# BREAST CANCER PREVENTION AND DETECTION

***Professor C.H. Ihezue***, *FWACS, FMCS, (FRCS), FICS*
***Sister Dr A.A. Anele***, *FWACS, FMCS*

## INTRODUCTION

The breasts are phylogentically considered as modifications of sweat glands. They are present in all mammals, and particularly become prominent in females as the hallmark of pubertal development. Like all bilateral structures, slight inequality in the size of the breast is normal. The male breast is small, though it is subject to the major diseases of the female breast[1].

Breast symptoms induce such anxiety in the patient that malignancy needs to be excluded or confirmed and dealt with accordingly as soon as possible.

Cancer of the breast is the commonest malignancy affecting women in many parts of the world [1,2]. Globally, it accounts for 8.4% of female cancers but less than 1% of all cancers in the male, and 0.1% of male death. The incidence is rising. In the USA, about 175,000 new cases are diagnosed in the females, and about 46,000 die of it annually. In Britain, the corresponding numbers are 25,000 and 16,000. Japan has the lowest incidence 1 in 60 women in their life time, and the death rate is 30% of that in Britain [1].

In Africa, the true incidence is not known, but the disease is becoming more common. In Accra Ghana, it accounts for 13,0% of all female cancers, 2nd only to cancer of the cervix. In University College Hospital (UCH) Ibadan from 1960 - 80, cancer of the breast contributed 6% of the 17,496 cases of cancers seen. It was the 4th commonest after cancer of the cervix [1].

In Jos the Plateau State of Nigeria, a 6-year retrospective study from 1979 - 1984 by Ihezue et al showed an incidence of 13 new cases annually. This correlates well with the figure of 10.6 new cases a year reported in the South Eastern part of the country by other observers. Interestingly, no male patient was recorded in this study [2]. However recent works in 1996, by Gukas,1999 by Igun recorded one male patient each [3,4].

## AETIOPATHOGENESIS

The cause of breast cancer is unknown. However, certain factors have been associated:

Age: Carcinoma of the breast is rare below the age of 20, butthereafter the incidence steadily rises so that by the age of 90, nearly 20% of women are affected 1. The study in Jos showed the peak incidence to be between 45 - 54 years [2].

Gender : Breast cancer appears to be predominantly a female disease[5].

Genetic : Positive family history is a strong factor[5]. A woman whose ground mother, mother, aunt or sister had the disease has greater risk. The children or sisters of a woman who develops bilateral breast cancer have 50% chance of having the disease between 20 and 40 years.

. Endocrine :

- Those who have their first child at 18 or less are more protected than those having it after 25. Nulliparity increases the risk, and unmarried nulliparous woman have a greater risk than those who are married[1].
- Woman with early menarche (before 12) or late menopause (after 50) have 11/2 times greater risk than those with menarche at normal age or menopause by 45 [1].
- It is highly probable that oestrogen is closely associated with breast cancer. This is supported by the increasing risk with age, longer period of menstrual activity, also the fact that about 70% of tumours are oestrogen dependent. The incessant high levels of oestrogen excite breast cell proliferation and increase the number of mutant (cancer) cells[1].

. Previous breast cancer: It is 16x higher. 15 - 16% of patients treated of cancer of the breast develop cancer in the contra-lateral breast[1].

. Benign breast disease: The incidence is 4x due to associated hormonal imbalance[1].

. Other Factors [1,5].

- Diet:
- Drug like thyroid hormones, Rauwolfia compounds, Contraceptives,
- Alcohol

Some unpublished works have implicated, stress, Vit $B_{12}$ deficiency.

A brief relevant Pathology shows that the development of cancer in many patients appears to be linked with abnormal increase of a growth enhancing gene (GEG). This is the Her-2.neu oncogene on chromosome 17 [1]. Interestingly, two other breast cancer susceptibility genes have recently been identified: BRCA1 on chromosome 17 and BRCA2 on chromosome 13 [6,7]. There is a common AA deletion in exon 11 of BRCA1 at position 2800 of the aa chain (AA 2800). Once an individual is homozygous, there is a naturally occurring human "knockout" for this gene. However, the good news is that rapid and efficient method for screening for this mutation in suspected familial breast cancer has been evolved [7].

## PREVENTION

## PROBLEM IDENTIFIED, PROBLEM SOLVED!!

Unfortunately, the precise cause of breast cancer has not been identified. We only talk of associated factors, most of which nothing can be done. If we have not identified the problem; how then can it be solved? Our best and only option then is to work towards attacking cancer before the ugly and devastating head is reared. Thus nipping it at the bud by expeditious management. We then work hard scientifically and otherwise to make a break through towards identifying the cause; so that prevention can be achieved.

Most of the aetiological (associated) factors can not be manipulated. Nothing can be done to stop aging for instance. Control of only the minor factors like high fat intake, stress, drugs can be attempted.

The strategies for adoption include:

. Mass literacy programme to render people compliant especially the female folk.
. Strong public awareness campaign down to the grass root, so that the least suspicion of breast cancer compels the individual, to the doctor for appropriate actions.
. Bringing health care facilities to the grass root.
. Making medical knowledge available to the common man, by writing book/pamphlets in simpler and comprehensive languages, if possible vernacular.
. Providing adequate incentives to the rural areas so that medical Consultants can accept postings in these areas.
. Giving the desired priority to health and research in the budgetary allocation.
. Strong thought should be given to the predictive identification of the homozygous individuals for the AA deletion in exon 11 of BRCA1 at position 2800 (AA2800)7. This will help the patient, the geneticist and the surgeon to make more informed decisions with regard to the risk of developing breast cancer, not only in a single patient but in subsequent generations [7].

**DETECTION**: The revolves around history, physical examination and investigations.

There should be major revolution in the pre-operative diagnosis of breast cancer, from " tactile sensation", mammography, through stereolaxis (fine needle localization and biopsy) of non-palpable cancer to the various image guided percutaneous biopsies [3,8,9]

Various techniques have been employed:

FNABC [10]: Here negative pressure is employed using size 21G needle. A film of tissue lodged in the needle is smeared and fixed in 70% ethyl alcohol. These are sent for Haematoxylin, and Eosin and Papanicolaou respectively. However, a high level of accuracy can be achieved only by skilled cytologist.

.NEEDLE BIOPSY 10: This can be Tru-cut biopsy. Here local anaesthesia is infiltrated on the area to be biopsied, which will subsequently fall into the field of incision at the definitive surgery. A thin core of tissue for standard histology is sent. Tissue can as well be taken for estrogen receptor status[11]. Some work has been done on these two procedures in Jos. Both FNABC and Tru-cut biopsies showed acceptably high diagnostic accuracies of 89.2% and 93.5% respectively [3].

.Incisional especially in fungating lesions, and Excisional biopsies are other modalities.

An urgent paraffin histology is preferred to frozen-section in some centres. This is because even when frozen section is used, the answer cannot always come immediately in the case of difficult proliferative lesions [10]. However, as a result of intuition and extensive publicity campaign, it is widely believed that the earlier breast cancer is diagnosed, the better [8] There is therefore great interest in programmes designed to "screen" asymptomatic people for cancers. However, for any screening programme to be worthwhile; Two questions must be answered in the affirmative [8].

. First: does it work; i.e does the screening technique succeed in diagnosing cancer earlier?
. Second, does the patient benefit by having the cancer diagnosed at an earlier stage? If the answer to either of these questions is negative, then we do not have to go on to analyse cost and benefits. Interestingly, there is extensive evidence that the first question can be answered positively: Using Mammography, breast cancer can be detected at a pre-clinical stage [8]. In the Breast Cancer Detection Demonstration Project (BCDDP) in Canada, and the Health Insurance Plan of New York study (HIP), it was found that cancers detected at mammography tend to be smaller, and are associated with a lower rate of axillary node metastasis [8].Luoma et al demonstrated clearly and convincingly that their technique of breast biopsy with fine wire localization for mammographic lesions is both feasible and accurate [8]. Unfortunately, the answer to the second question is not clear. It is not generally understood that any screening technique that successfully diagnosis cancer earlier automatically improves the " prognosis". Be that as it may, even if no other benefit is produced, earlier diagnosis gives an earlier starting point for counting the years of survival [8].

To be worthwhile, screening must result in a reduction in breast cancer death, using the screened population as the denominator, not just the number of cases found. If we assume for the moment that the benefit of screening is real, we may then assess how large that benefit is in relation to morbidity and costs in order to answer the most important question of all i.e. should mass screening be implemented?[8]. It is remarkable how the morbidity caused by breast cancer screening tends to be suppressed in the enthusiasm for its implementation. A suspicious lesion on mammogram usually leads to biopsy [8,10] The false positives far outweigh the cancers found: i.e. screening causes a considerable number of unnecessary operations. We must recognize the false reassurance of a negative mammogram in patients with fast growing breast cancer [8]. The risk of radiation-induced breast cancer may be extremely small, but it is real. Though this has been lowered by the 10-fild reduction in the required radiation dose [8,9].

Finally, the financial implications of an accessible nation-wide screening programme for breast cancer are staggering, especially in our West African sub-region where the resources are either unavailable or unaffordable.

All the same, going by the recommendation by the American Cancer Society [8]

.All woman should be instructed in the breast self examination and encouraged to examine themselves monthly.
.Physical examination should be performed every 3 years for woman between the ages of 20 and 40 years, and annually thereafter.
.A mammogram should be obtained as a baseline between the ages of 36 and 40 years.
.Women between the ages of 40 and 50 should have mammogram every 1-2 years depending on patient risk.
. Annual mammogram should be obtained for women over 50 years.

Xeromammography [10] (a technique of producing a non-transparent print of X-ray densities by means of selenium plate exposed to X-ray) has better details.

For diagnostic purposes mammography is done in 2-planes - Craniocaudal and mediolateral or just a single oblique view.

The following mammographic features may be evident [10]:
. Spiculed lesions
- pathognomonic for cancer

. Clustered microcalcification
. Microlubulation
. Architectural distortion
. Dialated ducts
. Asymmetric density.

Modified Wolfe's classification of mammographic appearances to identify patients at risk[9].

N1 - Normal
D1 - Minimally prominent duct pattern
D2 - Severely prominent duct pattern
D-1 - Diffusely radio dense or dysplastic breast.

Tumour markers currently being evaluated include[10]:

. Enzymes like Gamma GTP
. Acute phase reactants, like C-reactive proteins
. Other proteins like, pregnancy macroglobulin
. Oncofetal antigens e.g. CEA
. Immune complexes.

These serve as screening, prognostic, as well as detection of recurrence.

## CONCLUSION

Current emphasis is still on attenuation of the deadly effects of breast cancer, since these is as yet no known specific causative agent identified. In view of the number of false negative results, cytology alone is unreliable and it should be used in breast screening, as part of a full triple assessment by clinical examination, radiology and cytology in the case of palpable lesions; and double assessment by radiology and cytology for non-palpable tumours. This has stood the test of time in the demonstration of high pre-operative diagnostic accuracy[3,8,9].

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