Special Issue: Development and Sustainability in Africa – Part 2

Breast cancer incidence in Sokoto, Nigeria

S.P. Agbo [1]*, M. Oboirien [1], G. Gana [2]

[1] Department of Surgery, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria
[2] Department of Community Health, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

Abstract

Breast cancer cases presenting to the Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria has been on the rise in recent times. This brings into focus the burden of the disease and its management challenges in a developing country like Nigeria. The objective is to determine the annual incidence and management outcome of breast cancer in Sokoto, Nigeria. A prospective cohort study where all patients that presented to the surgical outpatient department of the hospital between 1st January 2011 and 31st December 2011 with histologically confirmed neoplastic breast disease were administered questionnaire and followed up subsequently. Socio-demographic characteristics, diagnosis and management outcome of patients were studied. A total of 430 patients were seen out of which 224(52.1%) had benign breast disease and 206(47.9%) had breast cancer. 217(50.5%) patients had fibroadenoma, 201(46.7%) had invasive ductal carcinoma, 5(1.2%) had fibrocystic disease, while 3 (0.7%) patients had invasive lobular carcinoma. The annual incidence of breast cancer was 7.4 per 100 000 women. The peak age range was 41-50 years. The M:F ratio for breast cancer was 1:103. 108 (52.4%) patients presented with Manchester stage 3 disease, 96 (46.6%) patients with stage 4 and 2 (1%) patients with stage 2 disease. 150 patients (72.8%) had Auchincloss' modified radical mastectomy while 38 patients (18.4%) had toilet mastectomy. Overall mortality was 9.3%(19). 101(53.7%) patients were seen during follow up visit by end of study year. In conclusion, breast cancer in Sokoto, Nigeria continues to carry poor prognosis with only 1% (2) presenting with early disease.

Keywords: Breast Cancer, Cancer Incidence, Women, Nigeria

* Corresponding author. *E-mail address:* agbostephen@yahoo.com

1. Introduction

Breast cancer is the commonest malignancy occurring in women worldwide with up to one million cases seen annually (Forbes, 1997; Parkin et al., 1999). The incidence varies widely with rates highest in North America and Western Europe and low in Japan, China and black Africa (Parkin et al., 1999; Kalache, 1990). Breast cancer is the most common cancer occurring among women in Nigeria having overtaken cancer of the cervix (Solanke and Adebamowo, 1996). It is also the commonest cancer among women in South Africa (Hoffman et al., 2000). While incidence seems to have stabilized and even declined in most developed countries, it has been increasing in hitherto low incidence areas of Asia and black Africa (seo et al., 1996; Wakai et al., 1995; Taiwo and Eral, 1998). The incidence rate of breast cancer among West African women is quite low compared to that of African-Americans and Whites but it has gradually risen in recent times such that the incidence in premenopausal age group is now higher than those of whites (Taiwo and Eral, 1998). Earlier incidence rates were between 13.8 and 15.3 per 100,000, but it has now risen to 33.6 per 100,000 (Taiwo and Eral, 1998). The reason for this rise may be due to "westernization" of dietary lifestyle, increase in the average life expectancy, use of hormone replacement therapy (HRT) in the urban areas, and better reporting of the disease (Yip and Taib, 2012). The decrease in incidence rates of breast cancer in the USA and Great Britain among women aged between 50 and 64 years on the other hand are linked to decrease use of HRT (Ravdin et al., 2007; Brewster et al., 2009).

2. Method

This was a prospective cohort study in which all patients that presented to the surgical outpatient department (SOPD) of the Usmanu Danfodiyo University Teaching Hospital, Sokoto, between 1st January 2011 and 31st December 2011, with histologically confirmed breast tumour were administered questionnaire and followed up subsequently in the SOPD and in the ward by residents. Parameters studied included socio-demographic characteristics, diagnosis and management outcome of all patients. Results were analyzed using windows SPSS statistics 17.0.

2.1. Exclusion criteria

Patients with breast lesions not confirmed histologically and those with histologically confirmed non-neoplastic lesions were excluded from the study.

3. Results

A total of 430 patients were seen, out of which 224(52.1%) had benign breast disease and 206(47.9%) had malignant breast disease. Table 1 shows overall percentage distribution of breast diseases seen in 2011. 217(50.5%) patients had fibroadenoma, 201(46.7%) had invasive ductal carcinoma, 5(1.2%) had fibrocystic disease while 3(0.7%) patients had invasive lobular carcinoma. Duct papilloma, malignant phyllodes tumour

and fibrosarcoma all had 1(0.2%) case each. The peak age range for fibroadenoma was 11-20 years, while that for fibrocystic disease was 31- 40 years (Table 2). Table 3 and Figure 1 shows the distribution of malignant breast diseases in 2011. Invasive ductal carcinoma was the most commonly diagnosed malignant breast disease with 201(97.6%) patients. Invasive lobular carcinoma followed with 3(1.5%) patients while malignant phyllodes tumour and fibrosarcoma had 1(0.5%) patient each. The peak age range for breast cancer was 41-50 years. There were 2 males with invasive ductal carcinoma giving a M:F ratio of 1:103. Table 4 and Figure 2 shows the age distribution of invasive ductal carcinoma which is the commonest histologic type in this study. The denominator for calculating annual incidence was based on the 2006 population census where women population figure for Sokoto and Kebbi states was 2,781,416. The Usmanu Danfodiyo university teaching hospital serves these two states predominantly, and Kebbi state had no resident general surgeon at the time of this study. The annual incidence for breast cancer was 7.4 per 100,000 women. A total of 108(52.4%) patients presented with Manchester stage 3 disease, while 96(46.6%) patients presented with stage 4. 2 (1%) patients presented with stage 2 disease. No stage 1 disease was seen. Table 5 and Figure 3 shows the Manchester staging presentation of breast cancer in 2011. 150(72.8%) patients had Auchincloss' modified radical mastectomy while 38(18.4%) patients were offered toilet mastectomy. 1(0.5%) patient died post operatively while 18(8.7%) patients died before surgery, bringing overall mortality to 19(9.3%) patients. Table 6 and Figure 4 shows mortality pattern for breast cancer in 2011. 180(95.7%) patients were seen at 6 months of follow up while 101(53.7%) patients were seen at the end of the year of study. 87(46.3%) patients treated were therefore lost to follow up. Table 7 shows the follow up pattern of patients in 2011.

4. Discussion

The study showed that breast cancer constitutes 47.9% (206) of all breast diseases seen in 2011, while benign breast disease was 52.1% (224). The benign: malignant (B:M) ratio was 1.1:1. This is in sharp contrast to most studies within and outside Nigeria. Ochicha et al in Kano, Nigeria noted that benign breast disease accounted for 71.9% of breast diseases in women with a B:M ratio of 2.6:1 (Ochicha et al., 2002). Fibrocystic disease was the commonest histological type seen 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 (Ochicha et al., 2002). Otu in Calabar, Nigeria got 73.4% benign cases, with B:M ratio of 2.8:1, Oluwole et al in Ife got 79% benign diseases, with B:M of 3.8:1, Okobia and Osime in Benin city got 90% benign cases with B:M ratio of 9:1 (Out, 1990; Oluwole et al., 1987; Okobia and Osime, 1998). Fibroadenoma was the most common benign breast disease in their series (Oluwole et al., 1987; Okobia and Osime, 1998). Fibroadenoma was the commonest benign breast disease in our study accounting for 50.5% (217) and with a peak age range of 11-20 years. The annual incidence of breast cancer in our study was 7.4 per 100 000. Invasive ductal carcinoma was the predominant histological type at 97.6% (201). Ihekwaba in Ibadan, Nigeria got an annual rate frequency of 33.6 per 100 000 women, with infiltrating ductal cancer the dominant histological type at 49.2% (Ihekwaba, 1992). The peak age range in his study was 36-45 years and 73.8% presented with stage 3 disease while 17.2% presented with stages 1 and 2 cancer (Ihekwaba, 1992). The age at presentation is

slightly higher in our study at 41-50 years. Of note is the sharp difference in stage at presentation with only 1% presenting with early disease in our study compared to 17.2% in Ibadan and 57.8% in Western Cape (Ihekwaba, 1992; Hoffman et al., 2000). The apparent low incidence in our study may be due to the cultural practice in this part of the country where most women seek alternative treatment (ranging from herbal to religious help) rather than coming to "die" in the hospital. They believe that patients that come to hospital with breast cancer "always ended up dying". This partially explains why most women present with advanced disease as our figure has shown thereby leaving them with only the palliative option of treatment. Aggressive awareness campaign is the only way to change this attitude (Odusanya, 2011). Surgery is the most common palliative treatment offered here. This is often followed by adjuvant chemo-radiotherapy but compliance is very poor due to financial difficulties. Hoffman et al in western cape, South Africa got an overall incidence of 23.1 per 100 000 women per year (Hoffman, 2000). The incidence rate for colored women in their study was 25.6 per 100 000, while that for black women was 14.7 per 100 000. The incidence in urban areas was 26.6 per 100 000 while that for rural areas was 16.3 per 100 000. 42.2% presented with advanced disease (stages 3 and 4) while 57.8% presented with early disease (stages 1 and 2). They noted that advanced disease was more among the rural uneducated women than the urban women, thereby emphasizing the importance of education and access to diagnostic measures in early detection of breast cancer (Hoffman, 2000). Majority of the women in our study were uneducated rural house wives. Vorobiof et al. (2001) got an incidence of 20: 100 000 in Zimbabwe, 4: 100 000 in Gambia and 70: 100 000 (among whites) and 11: 100 000(among blacks) in South Africa (Vorobiof et al., 2001). Incidence of breast cancer in Uganda doubled from 11: 100 000 in 1961 to 22: 100 000 in 1995 (Wabinga, 2000). The incidence in developed countries like the United States and the United Kingdom, is much higher, ranging between 50 and 100 per 100 000 and was responsible for about 375 000 deaths in the United States in 2000 (Althuis et al., 2006; Bray et al., 2004). Globally, 1.4 million women were diagnosed with breast cancer in 2008 with approximately 459 000 deaths (Youlden et al., 2012). Incidence rate for developed countries was 71.7 per 100 000 and developing countries was 29.3 per 100 000 (Youlden et al., 2012). The five year survival estimates for parts of Africa was 12% compared to 90% in the United States, Australia and Canada where cancers are detected early and patients have ready access to treatment (Youlden et al., 2012). The overall mortality in our study was 19(9.3%). And most of the 87(46.3%) patients lost to follow up in the first year are presumed dead or too discouraged to continue treatment in hospital due to mounting expenses. The future worldwide breast cancer burden will be strongly influenced by large predicted rises in incidence through parts of Asia and Africa due to westernized lifestyle (Youlden et al., 2012). And unless urgent measures are put in place for early detection and easy accessibility to treatment, the prognosis for breast cancer will continue to be poor in this part of the country where no form of health insurance is available for the majority of patients.

5. Conclusion

The incidence of breast cancer for Sokoto in 2011 was 7.4 per 100 000 women with 99% presenting with advanced disease (stages 3 and 4) and 0.5% with stage 2 disease. Nearly half the patients treated (46.3%)

were lost in the first year of follow up. Breast cancer continues to carry poor prognosis in this part of the country.

References

Forbes, J.F. (1997), The incidence of cancer: the global burden, public health consideration, Semin Oncol., Vol. 24 No 1, pp. 20-35.

Parkin, D.M., Pisani, P., Ferlay, J. (1999), Global cancer statistics, CA Cancer J Clin., Vol. 49 No. 1, PP. 33-64.

Kalache, A. (1990), Risk factors for breast cancer, with special reference to developing countries, Health policy and planning, Vol. 5, pp. 1-22.

Solanke, T.F., Adebamowo, C.A. (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, D.M., Gudgeon, A., et al. (2000), Breast cancer incidence and determinants of cancer stage in the Western Cape, S Afr. Med J, Vol. 90 No. 12, pp. 1212-1216.

Seo, W.A., Duffy, S.W., McGee, M.A., Lee, J., Lee, H.P. (1996), Breast cancer in Singapore: Trends in incidence 1968-1992, Int J Epidemiol., Vol. 25 No. 1, pp. 40-45.

Wakai, S., Suzuki, S., Ohno, Y., Kawamura, T., Tamkoshi, A., Aoki, R. (1995), Epidemiology of breast cancer in Japan, Int Epidemiol., 1995; Vol. 24 No. 2, pp. 285-291.

Taiwo, G.I., Earl, B.S. (1998), Pattern of breast cancer among White-American, African-American and non-immigrant West African women, J Nao Med Assoc, Vol. 90, pp. 547-551.

Yip, C.H., Taib, N.A. (2012), Challenges in the management of breast cancer in low- and middle-income countries, Future Oncol., Vol. 8 No. 12, pp. 1575-83.

Ravdin, P.M., Cronin, K.A., Howlader, N., et al. (2007), The decrease in breast cancer incidence in 2003 in the United States, N Engl J Med, Vol. 356, pp. 1670-4.

Brewster, D.H., Sharpe, K.H., Clark, D.I., Collins, J. (2009), Declining breast cancer incidence and decreased HRT use. Lancet, Vol. 373, pp. 459-60.

Ochicha, O., Edino, S.T., Mohammed, A.Z., Amin, S. N. (2002), Benign breast lesions in Kano, Nig J Surg Research, Vol. 41 No. 2, pp. 1-5.

Out, A.A. (1990), Benign breast tumours in an African population, J R Coll Surg. Edin, Vol. 35, pp. 337-375.

Oluwole, S.F., Fadiran, O.A., Odesanmi, W.O. (1987), Diseases of the breast in Nigeria, Br J Surg, Vol. 74, pp. 582-585.

Okobia, M.N., Osime, U.A. (1998), A clinicopathological study of benign breast diseases in Benin City, Nigeria, Nig J Surg, Vol. 5, pp. 64-68.

Ihekwaba, F.N. (1992), Breast cancer in Nigerian women, Br J Surg, Vol. 79 No. 8, pp. 771-5.

Odusanya, O.O. (2011), Breast cancer: knowledge, attitude and practices of female school teachers in Lagos, Nigeria, Breast Journal, Vol. 7 No. 3, pp. 171-175.

Vorobiof, D.A., Sitas, F., Vorobiof, G. (2001), Breast cancer incidence in South Africa, J Clin Oncol., Vol. 19 No. 18S, pp. 125s–127s.

Wabinga, H.R., Parkin, D.M., Wabwire-Mangeni, F., Nambooze, S. (2000), Trends in cancer incidence in Kyadondo County, Uganda, 1960–1997, Br J Cancer, Vol. 82, pp. 1585–1592.

Althuis, M.D., Dozier, J.M., Anderson, W.F., Devesa, S.S., Brinton, L.A. (2005), Global trends in breast cancer incidence and mortality 1973–1997, Int J Epidemiol., Vol. 34 No. 2, pp. 405–412.

Bray, F., McCarron, P., Parkin, M.D. (2004), The changing global patterns of female breast cancer incidence and mortality, Breast Cancer Res., Vol. 6, pp. 229–239.

Youlden, D.R., Cramb, S.M., Dunn, N.A., Muller, J.M., Pyke, C.M., Baade, P.D. (2012), The descriptive epidemiology of female breast cancer: an international comparison of screening, incidence, survival and mortality, Cancer Epidemiol., Vol. 36 No. 3, pp. 237-48.

Tables and Figures

Table 1. Overall percentage distribution of breast diseases seen in the year 2011

Disease	Frequency (%)
Fibroadenoma	217 (50.5)
Invasive ductal carcinoma	201 (46.7)
Fibrocystic disease	5 (1.2)
Invasive lobular carcinoma	3 (0.7)
Ductal papilloma	1 (0.2)
Lipoma	1 (0.2)
Malignant Phylloides tumour	1 (0.2)
Fibrosarcoma	1 (0.2)
Total	**430 (100)**

Table 2. Age distribution of benign breast diseases in 2011

Disease	Age group (years)				
	11 - 20	**21 – 30**	**31 – 40**	**41 – 50**	**Total**
Fibroadenoma	123	80	10	4	217
Fibrocystic disease	2	1	2	-	5
Duct papilloma	-	1	-	-	1
Lipoma	-	1	-	-	1
Total	**125**	**83**	**12**	**4**	**224**

Table 3. Age distribution of malignant breast diseases seen in 2011.

Malignant breast diseases		Age group						
s/no	Breast disease	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years	Total (%)
1	Invasive ductal cancer	2	28	109	41	17	4	201(97.6)
2	Invasive lobular cancer	0	0	3	0	0	0	3 (1.5)
3	Fibrosarcoma	0	0	1	0	0	0	1 (0.5)
4	Malignant phylloides tumour	0	0	1	0	0	0	1 (0.5)
	Total	2	28	114	41	17	4	206

Table 4. Age distribution of Invasive ductal cancer the commonest occurring cancer in 2011

S/no	Age group	Frequency (%)
1	11 – 20 years	0 (0)
2	21 – 30 years	2 (1)
3	31 – 40 years	28 (13.9)
4	41 – 50 years	109 (54.2)
5	51 – 60 years	41 (20.4)
6	61 – 70 years	17 (8.5)
7	71 – 80 years	4 (2)
Total		**201 (100)**

The mean and modal age group is 41 – 50 year age group.

The mean age is 48.2 years.

Table 5. Shows the Manchester staging at presentation of breast cancer cases seen in 2011

Manchester staging	Frequency	%
I	0	0
II	2	1
III	108	52.4
IV	96	46.6
Total	**206**	**100**

Table 6. Showing Mortality pattern of Breast cancer patients seen in 2011

S/no	Stage of Mortality	Frequency (%)
1	Pre-operative	18 (8.7)
2	Post-operative	1 (0.5)
Total		**19 (9.3)**

Table 7. Follow up data of Breast cancer patients seen in 2011

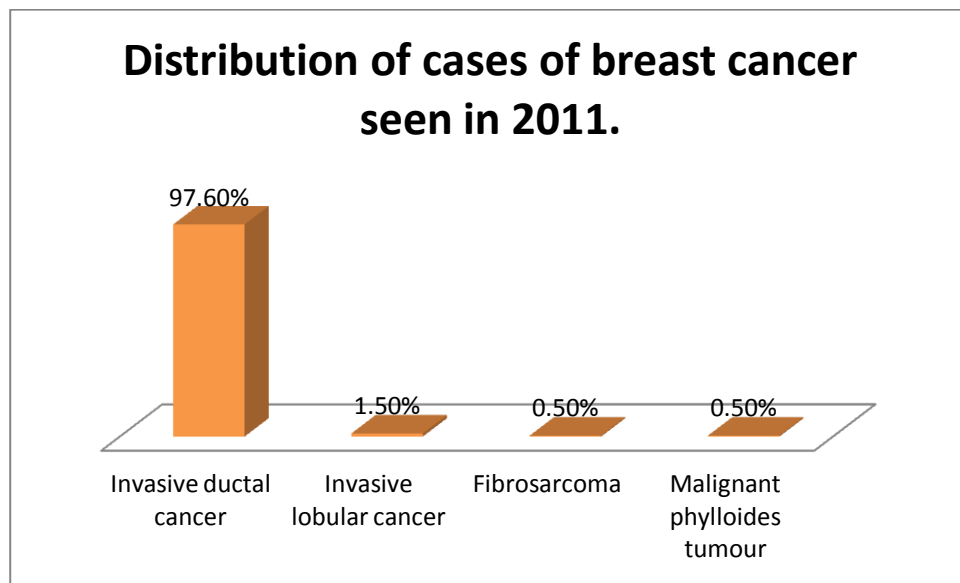| S/no	Follow up period	Frequency (%)
1	6 months post-operative	180 (95.7)
2	12 months post-operative	101 (53.7)

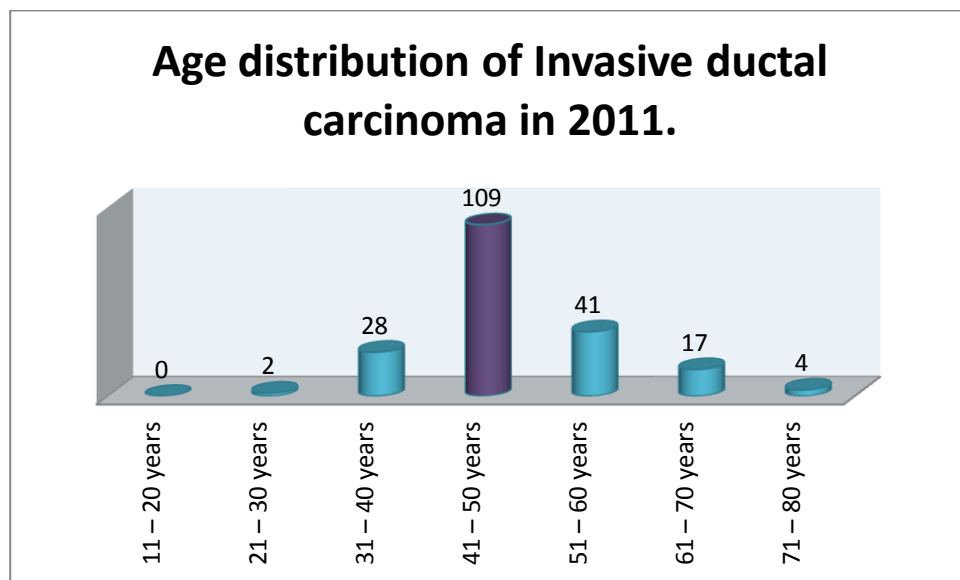**Figure 1.** Bar chart showing the distribution of breast cancer cases seen in 2011

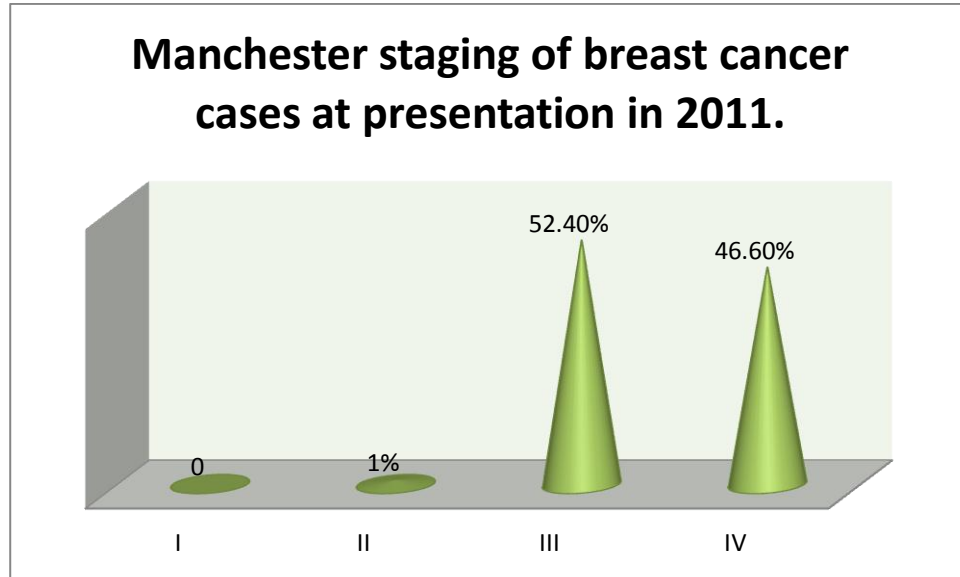**Figure 2.** Age distribution of Invasive ductal carcinoma in 2011

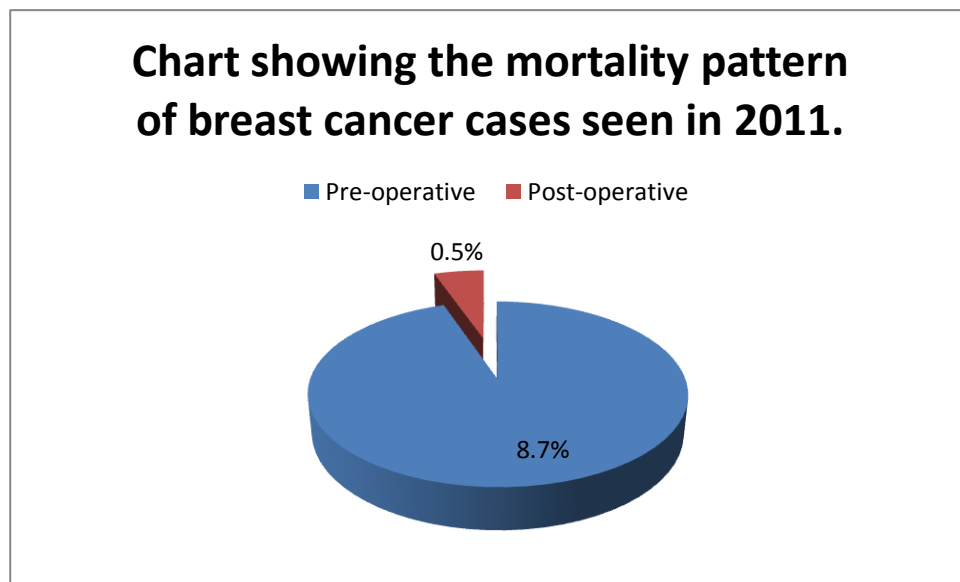**Figure 3.** Manchester staging of breast cancer cases seen in 2011

Figure 4. Shows the mortality pattern of breast cancer patients seen in 2011