Breast Cancer In Men: A Review of Epidemiology, Risk Factors, Diagnosis And Prevention In Africa.

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ABSTRACT

The male breast in spite of being rudimentary is subject to the full spectrum of disease that affects the female breast. Male breast cancer is a rare condition globally, accounting for only 1% of all breast cancer. However, there is a wider
increase in prevalence of this cancer in Africa approximately 5% – 15% as compared to developed nations. In Nigeria, several studies have shown prevalence in the range of 3.7% to 9.0% of all breast cancer cases. Mutation of BRCA 2 gene accounted for most of the cases of male breast cancer occurrence; other genetic conditions are BRCA 1 mutation, Klinefelter’s syndrome and Cowden’s disease. In addition, other risk factors associated with the disease are radiation exposure, hyperestrogenism, occupational and environmental exposure. Diagnostic methods include fairly specific techniques like routine light microscopic examination of haematoxylin and eosin stained sections of formalin fixed paraffin embedded biopsies, immunohistochemistry, fluorescent in situ hybridization and gene expression profiling. There is need for more public awareness program which focuses on behavioral modulation of diet, regular self-breast examination especially for those at risk and avoidance of exposure to environmental carcinogens.

KEY WORDS: Male breast, gynaecomastia, carcinoma, risk factors, diagnostic methods and prevention.

INTRODUCTION

Cancer can develop in any part of the body including breast of both male and females. Male breast cancer is rare compared to that of the female but they have similarities with few differences, as a result of which their diagnosis and treatment are almost similar [1, 2]. Several risk factors has been associated with development of male breast cancer which include family disposition, hyperestrogenism which may be caused by Klinefelter’s syndrome and liver cirrhosis, radiation exposure most especially at the chest region, testicular disorders, dietary source, aging and obesity [3].

Some of the signs and symptoms of breast cancer in males comprise of firm, non-painful mass located just below the nipple, skin dimpling around the breast region, nipple retraction, redness of the nipple or breast skin, bloody discharge from the nipple and ulceration of the skin in advanced cases [4]. Pathogenesis of breast cancer in both sexes is essentially similar; much of this is linked to exposure to sex steroids (estrogen and progesterone) and activity of receptor tyrosine kinases (RTK) located on the surface of the breast parenchymal cells [5, 6].

Invasive ductal carcinoma (Not Otherwise Specified – NOS) is the most common histopathological type of breast cancer in males [7]. At least 8 out of 10 male breast cancers are invasive ductal carcinomas alone or mixed with other types of invasive or in situ breast cancer [8].

METHODOLOGY

This review paper involved gathering of already published articles and literature documents on male breast cancer. They were then extensively analyzed
and presented as it affect African populace most especially Nigeria.

EPIDEMIOLOGY
Male breast cancer is a rare disease. It accounts for only about 1% of all breast cancer [9]. It was estimated that in 2013, about 2,240 new cases of breast cancer in men would be diagnosed and that breast cancer would cause approximately 410 deaths of men in United States [8]. Approximately 350-400 new cases of breast cancer in males are diagnosed annually in the United Kingdom [10]. A man’s lifetime risk of developing breast cancer is 1 in 1000, it can occur at any age, but it is mostly detected in the 60-70 years age group in developed countries [8].

The incidence of breast cancer in men has been increasing globally; one report suggested that incidence has increased 26 percent over the past 25 years [11]. In Africa, various researches conducted in the region have shown a wider increase in male breast cancer occurrence and mortality rate as compared to the developed countries. Incidence of male breast cancer is much higher in sub-Saharan Africa, approximately 5%-15% [12]. When they present, the tumours are often at advanced stages with poorer prognoses [7]. A meta-analytical study on male breast cancer in African males indicated that the average age of occurrence was 54.6 years, which is 7 years older than the female counterparts [13].

Reasons for the differences in mortality rates between developed countries and African countries include advanced stages at presentation, worse biologic behavior, poor treatment facilities and poor patient acceptance of recommended treatments, which has been attributed to ignorance, superstition, self-denial, fear of mastectomy and unavailability of treatment facilities [14, 15].

In Tanzania for example and areas of central Africa, breast cancer accounts for up to 6 percent of cancers in men [16]. Similar researches in Uganda and Zambia showed 5% and 15% respectively [17, 18].

Male breast cancer in Nigeria represents 3.7-8.6% of all breast cancers; this is higher than the 1% recorded from other parts of the world [19]. Majority are invasive ductal carcinoma which is characterized by late presentation at advanced stage with attendant poor prognosis [9].

RISK FACTORS
The exact cause of male breast cancer is not known but there are risk factors that make someone susceptible to develop the disease over a period of time. They include:

A. Genetic: Familial disposition just like that of the women breast cancer increases the risk of developing male breast cancer. Men that have first degree relatives with history of breast cancer tend to be susceptible to have the disease in the future. Basham et al [25] stated that 15-20% of male breast cancer cases originate from family history. Men can have mutation on breast cancer gene BRCA1 and BRCA2 but the latter is more common in this sex [26]. A
male with BRCA2 mutation carries an increase 6% life time risk of having the
disease than 0.1% in the normal population. Other genetic condition that
increases susceptibility to the disease is Klinefelter’s syndrome [27].

B. Radiation Exposure: Frequent exposure to ionizing radiation has been
associated with an increase risk of developing breast cancer in both men and
women [7]. Men with history of undergoing chest x-ray or radiation therapy
frequently have a greater chance of having the disease [28]. Therefore, prolong
exposure to radiographs may be
harmful to individuals. Even workers that expose themselves to electromagnetic
waves and other radiations daily without adequate protection are at risk [29].
C. Hyperestrogenism: Certain conditions can result in abnormally high levels of
estrogen in men thereby increasing the risk of developing breast cancer. About
80-90% of male breast cancer has estrogen receptor meaning they are ER positive.
Klinefelter’s syndrome and cirrhosis of the liver have been found to cause
increase estrogen level in men [30]. Other conditions affecting estrogen in
relation to androgen levels are taking exogenous estrogen as medication, mumps
ochitis and testicular dysfunction [8]. Obesity also increases risk of breast
cancer due to conversion of androgen hormone by the fat cells into estrogen;
this means that obese men have higher level of estrogens in their body which
subsequently may cause breast cancer [31].

DIAGNOSIS
A number of diagnostic methods are available. They include:
1. Medical history and physical examination: The medical history may give some
clues about the cause of any symptom on the patient and tendency of having
increase
risk factor(s) of developing breast cancer [8]. A thorough clinical breast
examination will assist in locating any lumps or suspicious areas and assess the
texture, size, and relationship of the breast to the skin and muscle tissue
[32].

2. Biopsy: this involves removal of tissue sample from the body for examination
under the microscope. There are different ways of obtaining tissue biopsy namely
fine needle aspiration, core needle biopsy and surgical biopsy [33]. Majority of
male breast cancers are invasive ductal carcinoma (80-90%) while ductal
carcinoma in situ accounted for 10% [34, 35]. Cancer of lobular origin made up
of only 1% due to lack of abundant lobules in male breast, others include
Paget’s disease (1%), mucinous (1%), medullary and invasive papillary has 2% of
occurrence each [36, 37, 38]. Special techniques are employed to further
diagnosed breast tissue histopathologically as below:

1. Immunohistochemistry (IHC): This is a method of employing specialized
antibodies against specific antigens on the cell membrane or nuclear region of
the breast cancer cells. The standard tests include estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor (HER2) and Ki67 tests for invasive breast cancers [37]. About 90% of male breast cancers are ER positive and 16% of the cases over-expressed HER 2 [39].

2. Fluorescent in situ hybridization (FISH): This test uses fluorescent pieces of DNA that specifically stick to copies of the HER2/neu gene in cells, which can then be counted using a fluorescent microscope. Many breast cancer specialists think the FISH test gives more accurate results than IHC, but it is more expensive and takes longer to get the results. When IHC result is 2+, the HER2 status of the tumor is not clear and the tumor is then tested with FISH for confirmation [8, 40].

3. Genetic Testing: Genes are tested on the sample so as to understand the biology of the tumour. Some cancers are fast growing while others are not depending on the type of individual genes they possess. Examples of gene testing methods include Oncotype Dx™ and Mammaprint™ [38].

4. Imaging Tests: Different imaging techniques are use in assisting diagnosis of breast cancer, the methods are diagnostic mammography, ultrasound, magnetic resonance imaging [38]

5. Other Tests: There are several other tests use in assisting diagnosis of breast cancer namely nipple discharge examination, blood tests, X-ray, bone scan, computed tomography and positron emission tomography [8].

PREVENTION

There is need for men to take necessary steps in preventing themselves from having breast cancer by carrying out and observing the following steps:

1. Regular self examination: A person’s best chance of surviving breast cancer is early detection through regular self-examinations. Men should be familiar with the normal feel of their breast tissue so that they can bring any lump or change to the hospital for proper attention.

2. Active participation in exercise activities: It has been realized that increased physical activity is associated with decreased breast cancer risk. This may be because exercise lowers hormone levels, boosts the immune system, and changes metabolism while lack of exercise contributes to obesity.

3. Making healthier food choices: Several researches has shown immense important of particular food substances in preventing development of breast cancer and many other types of cancers. They contained antioxidants and other essential elements that repair and prevent cells from the damaging effects of free radicals and other carcinogens. Examples include tomatoes (lycopene), green vegetables (beta-carotene, folate, Vitamin C, E and K), berries (anthocyanins), onion (quercetin) and sweet potatoes (beta-carotene and Vitamin C).
4. Optimizing Vitamin D source: Vitamin D influences virtually every cell in the body and is one of nature's most potent cancer fighters. This can be done by appropriate sun exposure or by using Vitamin D supplements.

5. Avoidance of unnecessary exposure to radiation/Environmental pollution: Getting medical imaging studies only when they are necessarily needed and avoidance of environmental pollutions help in cancer prevention.

6. Quitting smoking and sleeping well: Researches has shown cigarette smoking is associated with cancer development because it is injurious to the overall health of an individual. Avoidance of smoking is an essential mean of preventing cancer and having enough sleep maintain someone hormonal balance for a healthy living [41, 42, 43].

CONCLUSION:
Although cancer of the male breast is rare, when it occurs, it presents at an advanced stage especially in resource poor settings. This underscores the need for use of simple and painless preventive measures.

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