*Radiology Department Ladoke Akintola University Of Technology Teaching Hospital Ogbomoso, Oyo State, Nigeria*
[3]*Surgery Department University Of Ilorin, Ilorin, Kwara State, Nigeria*
[4]*Bowen University Teaching Hospital Ogbomoso, Oyo State Nigeria*

Coreespopnding author:
Aremu Ademola A
lamode70@yahoo.com

Abstract: *The financial burden of managing breast cancer is enormous. This financial hardship becomes more worrisome when patients have to pay out of pockets, especially in low income countries where state supports is poor or absent. This study thus determined the extent and effect of the financial hardship in managing metastatic breast cancers in a low income country located in Sub-Saharan African. We prospectively enrolled all newly diagnosed patients with metastatic breast cancers who were gainfully employed or not but could estimate their monthly income. A total of 78 patients were enrolled over a year period. The total cost of managing metastatic breast cancer (MBC) ranged between 31,750 and 122,000 naira (113 and 436 USD) with mean of 58,092 ± 26,944 naira(207± 96 USD) over a month period, while the estimated patient' discretionary monthly income (PDMI) ranged between 2,500 and 41,500 naira (9 and 148 USD) with mean of 13,347 ± 12,425 naira (48 ±44 USD) over a month period which shows a statistical significant difference between the mean estimated PDMI and the mean estimated cost of managing metastatic breast cancer (MBC) over the same period ($p<0.001$) About 86% of our patients were in financial debts during study. The financial burden of managing metastatic breast cancer is enormous and we suggest the need for screening programmes that will encourage early diagnosis and introduction/extension of health insurance scheme to wider population.*

Keywords: *Financial burden, metastatic breast cancer, low income countries*

I. Introduction

Breast cancer remains the most common cancer and cause of cancer related death among women worldwide. [1] Breast cancer is a chronic disease with constant fear of recurrence and progression irrespective of treatment modalities, with significant medical and financial burden. The overall cost of managing the disease is often influenced by stage of the disease at presentation and is in positive correlation to severity of the disease vis a vis the stage at presentation. [2] The overall cost of managing the disease may be difficult to estimate in developing countries due to several logistic factors, such as poor record keeping, lost of patients to follow up and unstable economic status caused by unpredictable inflation pattern. The cost of managing a disease has been described from the perspective of the society, health care provider, or the payer (whom most often than not are patients themselves in Sub-Saharan African), their employer or health insurance organisation or their companies.[3] In developing nations patients were often responsible for their medical bill as health insurance scheme has low coverage and often not inclusive of significant percentage of non gornverment workers and non federal civil servants in our setting, thus making "out- of-pocket" payment responsible for significant percentage of medical bill/cost of treatment. The cost of managing a disease is a major factor that determines patients' compliance to prescribe treatment and choice of health care facility. [4] This is a cause for concern especially in low income countries with poor state support for treatment of cancers. A similar economic burden has been reported even in developed countries with better state support.[5, 6, 7] This study thus accessed the extent of economic / financial burden of managing metastatic breast cancer which is the a major mode of presentation in low income countries [8, 9, 10] over a period of 6 months or till end of life care whichever come first in patients with metastatic breast cancers presenting to our teaching hospital.

II. Methods

This prospective study was carried out in Ladoke Akintola University of Technology Teaching Hospital (LTH) Ogbomoso, over a 2 years period. Ladoke Akintola University of Technology Teaching Hospital is a new teaching hospital established about 5 years ago and located in South Western Nigeria region of Sub-Saharan African with facilities for primary, secondary and tertiary health care services. The hospital receives referrals from other primary, secondary health care centres and neighbouring tertiary teaching hospitals. The hospital is mainly funded by the owner state government with little contribution from the internally generated revenue from direct cash pay by patients for registration, clinic visit, drugs, investigations, admission fees, operative procedure and other services. The study prospectively recruited 78 newly diagnosed patients with metastatic breast cancer visiting our hospital for the first time and satisfied our inclusion criteria (Box 1) over a 2 years period.

Inclusion criteria

1. Newly diagnosed patients with metastatic breast cancer and above 18 year old
2. No previous treatment
3. Can estimate cost of income
4. Gives consent to participate

The following patients parameters were entered in to a preformed paper proforma at first visit; age, sex, occupation, monthly income for salary earners and estimated monthly income for non salary earners. This was obtained in naira and converted to United State Dollars equivalent to the nearest whole figure based on the exchange rate as at 09/10/2015 (280 naira to 1dollar) and this was used for the analysis, other information obtained include person who is responsible for treatment, duration of disease, reason for delay presentation, previous treatment, estimated cost of transport to the hospital per visit, total number of visitation to the hospital, total number of clinic visit, estimated total cost of investigations, drugs and procedures as requested by the health care workers, total cost of investigations and procedures patients were able to pay for, cost of hospital admission if any within the six months period.

The mean estimated cost for managing metastatic breast cancer for each patient over a month period was then compared to patients' mean disposable monthly income and mean discretionary monthly income (defined as the difference between patients' net monthly income and minimum obligatory monthly recurrence compelled expenditures such as payment for food, shelter, school fees etc). The continuous variable were analysed through the use of mean, and standard deviation while categorical variable were analysed using proportion. Test of significance was by chi square for univariate analysis and categorical variable with p value of less than 5% taken as significant,

III. Results

A total of 78 patients were recruited into the study, the patients' age ranged from 25 to 71year old with mean age of 46.25 (±13.48) years. The other sociodemographic characteristics of recruited patients are as shown in table 1.

Parameters	Number
M:F	1:77
Marital status	
Single	5
Married	37
Divorcee	14
Widow	22
Social class	
Low	19
Intermediate	57
High	2

Most (83.3%) of the patients were solely responsible for payment of their hospital bill as shown in figure 1 making out-of-pocket responsible for major means of payment,

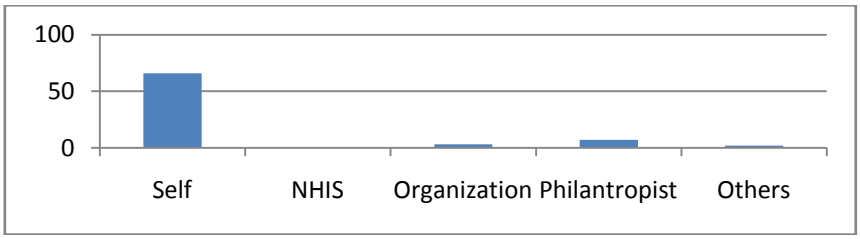

Figure 1: Shows sources of fund for payment of the hospital bill.
NHIS: National Health Insurance Scheme

The average disposable monthly income of our patients ranged from 26 to 571 USD (167 ± 85), while the estimated patients' discretionary monthly income for managing metastatic breast cancer in a month ranged from 9 and 148 USD (48 ±44) and the expected, calculated, estimated cost of managing metastatic breast cancer in a month for the patients ranged from 113 and 436 USD (207± 96) naira given a mean difference of 169 USD naira, which is statistically significant ($p<0.001$). Though no statistically significant difference between patients' disposable monthly income and estimated cost of managing metastatic breast cancer in a month however, there is a statistically significant difference between the patients' estimated discretionary monthly income of managing metastatic breast cancer over a month period and expected cost of managing advanced breast cancer over a month period ($p <0.001$). Figure 2 shows the detail of patients' mean disposable monthly income, discretionary monthly income and mean estimated cost of managing advanced breast cancer in one month among different social classes.

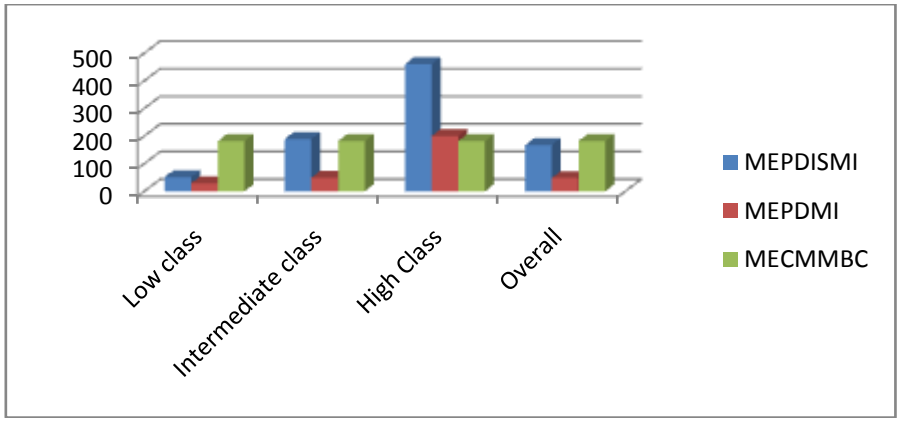

Figure 2: Shows the detail of mean estimated patients' disposable monthly income (MEPDISMI), mean estimated Patients' discretionary monthly income (MEPDMI) and mean estimated cost of managing metastatic breast cancer (MECMMBC) in a month among different social classes.

When the patients' financial input were considered over a 6 months period there is a statistical significant difference between patients' financial input and expected input in the first 2 months ($p <0.001$) which disappear by the end of the 4th month ($p = 0.056$) and re appear by the end of fifth month ($p = 0.0341$) (figure 3)

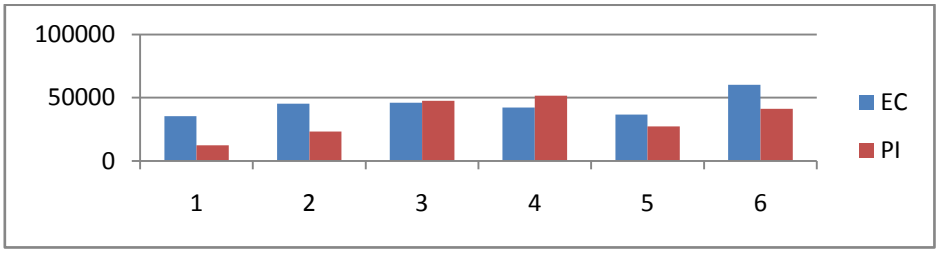

Figure 3: Shows mean patients' financial input (PI) and mean expected cost (EC) of management for each month over a 6 months period

By the end of the 6th month or end of life care 67 (85.9%) of our patients were in financial debt ranging from 86 to 333 USD (137 ± 83) figure 4.

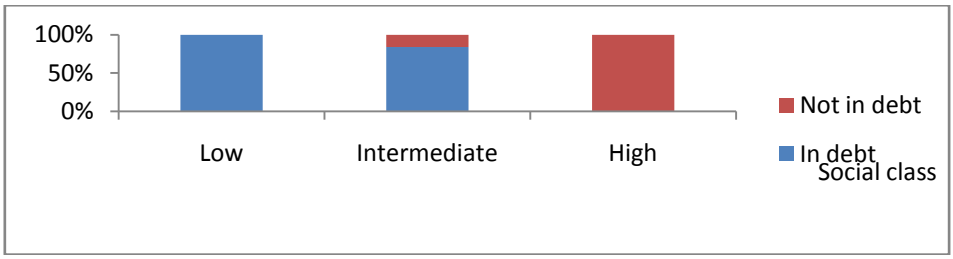

Figure 4: shows pattern of financial debts in percentages among different social classes after 6 months or at end of life care.

Analysis of patients 'outcome shows that most of the patients 58(74.25%) could not survive beyond 4th month following the diagnosis as shown in figure 5.

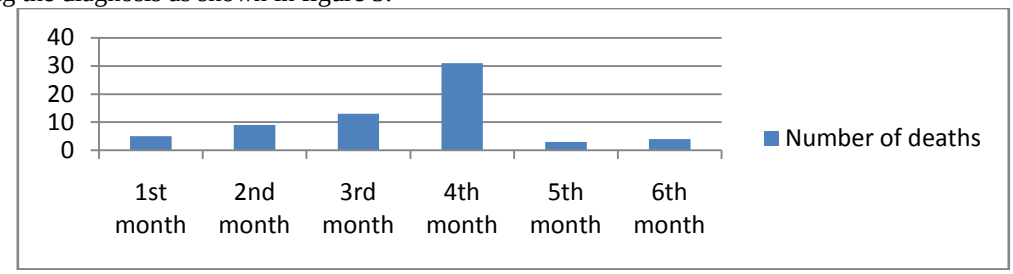

Figure 5: shows the number of deaths recorded at various months following diagnosis**.**

IV. Discussion

The cost of managing cancer is enormous though this is often suppressed by the initial emotional and psychological burden of the disease by the patients. [11] A similar occurrence noted in managing trauma, with a source of concern to physicians, patients and government. [10] The actual cost of managing a disease if often underestimated as the cost of man loss and cost of labour loss were often not inclusive and also bearing it in mind that cost of human life cannot really be calculated.

Managing breast cancer is costly, it taxes patients' psychosocial well being, emotion, time and patients' wallet. The cost of managing breast cancer varies from region to region and also varies based on the stage of the disease, biological nature of the tumour, available diagnostic/investigative process and treatment modalities that are available. The estimated cost of managing advanced metastatic breast cancer from diagnosis to death in USA is estimated to range from 41,590 to 82,973 USD **[**12, 13, 14] while the mean estimated cost of managing metastatic breast cancer with chemotherapy only in a previous study was 128,558 USD over 18 months period. [15] This is comparatively far higher than our own overall estimated cost, the possible explanation for this disparity is due to relatively lack of more expensive investigative facilities, chemotherapeutic drugs and other adjuvant drugs in managing advanced disease in our setting as only one of our patients was able to pay for a single course of Herceptin while three patients were able to afford aromatase inhibitor for more than two months while in the study and none of the patients was able to receive radiotherapy**.** Despite this lower figure in our study most of the patients still experienced significant financial hardship. This financial implication is so enormous on patients that sometimes some patients often result to loans from banks to cater for their treatment (ending up in debt) while some even defaulted from hospital setting to alternative medicine or complete withdrawal from all treatments with agonising death from advanced disease.

Our study has showed that a mean estimated sum of 182 USD is required to manage metastatic breast cancer over a month period while the mean disposable monthly income of the patients is 167 USD with mean monthly estimated discretionary income of about 48USD naira. The financial burden of managing breast cancer in low income countries with low GPD has previously been reported [16] and well recognised even in more affluent, developed countries.[5, 6] In our previous study on delay presentation of breast cancer financial incapability was ranked second following fear of mastectomy as major indication for delay presentation. [8] The immediate and ongoing financial drain on patients with breast cancers serves as a secondary source of depression apart from the nature of the disease.

Another finding of our study is that about 85% of our patients paid out-of-pocket for their medical bill with little or no impact from other sources such as NHIS, organisation (figure1) this is similar to the Pakistan study[16] but at variance to what is obtainable from developed countries such as in Canada and USA whereby government offer significant financial support. Even in these developed countries, families of breast cancer patients still experienced some level of financial burden [5,6] from unforeseen and unplanned expenses in the course of their treatment, it's therefore unimaginenable the extent of economic suffocation breast cancer patients experience in developing countries.

This financial implication is so enormous on patients that sometimes some patients often result to loans from banks and several alternatives sources to cater for their treatment and ending up in serious financial debt, as seen in this study with 86% of the patients in significant financial debt. Some patients defaulted from hospital setting to alternative medicine or others stopped treatment completely and die in agony of late disease due to lack of financial hardship.[16]

Another finding from the study is the pattern of financial input from the patients (figure 4) most of the patients failed to meet their financial need in the early period until about 3rd and 4th months' and subsequently failed to meet such financial demand when the patients is finally reaching stage of end of life care. This bimodal pattern of financial failure to meet the financial demand can be due to the fact that early period coincided with period of raising funds, from money lender and banks which later materialised at the middle phase, while the later phase coincided with the period patients' condition is probably deteriorating rapidly and the care givers are losing hope of a succesful outcome, which often may not be unconnected with the counselling from other health care workers briefing the patients' relatives and other care givers about the possibility of wasting funds on a terminally ill patients. This form of unethical counselling should be discouraged from those who have little knowledge about the principle of end of life care, as patients care givers will not only withdraw funds from their so called unnecessary traditional investigations of teaching hospitals and procedures but also from drugs/medication required for management of end of life care such as drugs/medication for pain control etc leaving patients in unacceptable agony, contradicting one of the principle of end of life care.

Only about 17% of our patients were able to survive beyond sixth month following diagnosis. This is comparably lower to what is obtainable in developed countries where majority of patients with metastatic breast cancer survive beyond 12-18 months following diagnosis with 1 survival of 67% [17] and 5 years survival of 15-26% in north United state of American and united kingdom.[18,19] Though the possibility of less aggressive tumour in Caucasian may contribute to these higher figures obtained from developed countries, however other contributing factors include: availability of funds to manage possible complications of the metastatic disease and use of recent, more effective chemotherapeutic agents with less side effect (such as capecitabine) and biological agent (such as Herceptin) that are relatively out of reach of most the patients with metastatic disease in low income countries. A non documented retrospective review of our patients with breast cancer in preceding two years prior to this study revealed that only two of our patients who were able to procure both capecitabine and Herceptin® for 4 and 6 cycle had a survival of 13 and 22 months respectively from diagnosis, a figures fairly comparable to that of developed countries.

Advanced breast cancer is associated with high economic toll demand from patients. This is probably due to increase number of investigations, procedures, number of clinic visits and hospital admission coupled with enormous amount of money to manage associated complications and demand of end of life care needed to manage such patients with advanced disease.

Early diagnosis and presentation through screening programme will help to reduce the financial burden of managing advanced cancer. Introduction and involvement of general populace into the national health insurance scheme (NHIS) programme will further ease patients' financial burden when confronted with advance breast cancer, as advanced breast cancer may be inevitable as a progression of the disease in some selected patients who may earlier presented with early disease.[18] Though in developing countries such as Nigeria, most government hospital are subsidised, where government actively involved in funding of the hospitals the authors still believe that government and other non-governmental organisation still need to do more in alleviating financial burden of our common cancer patients through provision of free screening facilities, diagnostic and other procedures at a further reduced rate or even free, a phenomenon that can be burrowed from governmental and some non-governmental organisation policies for managing patients with tuberculosis and retrovirus disease, who presently enjoy free health services.

V. Conclusion

This study further confirmed the high magnitude of financial burden patients with breast cancer experienced and most patients pay from out-of-pocket. This burden on patients can be lessened through further campaign on benefit of early diagnosis and treatment and via introduction of wide spread health insurance scheme.

References

[1]. Beaston JR and Jatol I . global breast cancer burden. Future oncol 2011 8(6) 697-702.
[2]. Comparison of treatment cost for Breast cancer, by Tumour Stage and Type of Service. American Health and Drug Benefits. Vol 9 No 1february 2016
[3]. TK Yau, CW Choi, Esther NG, Rebecca Yeung, Inda S Soong and Anne WM lee 2013. Delayed presentation of symptomatic breast cancers in Hong Kong: experience in a public cancer centre. Hong Kong Med J., 16(5):373-377.
[4]. Eisenberg JM. Clinical economics: a guide to the economic analysis of clinical practices. JAMA 1989;262:2879-886
[5]. Richard J Sperry. Principle of economic analysis. Anaesthesiology. 1997;86:1197-1205.

[6]. Arozullah AM, Calhoun EA, Wolf M, Finley DK, Fitzner KA, Heckinger EA. Et al. The financial burden of cancer: estimate from a study of insured women with breast cancer. J Support Oncol. 2004;2(3):271-278.
[7]. Gordon L, Scufftham p, Hayes S, Newman B. Exploring the economic impact of breast cancers during the 18 months following diagnosis. Psychooncolog.2007;16(12):1130-1139. doi:10.1002/pon.1182.
[8]. Longo CJ, Fitch M, Deber RB, Williams AP.financial and family burden with cancer in Ontario, Canada. Support care cancer.2006;14(110:1077-1085. doi 10.1007/s00520-006-0088-8.
[9]. Akanbi OO , Oguntola, AS, Adeoti ML et al. 2015. Delay presentation of breast cancer: a study among south western Nigerian women. International Journal of Current Research. 7(8): 19035-19039.
[10]. El Saghir NS, Adebamowo CA, Anderson BO, et al: Breast cancer management in low resource countries (LRC): consensus statement fromthe breast health global initiative . Breast 2011.20(suppl2):S3-S11.
[11]. Adebamowo CA, Ajayi OO: Breast cancer in Nigeria. *West Afr J Med* 2000,19:179-191
[12]. Legorreta AP, Beooks RJ, Leibowitz AN, Solin LJ: Cost of breast cancer treatment : A 4-year longitudinal study.Arch Inten Med 1996,156:21972201.
[13]. Berkowitz N, Gupta S, Silberman G: Estimates of the life time direct costs of treatment for metastatic breast cancer. Value Health 2000,3:23-30.
[14]. Taplin SH, Barlow W, Urban N, Maldelson MT, Timlin DJ,Ichikawa L, Nefcy P. stage, age, comorbidity and direct cost of colon, prostate and breast cancer care.J Natl Cancer Inst 1995, 87:417-426.
[15]. Montserrat Vera-Llonch, Derek Weycker, Andrew Glass et al. Health care costs in women with metastatic breast cancer receiving chemotherapy as their principal treatment modality. BMC Cancer 2011, 11:250
[16]. AdnanAZ, Tayyaba ZA and Aziz K. The financial burden of cancer estimates from patients undergoing cancer care in a tertiary care hospital. Int J Equity Heath. 2012:11:60
[17]. National cancer intelligence Network. Cancer survival in England by stage 2012. London :NCIN; 2014.
[18]. American cancer society's publication, cancer fact and figures 2016, and the National Cancer Institute Surveilliance Epidemiology and End results (SEER) database.
[19]. Cancer research UK. Breast cancer research statistics. Gotten from http://www.cancerresearchuk.org, accessed on 28th August 2016.