RESEARCH ARTICLE

Trends of Breast Cancer and its Management in the Last Twenty Years in Aden and Adjacent Governorates, Yemen

Nasser AA Harhra[1]*, Huda O Basaleem[2]

Abstract

  Background: Breast cancer is the most common cancer of women and the principal cause of death in middle aged women. The objective of this study was to describe the trend of breast cancer and its management in Aden and adjacent south-eastern governorates of Yemen during the last 20 years. **Patients and Methods**: This is a retrospective analysis of previous studies on patients with breast cancer in Aden and adjacent south-eastern governorates, Yemen (January 1989 through December 2007). The studied variables were: sex, age, time and type of presentation, disease stage, pathological types and the performed surgical treatment. The sources of information were the treatment registry of Aden health office, archives of Al-Gamhouria teaching hospital; major referral and other public and private hospitals in Aden and Aden Cancer Registry. **Results**: The total number of patients was 476, 99% being females. The age range was 19-88 years. The most affected age was 30-50 years (60.5%), 95% presenting after one month of having breast symptoms. Forty-five percent presented with signs of advanced local disease, while 59.2% had palpable axillary lymph nodes on presentation. Early breast cancer (stages I-II) occurred in 47%, and late breast cancer (stages III-IV) in 51.5%. Invasive ductal carcinoma was the commonest pathology (89.3%). The main surgical treatment was mastectomy (modified radical mastectomy (50%). **Conclusion**: Breast cancer is predominantly a disease of young with late presentation and advanced disease. Improving health awareness and earlier diagnosis of the disease by health education, encouraging breast self-examination, and providing the mammography equipment and mammary clinics in hospitals are recommended. Establishment of oncology and radiotherapy centers in Aden is a necessity.

Keywords: Breast cancer - advanced breast disease - clinical patterns - mastectomy - Yemen

Introduction

  In both developing and developed countries, breast cancer is still the most common cancer of women and the principal cause of death in middle aged women (Bray et al., 2004; Hortobagyi et al., 2005; Jemal et al., 2010). With the lifetime risk of developing breast cancer as high as one in eight women in some Western countries (Ries et al., 2004) and a 5-year prevalence of approximately 4.4 million cases worldwide (Bray et al., 2004) the global burden of breast cancer is substantial (Ferlay et al., 2004).

  Epidemiologists have documented many risk factors for the development of breast cancer. Early age at menarche, nulliparity, late age at first birth, low parity and late menopause were related to the increase of breast cancer risk (Bernier et al., 2000; Aghassi et al., 2002; Bernstein, 2002). Breast feeding of longer duration too has been affirmed protective (Bernier et al, 2000; Beral, 2003). The association between women in higher socio-economic groupings and risk of breast cancer is well established (O'Malley, 2003; Lagerlund et al., 2005). Exposure to exogenous hormones as oral contraceptives, hormone replacement therapy (Beral, 2003) and dietary

fat intake (Velie et al., 2005) result in an increase in the risk of breast cancer. Despite recognition of all these risk factors, about 70 % of females who develop breast cancer do not have identifiable risk factors (Parkin et al., 2005). However, the most significant risk factors for breast cancer are gender (being a woman) and age (growing older). (US Breast Cancer statistics, 2012).

  The incidence in high-risk areas; such as North America, Western Europe and Australia varies from 30-90 per 100000 populations per year but studies have reported lower incidence in women in developing countries of Asia and Africa (Hadi et al., 2002; Walker et al., 2004; Boyle and Ferlay, 2005; Hortobagyi et al., 2005; Smigal et al., 2006; US Breast Cancer Statistics, 2012). Screening programs in the developed countries, increases the breast cancer detection and it is participated in decreased mortality rate of breast cancer. This improvement is related to the marked development in breast screening techniques, health awareness and earlier diagnosis of the disease .Such programs mostly include screening mammography and breast self-examination (Olsson et al., 2000; Breen et al., 2001; Swan et al., 2003; Shen et al., 2005). The treatment of breast cancer has evolved

*[1]Department of Surgery, [2]Department of Community Medicine and Aden Cancer Center Faculty of Medicine, University of Aden, Yemen *For correspondence: dr_harhra@yahoo.com*

dramatically, it is now established that care of breast cancer patients is a multidisciplinary team approach. In addition to the surgeon, oncologist and radiotherapist, it is often useful to employ the skills of a trained breast counselor, breast prostheses, psychological support and physiotherapy care (Jardines et al., 2003; Saunders, 2008). Over the last 25 years, breast conservation therapy (BCT) has become the treatment standard for most breast tumors which have been early detected. This technique includes segmental mastectomy, clearance of axillary lymph nodes and radiotherapy (Fisher et al., 2001; Chen et al., 2004; Kawase et al., 2005). Large prospective trials have demonstrated that survival rates, after BCT, are equivalent to those obtained after radical mastectomy (Veronesi et al., 1990; Buchholz et al., 2001; Fisher et al., 2002). Radiotherapy, chemotherapy and hormonal therapy are effectively used as adjuvant therapy in early breast cancer, neo-adjuvant therapy in locally advanced cancer or as palliative treatment for metastatic breast cancer (Kaufmann et al., 2003; Sledge et al., 2003; Clarke et al., 2005; Sainsbury, 2008).

In Sana'a – Yemen, study of the pattern of malignancies among 1,491 patients found that, breast cancer ranked first among Yemeni women and formed 8% of all cancers (Althobhani et al., 2001). On the other side, remote epidemiological studies about breast cancer in south eastern areas of Yemen, reported breast cancer as the most leading site of cancer among women in Aden-city (Bawazir and Abdulhamid, 2002) and as the most common malignancy in women in south eastern areas of Yemen (Bawazir et al., 1998). Between January 2002 and December 2006, the population-based Aden Cancer Registry reported 334 cases of female breast cancer . This cancer was the first ranked cancer among overall cancer sites (16.6%) and female cancers (30.3%) (BaSaleem et al., 2010).

The objective of this study is to describe the trend of breast cancer and its management in Aden and adjacent southeastern governorates of Yemen through reviewing and analyzing the last local published studies about breast cancer during the last 20 years.

Materials and Methods

This is a retrospective analysis of previous studies on patients with breast cancer in Aden and adjacent southeastern governorates of Yemen. They were done in the last 20 years (January1989 to December 2007).The studied variables were: sex, age, time and type of clinical presentation, stage of disease, pathological types and the performed surgical treatment. Studies were accessed through internet search and searching for available reports. The included studies (Table 1) were:

Study I (Abdulhameedet al., 2004): a retrospective study used the treatment registry of Aden health office and archive of Al-Gamhouria teaching hospital, the major referral hospital in Aden which receives patients from Aden and other adjacent governorates , from January 1989 through December 1996 and the records of patients registered at Aden Cancer Centre from January 1997 to December 1998. It included 227 patients with breast cancer registered between January1989 through December 1998.

Study II (Harhra, 2005): an observational retrospective study, using the registry of Algamhouria teaching hospital. All patients with histopathology of breast cancer were included, during the period from December 1998 through to December 2002. It included 74 patients with the diagnosis of breast cancer .

Study III (Satae, 2005): a Thesis for Master degree in surgery – Faculty of Medicine, Aden University in 2005. It is a case–control study enrolled 55 patients with breast cancer and 110 matched controls according to age and sex. The study was carried out in Al-Gamhouria teaching hospital, during the period January 1st 2003 to December 31st 2004. All the patients of breast cancer in this study were females.

Study IV (Gamal, 2008): a Thesis for Master degree in surgery – Faculty of Medicine Aden University in 2008. It is an observational prospective study in Aden public and private Hospitals, during the period September 2005through June 2007. It included 120 patients with the diagnosis of breast cancer .

All variables were reviewed and analyzed by using SPSS program 15.0. Descriptive analysis was performed in accordance with the main objectives to analyze the findings and to compare with the literature.

Results and Discussion

Epidemiologically,Yemen is considered as other Asian countries, as an area of low cancer risk (Ferlay et al., 2004; Hisham and Yip, 2004; Hortobagyi et al., 2005). However, several Yemeni studies confirmed that breast cancer is the first cancer in women (Al-Hadrani et al., 2000; Althobhani et al., 2001; Bawazir and Abdulhamid, 2002). In 2011, it was estimated that 230,480 new cases of invasive breast cancer were diagnosed in women in the Untied States, along with 57,650 new cases of non-invasive (in situ) breast cancer (US Cancer Statistics 2012). While from data available on the cancer burden in

Table 1. Breast Cancer Patients Distribution by Sex

Gender	Study I		Study II		Study III		Study IV		Total
	No	%	No	%	No	%	No	%	No
Female	225	99	74	100	55	100	119	99	473
Male	2	1	0	0	0	0	1	1	3
Total	227	100							

Table 2. Breast Cancer by Age

Years	No. of patients in each study					Total
	Study I	Study II	Study III	Study IV		
<20	1	0	0	0	1	0..2
20-29	8	3	2	3	16	3.4
30-39	72	15	12	26	125	26.3
40-49	79	30	14	40	163	34.2
50-59	45	15	11	27	98	20.6
60-69	14	5	16	18	53	11.1
≥70	8	6	0	6	20	4.2
Total	227	74	55	120	476	100

Table 3. Breast Cancer Patients According to Time of Presentation

Time of presentation (months)	No. of patients		Total	
	Study II (74)	Study IV (120)	No	%
<1	10	0	10	5.2
1-3	44	24	68	35.1
4-6	20	87	107	55.1
>6	0	9	9	4.6

Table 4. Breast Cancer Patients According to Type of Presentation

Clinical Presentation	No. of patients		Total	
	Study II (74)	Study IV (120)	No	%
Lump confined to breast	32	76	108	55.7
Skin involvement	10	12	22	11.3
Fungation	6	2	8	4.1
Peue de orange	10	16	26	13.4
Nipple involvement	6	6	12	6.2
Edema of the arm	4	0	4	2.1
Fixation to chest wall	4	1	5	2.6
Previous mastectomy scar	2	0	2	1
Palpable axillary lymph nodes	62	53	115	59.2

*Percentages cannot be added to 100% due to multiple

Table 5. Breast Cancer Patients by Clinical Stages of Breast Cancer

Clinical Stage	No. of patients				Total	
	Study II (74)		Study IV (120)		No	%
In situ	0	0	2	1.7	2	1.1
I	4	5.4	16	13.4	20	10.3
II	26	35.1	46	38.3	72	37.1
III	36	48.7	48	40	84	43.3
IV	8	10.8	8	6.6	16	8.2

Table 6. Breast Cancer Patients by Histopathological types

Carcinoma in situ%	No. of patients			Total	
	Study I (227)	Study II (74)	Study IV (120)	No (421)	%
Carcinoma in situ	2	0	2	4	1
Invasive lobular carcinoma	13	8	9	30	7.1
Paget's disease of nipple	0	3	1	4	1
Sarcoma	3	1	2	6	1.4
Lymphoma	1	0	0	1	0.2
Invasive duct carcinoma	208	62	106	376	89.3

Table 7. Breast Cancer Patients by Type of Surgical Treatment Performed

Type of treatment	No. of patients Studies II and IV (n=194)	%
Modified radical mastectomy	97	50
Simple mastectomy	53	27.3
Radical mastectomy	21	10.3
Lumpectomy	10	5.2
No surhery	13	6.7

Europe , in 2004, breast cancer incidence was estimated to be 370,100 cases in Europe and 283,000 cases in the European economic area plus Switzerland (Boyle and Ferlay, 2005).

Occurrence of breast cancer in young age groups were reported in the four used studies (Table 2) and previous Yemeni studies (Bawazir et al., 1998; Al-Hadrani et al., 2000; Bawazir and Abdulhamid, 2002) as well as studies from Arab countries including 48.49 years in Saudi Arabia (Jamal, 2001), 49 years in Jordan (Aghassi et al., 2002), 49 years in Lebanon (El-Saghir et al., 2002) and 48 years in Egypt (Elatar, 2002) . These figures are lower than the mean age of breast cancer in the West which is around 60 years (Boyle and Ferlay, 2005; Parkin et al., 2005; Jemal et al., 2010). In the United States, breast cancer occurred in 80/100,000 women at 50 years of age rising to 350/100,000 women at age of 70.25 years (Lacy et al., 2002).

In Table 3, majority of patients (94.8%) were presented after one month of discovering the breast symptoms. Around half (55.1%)% of patients were presented between 4–6 months and one third (35.1%) between 1–3 months. Table 4 shows that 45% of patients presented with advanced local disease, while 59.2% had palpable axillary lymph nodes on diagnosis. Table 5 shows that early breast cancer (stages I and II) occurred in 47.4%, carcinoma in situ 1.1 % and late breast cancer (stages III and IV) in 51.5% . This referred to the dominated clinical features of delayed presentation, advanced local disease and regional axillary lymph node involvement. Late presentation and bulky breast cancer in relatively young women has been documented in Yemeni patients (Al-Hadrani et al., 2000; Bawazir and Abdulhamid, 2002), Arab countries (Jamal, 2001; Aghassi et al., 2002; El Saghir et al., 2002; Lawrence et al., 2003) and elsewhere in Asia and Africa (Hadi et al., 2002; Hisham and Yip, 2004; Walker et al., 2004; Ward et al., 2004) which is different from the findings in Western countries where women at a mean age of 57 years present with cancer in the early and curable stages (Bray et al., 2004; Ferlay et al., 2004; Jemal et al., 2010). Although there are well described differences in breast cancer outcomes by race and ethnicity (Chlebowski et al., 2005; Smigal et al., 2006). These differences raise many questions as whether breast cancer has a different biological behavior in Arabs and in Africans (Jamal, 2001; Lawrence et al., 2003; Walker et al., 2004; Fregene and Newman, 2005; Hortobagyi et al., 2005) or either delay in presentation and seeking medical advice-which was clear in our study- due to cultural, social and religious believes (O'Malley et al., 2003; Ward et al., 2004; Chlebowski et al., 2005; Lagerlund et al., 2005) were the underlying cause. In Yemen, the socio-economic factors, cultural and religious believes are important contributing factors for delayed presentation. However, there is a need for large scale population based-studies in respect to familial history of the disease, other epidemiological data and study of the tumor biomarkers in order to answer such speculations. In developed countries, mammographic screening for women aged 50–69 years is proved effective in reducing breast cancer mortality (Breen et al, 2001; Olsson et al, 2000; Shen et al, 2005). Evidence that at least part of this decline can be attributed to screening comes

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from the expected increase in incidence of early stage and in situ breast cancers, followed by a decline in advanced cancer and subsequent mortality (Blanks et al., 2000; Nyström et al., 2002; Anderson et al., 2006). In this study (Table 6), invasive ductal carcinoma was the commonest (89.3%) nearer to what were reported otherwise (Jamal, 2001; Elatar, 2002; Walker, 2004; Saunders, 2008; Jemal et al., 2010) but with only 1% carcinoma in situ. This confirmed the real need for early detection programs. In developed countries, the incidence of ductal carcinoma in situ (DCIS) is increasing significantly in the last 20 years, paralleling the increase in the use of screening mammography. Nowadays, ductal carcinoma in situ represents 25% to 30% of mammographically detected breast cancer (US statistics, 2012; Jemal et al., 2010).

Other requirement in our hospitals is the immune-histopathology to know the hormonal status of breast cancer, which is important in the treatment and follow up of these patients. In this series, patients with cancer of breast were mainly treated in surgical department, the main surgical treatment in our series (Table 7) was mastectomy (modified radical mastectomy 50% and simple mastectomy 27.3%). This option often had been selected because of absence of local radiotherapy center and the advanced tumors or stage at presentation. Chemotherapy and hormonal therapy were given when indicated either in the hematological or surgical wards. Patients who need radiotherapy or advanced oncological assessment were referred for treatment abroad at the government expense (most of the patients were delayed). The role and benefits of chemotherapy and hormonal therapy in early and advanced breast cancer are proved well and extensively investigated (Sledge et al., 2003; Kaufmann et al., 2003; Buzdar et al., 2005; Sainsbury, 2008). Many studies in developed countries suggested that, the declining breast cancer–related mortality rate has been attributed to a combination of earlier detection via mammography and increased use of adjuvant hormonal and chemotherapies (Bray et al., 2004; Jemal et al., 2004; Ferlay et al., 2004; Anderson et al., 2006). Other studies reported that , factors known to contribute to racial disparities in mortality include differences in exposure to underlying risk factors, access to high-quality screening, and timely diagnosis and treatment (Vorobiof et al., 2001; Walker et al., 2004; Jemal et al., 2010). A likely contributory factor to improved outcome, as noted in the UK, has been the establishment of treatment protocols, improved chemotherapeutic options and better therapeutic guidelines (Blanks et al., 2000).

In conclusions, breast cancer in the studied patients was a disease of young (30-50 years) with late presentation and advanced disease. Invasive ductal carcinoma was the dominant histopathological type. Patients with breast cancer were mainly treated in surgical department, while mastectomy was the main selected surgical procedure.

Acknowledgements

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