

BREAST CANCER AND DIET: A REVIEW

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ABSTRACT

In worldwide, breast cancer is most common cause of cancer among women and in India approx. 2 million new cases occurs per year. After suffering from breast cancer the patient can improve their health by intake of fruits and vegetables or low consumption of saturated fatty acids. Risk of breast cancer such as age, genetic mutation of breast cancer, family history or other factors include is reproductive risk factors. Smoking causes about 80-90 % of cancer death. Women's breast composed of thousands of lobules, fat and connective tissue. Treatment of breast cancer depend on some factors i.e. surgical treatment, radiation therapy, chemotherapy etc. Following a healthy dietary pattern can reduce the risk of breast cancer.

KEYWORDS: *Breast Cancer, Diet, Reproductive Risk Factors, Screening, Treatment*

INTRODUCTION

Breast cancer is one of the most leading causes of morbidity and mortality for women worldwide [1, 2]. Breast cancer can commonly moving to distant organ such as brain, lung, liver and bone which mainly accounts for untreatable [3]. In worldwide, 25 % of breast cancer cases occur due to obesity/overweight or a sedentary lifestyle [4]. According to Indian population 1, 00,000 to 1, 31,000 cases rise annually [5]. By 2030, the universe occurrence of breast cancer will be increase more than 2 million cases per year in India [6, 7, 8]. The risk factors include reproductive factors such as number of children, older age at full term birth and duration of breastfeeding [9, 10]. In Indian women, cervical cancer is most common, and in rural India, cervical cancer still most common [11].

Screening

Some diagnostic procedures lead the detection of breast cancer:

Clinical examination; mammography; breast ultrasound; and breast magnetic resonance imaging (MRI)[12].

Clinical breast examination (CBE) is one of the components of the triple assessment performed on the patient's first encounter with a health professional for evaluation of breast lumps [13, 14]. A large percentage of breast cancers was detected by the patients themselves either by self-examination (25 %) or by accident (18%)[15]. In clinical practice breast lumps are very common, most of them being benign [16, 17, 18, 19]. It is therefore, important to see CBE in this context also, so that further investigations should be directed for those patients only who really need further evaluation rather than submitting every patient to scan and biopsy [20].

A mammogram is an X-ray, particularly suited to woman breast to detect nodules whose presence may indicate the existence of breast cancer [21]. It should be noted that mammography does not always provide a definitive diagnosis on

the presence or absence of cancer: it allows doctors to see if there is an abnormality in the breast. The radiologist is consequently led to analyze the mammogram and perform a physical examination (appearance of the skin and nipple). Other tests are then necessary to establish the diagnosis (breast ultrasound, breast MRI and sampling). The computer-aided diagnosis (CAD) improves accuracy in the interpretation of considered mammograms, early detection of possible tumor and distinguishing between benign and malignant ones [22,23,24].

Breast ultrasound is a relatively inexpensive, readily available modality that does not use ionizing radiation, can be used for interventional procedures, and is generally well tolerated by women [25].

The main applications of breast ultrasound are

- to differentiate between cystic and solid lesions,
- to evaluate palpable masses not visible mammographically, and
- to evaluate young and pregnant patients with palpable masses.
- Some reports have also suggested the use of ultrasound to determine lymph node status [26,27].

MRI has traditionally been used as a second-line imaging method to solve diagnostic problems in patients with equivocal findings on mammography or ultrasound. The use of breast MRI for screening has increased over the past decade [28,29,30]. In these women, MRI screening shifts the stage distribution of breast cancers toward lower stages and reduces the fraction of interval cancers. Although results from randomized prospective screening trials are lacking, there is indirect evidence to suggest that MRI screening helps improve the prognosis of women at increased risk of breast cancer [31, 32].

Family and Breast Cancer

Suffering from disorder, therapeutic problems, concern about family future and mentally disturbed are among factors that impair mental health of patients with breast cancer. Breast cancer is one of the most important factors for social health women, mental. Some medicinal complication disturbs the patient self confidence, self awareness and acceptance [33]. Most of all breast cancer cases are related to family history [34]. In these circumstances, several factors including the losing sense of control, economic problems and family crisis etc. [35].

Risk Factors

Risk factors of cancer include deficiency of iodine in diet [36], increased hormone level [37], and include age [38]. Both exogenous and endogenous are related with the risk of breast cancer [39]. Additionally, correlation of a family history of breast cancer with higher risk of the disorder has long been established [40,41].

Breast cancer is a highly heterogeneous disease that is developed by mutual impact of genetic risk factors. Although epidemiological evidence highlight the presence of risk factors (such as age, obesity, alcohol use, and exposure to estrogen in lifetime), family history is the strongest one. Almost 20% of all breast cancers have family origin, and etiologically are dependent to a specific predisposing gene of that disease [42].

Living in rural areas decreases the risk for breast carcinoma as compared to urban counterparts mainly due their adherence to rural lifestyle [43].

Although the relationship between smoking and breast cancer risk remains controversial, mutagens from cigarette smoke have been detected in the breast fluid from non-lactating women [44].

Treatment

Treatment depends on the stage of cancer. It consists of surgical treatment, radiation therapy, chemotherapy etc.

Last 20 years, surgery for breast cancer has massive changes. In 1980s, Halstead introduced the radical mastectomy and in many countries, it still remains standard therapy or lack a specialized focus for breast disorder [45,46].

Radiotherapy is necessary for breast – conserving treatment [47,48], current evidence recommend a small effect of diagnostic radiography on breast cancer, such that less from one percent of breast cancer cases probably results from diagnostic radiotherapy [49]. The risk of breast cancer is reduced among patients treated by radiation therapy, almost certainly because of exposure of ovarian cells to the radiation [50], while radiation therapy may increase the risk of contralateral primaries [51, 52].

Chemotherapy is generally recommended for those patients with disease at higher risk of reoccurrence. The following characteristics may be indicates the chemotherapy: HER2 – negative ; HER2 – positive ; ER -, PR -, large tumor size ; and positive lymph nodes [53].

Diet in Breast Cancer

Kopans and Greenwald put that increase BMI in post – menopause higher the risk of breast cancer; there is not interrelation in premenopausal women. Weight gain and high calorie intake are causes of breast cancer occurrence [54]. On the one hand, calorie intake causes the risk of weight gain and obesity. On the other hand, increased height in childhood and preterm menopause. These factors are established for cancer growth in future [55]. High intake of fruits and vegetables may decrease the risk of breast cancer [56]. In premenopausal women, high intake of phytoestrogen can compete with the endogenous estrogen. Phytoestrogen increase the estrogen activities in women with low level of endogenous estrogen, e.g. postmenopausal women [57, 58, 59].

CONCLUSIONS

Breast cancer is the frequent growing malignant disease. The main cause of the study is to cure breast cancer through diet, ensuring a good quality of life case are detected an early stage of development, when treatment is effectual then there is a chance of cure. Around 90 % of breast cancer cases detected by mammography. Early detection can reduce the mortality rate in women. The role of the fruits and vegetables may decrease the lower risk of breast cancer. High phytoestrogen intake can reduce the overall estrogen exposure to target tissue and phytoestrogen also increase the estrogen activity in women.

REFERENCES

1. Toriola AT, Colditz GA. Trends in breast cancer incidence and mortality in the United States: implications of prevention. *Breast Cancer Res Treat* 2013; 138(3):665–73.
2. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. GLOBOCAN 2012 v1.0, Cancer incidence and mortality worldwide: IARC Cancer Base No.11. Lyon, France: IARC; 2013. <http://globocan.iarc.fr>.
3. DeSantis CE, Fedewa SA, Goding Sauer A, et al. Breast cancer statistics, 2015: Convergence of incidence rates between black and white women. *CA Cancer J Clin*. 2016; 66: 31-42.

4. IARC Working Group on the Evaluation of Cancer-Preventive Agents. *Weight Control and Physical Activity, IARC Handbooks of Cancer Prevention, Volume 6*. Lyon, France: IARC, 2002.
5. *Breast Cancer in Developing Countries. Lancet* 2009; 374:1567.
6. Fearlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM, et al. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer* 2010; 127:2893-917.
7. Mohite AP, Mohite RV. Dietary factors and breast cancer: A case control study from rural India. *Asian J Med Sci* 2014; 6:55-60.
8. Mohite AP, Mohite RV. Reproductive risk factors and breast cancer: A case control study from rural India. *Bangladesh J Med Sci* 2015; 14:258-64.
9. Rose DP, Vona-Davis L. Interaction between menopausal status and obesity in affecting breast cancer risk. *Maturitas* 2010;66:33-8.
10. Hemminki K, Försti A, Sundquist J, Mousavi SM. Preventable breast cancer is postmenopausal. *Breast Cancer Res Treat* 2011; 125:163-7.
11. Kaarthigeyan K. Cervical cancer in India and HPV vaccination. *Indian J Med Paediatr Oncol* 2012; 33: 7–12.
12. Schwab FD, Huang DJ, Schmid SM, Schötzu A, Güth U. Self-detection and clinical breast examination: Comparison of the two "classical" physical examination methods for the diagnosis of breast cancer. *Breast* 2015; 24(1):90–2.
13. Klein S. Evaluation of palpable breast masses. *Am Fam Physician*. 2005; 71: 1731-8.
14. Morris K T, Pommier R F, Morris a, Schmidt W a, Beagle G, Alexander P W, Fejel S T, Schmidt J, Vetto J T. Usefulness of the triple test scores for palpable breast masses. *Arch Surg*, 2001; 136: 1008-13.
15. Roth MY, Elmore JG, Yi-Frazier JP, Reisch LM, Oster NV, Miglioretti DL. Self-detection remains a key method of breast cancer detection for U.S women. *J Women's Health (Larchmt)*, 2011; 20: 1135-9. 17.
16. Klein S. Evaluation of palpable breast masses. *Am Fam Physician*. 2005; 71: 1731-8.
17. Muneer a, Tahir SM, Sheikh GA, Zia a, Sheikh AR, Fatima S. Breast lumps in adolescent and young female: are all benign? *JLUMHS*. September – December 2011; 10 (3): 112- 6.
18. Kumar R. A clinicopathologic study of breast lumps in Bhairahwa, Nepal. *Asian pacific journal of cancer prevention* 2010; 11: 856- 7.
19. Pradhan M, Dhakal HP. Study of breast lump of 2246 cases by fine needle aspiration. *J Nepal Med Assoc* 2008; 47: 205- 9.
20. Kearney AJ, Murray M. Breast Cancer Screening Recommendations: Is Mammography the Only Answer? *Journal of Midwifery & Women's Health* 2009; 54 (5): 393-400. 19. Miller AB, Baines CJ. <http://fr.wikipedia.org/wiki/Mammographie>
21. H.D. Cheng, X. Cai, X. Chen, L. Hu, X. Lou, "Computer-aided detection and classification of microcalcifications in mammograms: a survey", *Pattern Recognition* 36-2003, 2003, pp 2967 – 2991.

22. Oliver, J, Freixenet, R, Marti, R, Zwiggelaar, A comparison of breast tissue classification Techniques, MICCAI 2006, LNCS 4191, pp. 872-879, 2006
23. Oliver, J, Freixenet, J, Marti, E, Perez, J, Pont, E, Denton, R, Zwiggelaar, A review of automatic mass detection and segmentation in mammographic images, *Medical Image Analysis* 14 (2010) 87–110, 2010
24. Carkaci, S., Santiago, L., Adrada, B. E., & Whitman, G. J. (2011). Screening for breast cancer with sonography. *Semin Roentgenol* 46(4), 285–291.
25. Stavros AT. *Breast ultrasound*. Philadelphia: Williams andWilkins; 2004.
26. Jackson VP. The current role of ultrasonography in breast imaging. *Radiol clin North Am* 1995;33:1161–70.
27. Sardanelli F, Podo F, Santoro F, et al: Multicenter surveillance of women at high genetic breast cancer risk using mammography, ultrasonography, and contrast-enhanced magnetic resonance imaging (the High Breast Cancer Risk Italian I study): Final results. *Invest Radiol* 46:94-105, 2011
28. Lehman CD, Gatsonis C, Kuhl CK, et al: MRI evaluation of the contralateral breast in women with recently diagnosed breast cancer. *N Engl J Med* 356:1295-1303, 2007
29. Warner E, Hill K, Causer P, et al: Prospective study of breast cancer incidence in women with a BRCA1 or BRCA2 mutation under surveillance with and without magnetic resonance imaging. *J Clin Oncol* 29:1664-1669, 2011
30. Passaperuma K, Warner E, Causer PA, et al: Long-term results of screening with magnetic resonance imaging in women with BRCA mutations. *Br J Cancer* 107:24-30, 2012
31. Warner E, Hill K, Causer P, et al: Prospective study of breast cancer incidence in women with a BRCA1 or BRCA2 mutation under surveillance with and without magnetic resonance imaging. *J Clin Oncol* 29:1664-1669, 2011
32. Karimoi M, Pour Dehghan M, Faghieh Zadeh S, Montazeri A, Milani M. The effects of group counseling on symptom scales of life quality in patients with breast cancer treated by chemotherapy. *Behbood J of Kermanshah University*. 2007; 10(1):10-21.
33. Brewer HR, Jones ME, Schoemaker MJ, et al. Family history and risk of breast cancer: an analysis accounting for family structure. *Breast Cancer Res Treat*. 2017; 165: 193-200.
34. Holden J, Harrison L, Johnson M. Families. Nurses and intensive care patients: a review of the literature. *J of Clinical Nursing*.2002; 11(2):140.
35. Venturi S. Is there a role for iodine in breast diseases?. *Breast*. 2001; 10(5):379-382. 22. Aceves C, A
36. Yager JD, Davidson NE. Estrogen carcinogenesis in breast cancer. *N Engl J Med*. 2006; 354(3):270-282.
37. Steiner E, Klubert D. Assessing Breast Cancer Risk in Women. *Am Fam Physician*. 2008; 78(12):1361-1366.
38. Endogenous H, Breast Cancer Collaborative G, Key TJ, et al. Sex hormones and risk of breast cancer in premenopausal women: a collaborative reanalysis of individual participant data from seven prospective studies. *Lancet Oncol*. 2013; 14: 1009-1019.
39. Thompson WD. Genetic epidemiology of breast cancer. *Cancer* 1994; 74:279 –287.

40. Collaborative Group on Hormonal Factors in Breast Cancer. *Familial breast cancer: collaborative reanalysis of individual data from 52 epidemiological studies including 58,209 women with breast cancer and 101,986 women without the disease. Lancet* 2001; 358(9291):1389–1399.
41. Antoniou AC, Easton DF. *Models of genetic susceptibility to breast cancer. Oncogene.* 2006; 25:58-98.
42. Nagrani RT, Budukh A, Koyande S, Panse NS, Mhatre SS, Badwe R. *Rural urban differences in breast cancer in India. Indian J Cancer* 2014; 51: 277–81.
43. Knight JA, Fan J, Malone KE, et al. *Alcohol consumption and cigarette smoking in combination: A predictor of contralateral breast cancer risk in the WECARE study. Int J Cancer.* 2017; 141: 916-924.
44. Veronesi U, Salvadori B, Luini A, Greco M, Saccoczi R, del Vecchio M, et al. *Breast conservation is a safe method in patients with small cancer of the breast: long-term results of three randomized trials on 1973 patients. Eur J Cancer* 1995;31A(10): 1574–9.
45. Fisher B, Redmond C, Poisson R, Margolese R, Wolmark N, Wickerham L, et al. *Eightyear results of a randomized clinical trial comparing total mastectomy and lumpectomy with or without irradiation in the treatment of breast cancer. N Engl J Med* 1989;320(13):822–8.
46. *Treatment of early-stage breast cancer. JAMA* 1991;265:391-5.
47. Morris AD, Morris RD, Wilson JF, et al. *Breast-conserving therapy vs mastectomy in early-stage breast cancer: a meta-analysis of 10-year survival. Cancer J Sci Am* 1997;3:6-12.
48. Evans JS, Wennberg JE, McNeil BJ: *The influence of diagnostic radiography on the incidence of breast cancer and leukemia. N Engl J Med* 315:810-815, 1986
49. Boice JD Jr, Blettner M, Kleinerman RA, et al: *Radiation dose and breast cancer risk in patients treated for cancer of the cervix. Int J Cancer* 44:7-16, 1989.
50. Harvey EB, Brinton LA: *Second cancer following cancer of the breast in Connecticut, 1935-82. NCI Monoger* 68:99-112, 1985
51. Horn PL, Thompson WD: *Risk of contralateral breast cancer: Associations with histologic, clinical, and therapeutic factors. Cancer* 62:412-424, 1988.
52. Paik S, Shak S, Tang G, et al. *A multigene assay to predict recurrence of tamoxifen-treated, node-negative breast cancer. N Engl J Med.* 2004;351:2817-2826.
53. Greenwald P. *Role of dietary fat in the causation of breast cancer: point. Cancer Epidemiol Biomarkers Prev.* 1999; 8(1):3- 7.
54. Hanf V, Gonder U. *Nutrition and primary prevention of breast cancer: foods, nutrients, and breast cancer risk. Eur J Obstet Gynecol Reprod Biol.* 2005; 123(2):139-49.
55. *World Cancer Research Fund Panel (Potter JD Chair). Food, Nutrition and the Prevention of Cancer: a Global Perspective. Washington, DC: American Institute for Cancer Research, 1997.*

56. World Cancer Research Fund Panel (Potter JD Chair). *Food, Nutrition and the Prevention of Cancer: a Global Perspective*. Washington, DC: American Institute for Cancer Research, 1997.
57. Adlercreutz H, Hamalainen E, Gorbach S et al. Dietary phytoestrogens and the menopause in Japan. *Lancet* 1992; 339:1233.
58. Cassidy A, Bingham S, Carlson J et al. Biological effects of plant oestrogens in premenopausal women. *FASEB J* 1993; 7:A866.

