

WOMEN'S PSYCHOLOGICAL BEHAVIOUR IN BREAST CANCER

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Summary

Women affected by breast cancer deal with a range of psychological and medical issues. The aim of this review article is to determine the extent to which the psychological distress is associated with cancer prevention practices. The results indicate that psychological distress was directly associated with an increased likelihood of daily smoking, physical inactivity and obesity amongst physiologically distressed adults which supports the need for integration of cancer prevention and related mental health interventions to reduce specific cancer risk in severe patients. The article also includes the basic idea of cancer, its signs and symptoms, causes, the different types with their respective causes and treatments, the patient characteristics that may influence psychological outcomes for breast cancer, the predictable responses that women may have at each stage of breast cancer making note of the meaning that breast cancer may hold for those influenced.

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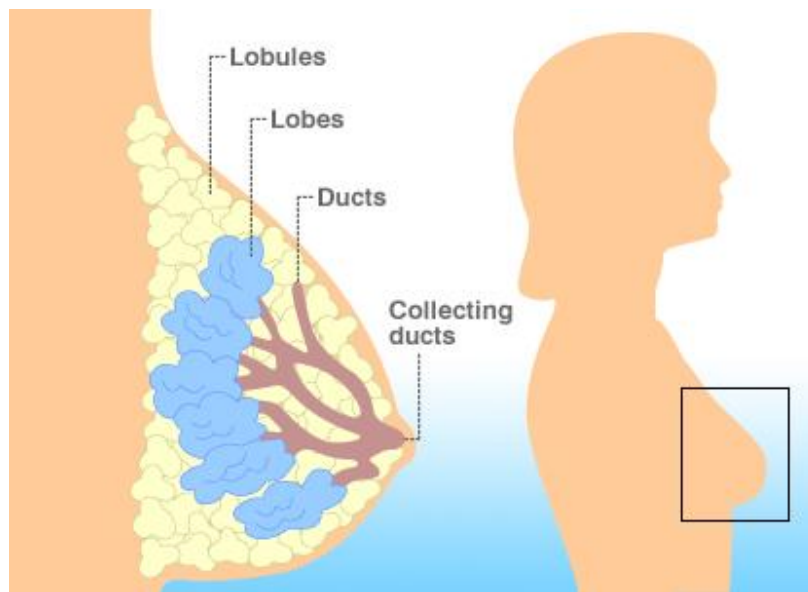
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Introduction

Breast cancer is the one of the commonest malignancies afflicting women. In some parts it is the most common malignancy. It is currently estimated that one in 14 of all female children born will develop breast cancer in their lifetime.

Cancer (medical term: malignant neoplasm) is a class of diseases in which a cell, or a group of cells display uncontrolled growth (division beyond the normal limits), invasion (intrusion on and destruction of adjacent tissues), and sometimes metastasis (spread to other locations in the body via lymph or blood). These three malignant properties of cancers differentiate them from benign tumors, which are self-limited, and do not invade or metastasize. Most cancers form a tumor but some, like leukemia, do not.¹



Cancer affects people at all ages with the risk for most types increasing with age. Common environmental factors leading to cancer death include: tobacco (25-30%), diet and obesity (30-35%), infections (15-20%), radiation, stress, lack of physical activity, environmental pollutants. These environmental factors cause abnormalities in the genetic material of cells. Genetic abnormalities found in cancer typically affect two general classes of genes. Cancer-promoting oncogenes are typically activated in cancer cells, giving those cells new properties, such as hyperactive growth and division, protection against programmed cell death, loss of respect for normal tissue boundaries, and the ability to become established in diverse tissue environments. Tumor suppressor genes are then inactivated in cancer cells, resulting in the loss of normal functions in those cells, such as accurate DNA replication, control over the cell cycle, orientation and adhesion within tissues, and interaction with protective cells of the immune system. Definitive diagnosis requires the histological examination of a biopsy specimen, although the initial indication of malignancy can be symptomatic or radiographic imaging abnormalities. Most cancers can be treated and some forced into remission, depending on the specific type, location, and stage. Once diagnosed, cancer is usually treated with a combination of surgery, chemotherapy and radiotherapy. As research develops, treatments are becoming more specific for different varieties of cancer. There has been significant progress in the development of targeted therapy drugs that act specifically on detectable molecular abnormalities in certain tumors, and which minimize damage to normal cells.²

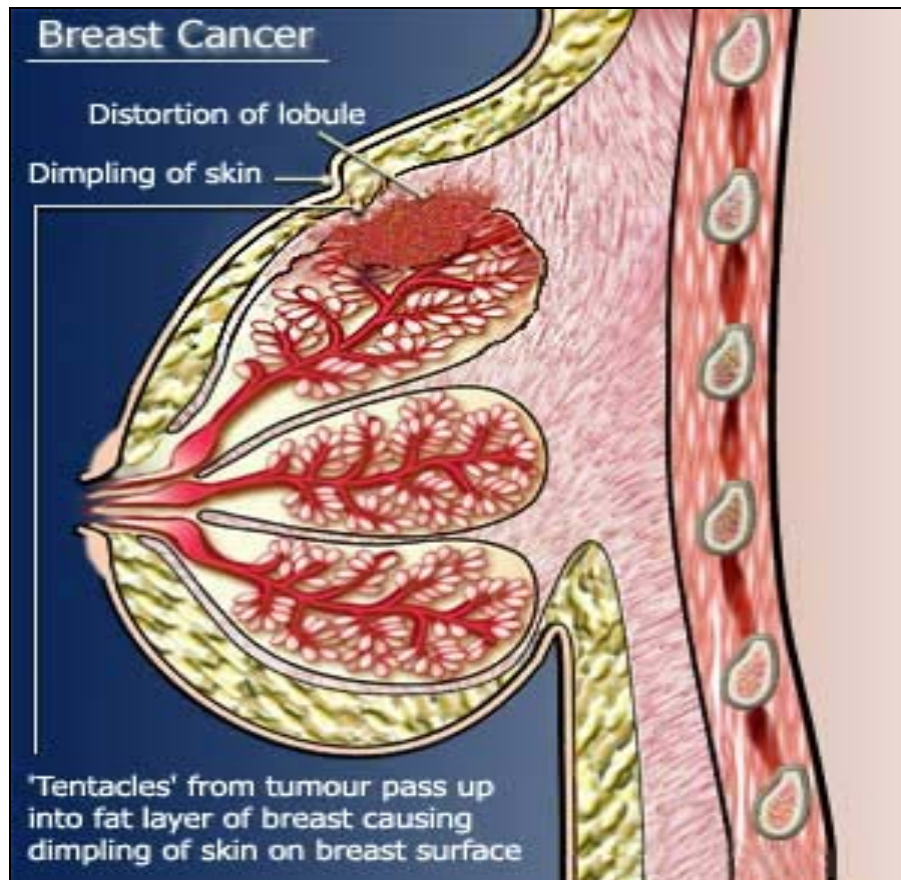


Figure 1: Breast Cancer

CAUSES

Despite extensive investigation into the cause of breast cancer there is still no known cause. However, a combination of environmental factors and genetic mutations are thought to be responsible for this cancer. In familial breast cancers, a molecular change in the genes BRCA1 and BRCA2 play a major role in the onset of the disease.

Breast Cancer Types

Breast cancer is mainly of two types:

- Ductal carcinoma- occurs in milk ducts
- Lobular carcinoma- occurs in the milk secreting breast lobules

Categorically breast cancer can also be divided into following types:

- In-situ breast cancer- cancer cells remains confined within their place of origin and do not attack surrounding breast tissue.
- Invasive or metastatic breast cancer- cancer cells break free of their place of origin, and spread to different parts of the body.

Like all cancer types, breast cancer also progresses through different stages. Breast cancer stages are based on the size of the breast lump or tumor, whether the cancer is in-situ type or malignant, and whether the cancer has spread beyond the breast tissue³.

SYMPTOMS

Following abnormalities in the breast anatomy are suggestive breast cancer symptoms⁴.

- Unusual swelling of all or one specific part of the breast
- Continuous skin irritation or dimpling
- Persisting pain in breast
- Persisting nipple pain or inversion of nipple
- Inflammation or thickening of the nipple or breast skin
- An unusual discharge from the nipple other than breast milk
- Lump in the underarm area

RISK FACTORS FOR BREAST CANCER

The exact cause of breast cancer is not known and most likely involves many factors:⁵

Geographical: It is much more common in the western world.

Gender: Women are a hundred times more likely to have breast cancer as compared to men.

Age: Breast cancer risk increases with age. 16% of women aged between 40-60 years have breast-related problems, and complain of breast lumps. In most of the cases, these breast lumps may carry a potential breast cancer risk.

Genetic: A family history of breast cancer will increase the risk of developing breast cancer in a woman by three to five times. Recently, a breast cancer gene (BR CA 1) has been identified. If a woman has this gene present in her chromosomes, there is an 85% chance of developing either breast or ovarian cancer, or both in her lifetime.

Hormonal: It appears to be more common in women who did not bear children. It is also less common in women who have their first child at early age.

Women who started their menstrual periods before age 12, those who delayed menopause until after age 55, and those who had their first pregnancy after age 30 have a mildly increased risk of developing breast cancer (less than two times the normal risk).

Fitness levels and life style related factors such as smoking are also some of the most commonly known breast cancer risk factors that can be checked.

BREAST CANCER PREVENTION

Cancer prevention though a very ambiguous concept due to their molecular cause of origin, can be achieved through small but effective changes made to lifestyle:⁶

- Restricted alcohol consumption
- Maintaining a healthy body weight
- Inclusion of limited fat in diet
- Regular exercise
- Avoiding unnecessary consumption of antibiotics
- Reverting to organic food free of pesticides

PROTECTIVE EFFECT

Pregnancy and breast feeding have a protective effect in preventing breast cancer.

DIAGNOSIS

Screening:⁷

The prognosis of breast cancer is closely related to the stage of disease at the time of diagnosis, therefore screening for breast cancer is extremely important. Numerous studies have confirmed that populations which get screened for breast cancer yield patients having much smaller tumors with much better prognosis. Currently, mammography and breast examination serve as the foundation in screening for breast cancer. Mammography is an x-ray examination of the breast. It has the ability to detect a cancer in the breast when it is quite small, long before it may be felt by breast examination. Eighty-five to 90% of all breast cancers are detectable by mammography. Approximately 10 to 15 percent of breast cancers are not visible on mammography, but can be felt on physical examination of the breast. The importance of Breast Self Examination cannot be overstressed. A percentage of breast cancers are not seen on mammography and it is extremely important for a woman to perform Breast Self Examinations. Currently, it is recommended that a woman should have a baseline mammogram between the ages of 35 and 40 years. Between 40 and 50 years of age mammograms are recommended every other year. After age 50 years, yearly mammograms are recommended at women's health care centers.

Other diagnostic tests and procedures:⁷

Ultrasound: An ultrasound is a test that uses sound waves to visualize structures inside the body. It is often used to distinguish between cysts and solid tumors in the breast. Fluid within cysts can be aspirated (withdrawn with a needle and syringe) for analysis in the laboratory.

Biopsy: It is a procedure which involves removal of a piece of tissue to analyze under the microscope. Biopsy still remains the only confirmatory test for breast cancer. If an area of the breast is suspicious for a cancer, a biopsy is usually performed to confirm or deny the diagnosis.

TREATMENT:

In recent years, there has been an overwhelming explosion of life-saving treatment advances against breast cancer. So, once breast cancer is detected, one should go for the following treatment options:⁸

- Surgery
- Radiation
- Surgery followed by Radiation
- Chemotherapy
- Combined Therapy
- Adjuvant and Neoadjuvant Therapy for Breast Cancer
- Hormonal Therapy - Aromatase Inhibitors
- Targeted Therapies
- Complimentary and Holistic Medicines
- Angiogenesis Inhibitors Therapy

BREAST CANCER AWARENESS:

A pink ribbon is universally accepted as the emblem of breast cancer awareness campaign. It denotes the struggle of the breast cancer patients. It was in 1996, when the pink and the blue ribbon were first designed to create awareness of the fact that "Men Get Breast Cancer Too!" Breast cancer can begin in different areas of the breast – the ducts, the lobules, or in some cases, the tissue in between. In this

section, you can learn about the different types of breast cancer, including non-invasive, invasive, recurrent, and metastatic breast cancers. You can also read about breast cancer in men. Cancer occurs as a result of mutations, or abnormal changes, in the genes responsible for regulating the growth of cells and keeping them healthy. The genes are in each cell's nucleus, which acts as the "control room" of each cell. Normally, the cells in our bodies replace themselves through an orderly process of cell growth: healthy new cells take over as old ones die out. But over time, mutations can "turn on" certain genes and "turn off" others in a cell. That changed cell gains the ability to keep dividing without control or order, producing more cells just like it and forming a tumor. A tumor can be benign (not dangerous to health) or malignant (has the potential to be dangerous). Benign tumors are not considered cancerous: their cells are close to normal in appearance, they grow slowly, and they do not invade nearby tissues or spread to other parts of the body. Malignant tumors are cancerous. Left unchecked, malignant cells eventually can spread beyond the original tumor to other parts of the body. The term "breast cancer" refers to a malignant tumor that has developed from cells in the breast. Usually breast cancer either begins in the cells of the lobules, which are the milk-producing glands, or the ducts, the passages that drain milk from the lobules to the nipple. Less commonly, breast cancer can begin in the stromal tissues, which include the fatty and fibrous connective tissues of the breast. Over time, cancer cells can invade nearby healthy breast tissue and make their way into the underarm lymph nodes, small organs that filter out foreign substances in the body. If cancer cells get into the lymph nodes, they then have a pathway into other parts of the body. The breast cancer's stage refers to how far the cancer cells have spread beyond the original tumor. However, only 5-10% of cancers are due to an abnormality inherited from your mother or father. About 90% of breast cancers are due to genetic abnormalities that happen as a result of the aging process and the "wear and tear" of life in general. While there are steps every person can take to help the body stay as healthy as possible (such as eating a balanced diet, not smoking, limiting alcohol, and exercising regularly), breast cancer is never anyone's fault. Feeling guilty, or telling yourself that breast cancer happened because of something you or anyone else did, is not productive.⁹

STAGES OF BREAST CANCER

- **Stage I A.** Cancer cells remain inside the breast duct, without invasion into normal adjacent breast tissue.
- **Stage I B** Cancer is 2 centimeters or less and is confined to the breast (lymph nodes are clear).
- **Stage II A.** No tumor can be found in the breast, but cancer cells are found in the axillary lymph nodes (the lymph nodes under the arm) the tumor measures 2 centimeters or smaller and has spread to the axillary lymph nodes the tumor is larger than 2 but no larger than 5 centimeters and has not spread to the axillary lymph nodes.
- **Stage II B.** The tumor is larger than 2 but no larger than 5 centimeters and has spread to the axillary lymph nodes the tumor is larger than 5 centimeters but has not spread to the axillary lymph nodes.
- **Stage III A.** No tumor is found in the breast. Cancer is found in axillary lymph nodes that are sticking together or to other structures, or cancer may be found in lymph nodes near the breastbone. Cancer has spread to the axillary lymph nodes, which are sticking together or to other structures, or cancer may be found in lymph nodes near the breastbone.
- **Stage III B.** The tumor may be any size and has spread to the chest wall and/or skin of the breast may have spread to axillary lymph nodes that are clumped together or sticking to other structures, or cancer may have spread to lymph nodes near the breastbone.

Inflammatory breast cancer is considered at least stage IIIB.

- **Stage III C.** There may either be no sign of cancer in the breast or a tumor may be any size and may have spread to the chest wall and/or the skin of the breast the cancer has spread to lymph nodes either above or below the collarbone the cancer may have spread to axillary lymph nodes or to lymph nodes near the breastbone.
- **Stage IV.** The cancer has spread or metastasized to other parts of the body.

RISK FACTORS YOU CAN CONTROL.

Weight: Being overweight is associated with increased risk of breast cancer, especially for women after menopause. Fat tissue is the body's main source of estrogen after menopause, when the ovaries stop producing the hormone. Having more fat tissue means having higher estrogen levels, which can increase breast cancer risk.

Diet: Diet is a suspected risk factor for many types of cancer, including breast cancer, but studies have yet to show for sure which types of foods increase risk. It's a good idea to restrict sources of red meat and other animal fats (including dairy fat in cheese, milk, and ice cream), because they may contain hormones, other growth factors, antibiotics, and pesticides. Some researchers believe that eating too much cholesterol and other fats are risk factors for cancer, and studies show that eating a lot of red and/or processed meats is associated with a higher risk of breast cancer. A low-fat diet rich in fruits and vegetables is generally recommended. For more information, visit our page on healthy eating to reduce cancer risk in the Nutrition section.

Exercise: Evidence is growing that exercise can reduce breast cancer risk. The American Cancer Society recommends engaging in 45-60 minutes of physical exercise 5 or more days a week.

Alcohol consumption: Studies have shown that breast cancer risk increases with the amount of alcohol a woman drinks. Alcohol can limit your liver's ability to control blood levels of the hormone estrogen, which in turn can increase risk.

Smoking: Smoking is associated with a small increase in breast cancer risk.

Exposure to estrogen: Because the female hormone estrogen stimulates breast cell growth, exposure to estrogen over long periods of time, without any breaks, can increase the risk of breast cancer. Some of these risk factors are under your control, such as:

- taking combined hormone replacement therapy (estrogen and progesterone; HRT) for several years or more, or taking estrogen alone for more than 10 years
- being overweight
- regularly drinking alcohol

Recent oral contraceptive use: Using oral contraceptives (birth control pills) appears to slightly increase a woman's risk for breast cancer, but only for a limited period of time. Women who stopped using oral contraceptives more than 10 years ago do not appear to have any increased breast cancer risk.

Stress and anxiety: There is no clear proof that stress and anxiety can increase breast cancer risk. However, anything you can do to reduce your stress and to enhance your comfort, joy, and satisfaction can have a major effect on your quality of life. So-called "mindful measures" (such as meditation, yoga, visualization exercises, and prayer) may be valuable additions to your daily or weekly routine. Some research suggests that these practices can strengthen the immune system.¹⁰

RISK FACTORS YOU CAN'T CONTROL

Gender: Being a woman is the most significant risk factor for developing breast cancer. Although men can get breast cancer, too, women's breast cells are constantly changing and growing, mainly due to the activity of the female hormones estrogen and progesterone. This activity puts them at much greater risk for breast cancer.

Age: Simply growing older is the second biggest risk factor for breast cancer. From age 30 to 39, the risk is 1 in 233, or .43%. That jumps to 1 in 27, or almost 4%, by the time you are in your 60s.

Family history of breast cancer: If you have a first-degree relative (mother, daughter, sister) who has had breast cancer, or you have multiple relatives affected by breast or ovarian cancer (especially before they turned age 50), you could be at higher risk of getting breast cancer.

Personal history of breast cancer: If you have already been diagnosed with breast cancer, your risk of developing it again, either in the same breast or the other breast, is higher than if you never had the disease.

Race: White women are slightly more likely to develop breast cancer than are African American women. Asian, Hispanic, and Native American women have a lower risk of developing and dying from breast cancer.

Radiation therapy to the chest: Having radiation therapy to the chest area as a child or young adult as treatment for another cancer significantly increases breast cancer risk. The increase in risk seems to be highest if the radiation was given while the breasts were still developing (during the teen years).

Breast cellular changes: Unusual changes in breast cells found during a breast biopsy (removal of suspicious tissue for examination under a microscope) can be a risk factor for developing breast cancer. These changes include overgrowth of cells (called hyperplasia) or abnormal (atypical) appearance.

Exposure to estrogen: Because the female hormone estrogen stimulates breast cell growth, exposure to estrogen over long periods of time, without any breaks, can increase the risk of breast cancer. Some of these risk factors are not under your control, such as:

- starting menstruation (monthly periods) at a young age (before age 12)
- going through menopause (end of monthly cycles) at a late age (after 55)
- exposure to estrogens in the environment (such as hormones in meat or pesticides such as DDT, which produce estrogen-like substances when broken down by the body)

Pregnancy and breastfeeding: Pregnancy and breastfeeding reduce the overall number of menstrual cycles in a woman's lifetime, and this appears to reduce future breast cancer risk. Women who have never had a full-term pregnancy, or had their first full-term pregnancy after age 30, have an increased risk of breast cancer. For women who do have children, breastfeeding may slightly lower their breast cancer risk, especially if they continue breastfeeding for 1 1/2 to 2 years. For many women, however, breastfeeding for this long is neither possible nor practical.

DES exposure: Women who took a medication called diethylstilbestrol (DES), used to prevent miscarriage from the 1940s through the 1960s, have a slightly increased risk of breast cancer. Women whose mothers took DES during pregnancy may have a higher risk of breast cancer as well.

Surgery is usually the first line of attack against breast cancer. This section explains the different types of breast cancer surgery. Decisions about surgery depend on many factors. You and your doctor will determine the kind of surgery that's most appropriate for you based on the stage of the cancer, the "personality" of the cancer, and what is acceptable to you in terms of your long-term peace of mind.

Chemotherapy treatment uses medicine to weaken and destroy cancer cells in the body, including cells at the original cancer site and any cancer cells that may have spread to another part of the body. Chemotherapy, often shortened to just "chemo," is a systemic therapy, which means it affects the whole body by going through the bloodstream. There are quite a few chemotherapy medicines. In many cases, a combination of two or more medicines will be used as chemotherapy treatment for breast cancer.

CHEMOTHERAPY IS USED TO TREAT

- Early-stage invasive breast cancer to get rid of any cancer cells that may be left behind after surgery and to reduce the risk of the cancer coming back
- Advanced-stage breast cancer to destroy or damage the cancer cells as much as possible

In some cases, chemotherapy is given before surgery to shrink the cancer. Radiation therapy also called radiotherapy is a highly targeted, highly effective way to destroy cancer cells in the breast that may stick around after surgery. Radiation can reduce the risk of breast cancer recurrence by about 70%. Despite what many people fear, radiation therapy is relatively easy to tolerate and its side effects are limited to the treated area. Your radiation treatments will be overseen by a radiation oncologist, a cancer doctor who specializes in radiation therapy.¹⁰

HORMONAL THERAPY

Hormonal (anti-estrogen) therapy works against hormone-receptor-positive breast cancer. It is completely different from hormone replacement therapy (HRT), which some women take during or following menopause. HRT is not a breast cancer treatment, and for women with a breast cancer diagnosis, HRT is considered relatively unsafe.

Hormonal therapy medicines treat hormone-receptor-positive breast cancers in two ways:

- by lowering the amount of the hormone estrogen in the body
- by blocking the action of estrogen on breast cancer cells

Most of the estrogen in women's bodies is made by the ovaries. Estrogen makes hormone-receptor-positive breast cancers grow. So reducing the amount of estrogen or blocking its action can reduce the risk of early-stage hormone-receptor-positive breast cancers coming back (recurring) after surgery. Hormonal therapy medicines can also be used to help shrink or slow the growth of advanced-stage or metastatic hormone-receptor-positive breast cancers. Hormonal therapy medicines are NOT effective against hormone-receptor-negative breast cancers. There are several types of hormonal therapy medicines, including aromatase inhibitors, selective estrogen receptor modulators, and estrogen receptor downregulators. In some cases, the ovaries and fallopian tubes may be surgically removed to treat hormone-receptor-positive breast cancer or as a preventive measure for women at very high risk of breast cancer. The ovaries also may be shut down temporarily using medication. It's important to know that hormonal therapy is NOT hormone replacement therapy (HRT). HRT isn't used to treat breast cancer. HRT is taken by some women to treat troublesome menopausal side effects such as hot flashes and mood swings. HRT is used to raise estrogen levels that drop after menopause. HRT contains estrogen and can contain progesterone and other hormones. Hormonal therapy is exactly the opposite it blocks or lowers estrogen levels in the body. Targeted cancer therapies are treatments that target specific characteristics of cancer cells, such as a protein that allows the cancer cells to grow in a rapid or abnormal way. Targeted therapies are generally less likely than chemotherapy to harm normal, healthy cells. Some targeted therapies are antibodies that work like the antibodies made naturally by our immune systems. These types of targeted therapies are sometimes called immune targeted therapies. Breast cancer represents an important concern for women, especially for those in industrialized countries. The disease is the second to lung cancer as a cause of cancer death. According to the American Cancer Society one in eight US women may develop this cancer during her lifetime. The age-standardized morbidity of women for breast cancer is 38.7 per 100,000 in Poland. There are several established risk factors for this disease (e.g., a family history of breast cancer, menarche before age 11, menopause after age 54, null parity or late age at first pregnancy, increased consumption of alcohol, obesity (only among post-menopausal women), but majority of them are not easily modifiable. Physical activity is one of the few known modifiable factors and increased physical exercise may play a key role in primary prevention against breast cancer.¹¹

FERTILITY ISSUES

Very young women are more likely to have concerns related to the effect of chemotherapy and endocrine therapy on their fertility. Chemotherapy is cytotoxic to the ovaries and a proportion of premenopausal women having chemotherapy for early breast cancer will develop menstrual abnormalities and premature menopause. The histological effect of cytotoxic chemotherapy is a progressive, permanent, dose-related depletion of primordial follicles with ovarian fibrosis and atrophy. Increasing age is significantly correlated with increasing ovarian failure rate. The risk of ovarian failure is also related to the chemotherapeutic agent and the cumulative dose. Alkylating agents (e.g. cyclophosphamide) appear to be the most gonadotoxic, but there is limited information about the newer agents such as the taxanes. Young women require higher cumulative doses of chemotherapy to develop gonadal failure. Most of the data pertaining to the likelihood of becoming amenorrhoeic with adjuvant chemotherapy for early breast cancer comes from women having CMF and these results may not be directly comparable to anthracycline based chemotherapy regimens. Menstruating compared with 33% of patients aged 30–39 years and 96% of those aged 40–49 years. In young women, chemotherapy-related amenorrhea may be reversible in 22–56%. For patients with tumors to permanent menopause over reversible hormonal manipulations. Current options for women embarking on adjuvant chemotherapy in which preservation of fertility is desirable are limited. Women have the option of undergoing a cycle of ovarian hyperstimulation and egg harvest, but there are theoretical concerns about the safety of ovarian hyperstimulation in the breast cancer setting. The possibility of ovarian cryopreservation awaits clinical progress in in-vitro maturation of thawed primordial follicles, their in vitro fertilization and embryo transfer. There has been some interest in attempting to minimize the gonadotoxic effect of chemotherapy by the co-treatment with a gonadotropin-releasing hormone (GnRH) agonist analogue to induce a temporary prepubertal\ hormonal.¹²

PSYCHOSOCIAL ISSUES

A diagnosis of breast cancer is obviously a stressful life-event for a woman at any age, but younger women are likely to face unique concerns and studies have shown them to be particularly vulnerable. Young women more frequently have concerns about the impact of the diagnosis on their partner and may have practical issues related to the care of young children during their treatment. Research suggests that peer support and self help groups decrease feelings of social isolation, depression and anxiety. The development of specific support groups to deal with the unique issues related to breast cancer in adolescents and very young women is difficult due to the rarity of this condition. Young age of onset of disease has been identified as a risk factor predicting adverse psychological outcomes. Very young women are especially vulnerable to psychological distress related to body image and sexuality. Loss of fertility may also be the source of psychological distress in young patients. Between 10% and 50% of women experience sexual problems following the diagnosis and treatment of breast cancer. Adjuvant chemotherapy and endocrine therapy may affect sexual response and the induction of premature menopause may produce atrophic vaginitis. Physicians should be aware that these young patients have an increased risk of psychological problems and refer patients early for counselling.

THE TARGETED THERAPIES USE TO TREAT BREAST CANCER^{13, 14}

Herceptin: Herceptin (chemical name: trastuzumab) works against HER2-positive breast cancers by blocking the ability of the cancer cells to receive chemical signals that tell the cells to grow.

Tykerb: Tykerb (chemical name: lapatinib) works against HER2-positive breast cancers by blocking certain proteins that can cause uncontrolled cell growth.

Avastin: Avastin (chemical name: bevacizumab) works by blocking the growth of new blood vessels that cancer cells depend on to grow and function.

Fluorouracil (also called 5-fluorouracil or 5-FU; brand name: Adrucil)

Methotrexate (brand names: Amethopterin, Mexate, Folex)

Tamoxifen (brand names: Nolvadex, Apo-Tamox, Tamofen, Tamone)

Vincristine (brand names: Oncovin, Vincasar PES, Vincrex)

Conclusions

Attention to the psychological costs of screening has lagged far behind the technical and organizational aspects of the screening services. There are signs of greater interest, but particularly from those who are most critical of the whole ethos of screening, and consequently consideration of the psychological impact has been linked with doubts about the value of screening programmes. This connection is not appropriate but it may serve to stimulate research on the psychological costs of screening, both to find out how serious costs are, and to explore methods of minimizing them. The limited empirical literature on the psychological impact of screening has left many uncertainties. Interviews with women who have abnormal findings on screening have suggested a substantial toll of emotional turmoil, but they have been uncontrolled and essentially subjective evaluations. Studies which have used questionnaires to provide more objective indices of emotional response have typically detected only a limited and transient impact, but may be insensitive to more subtle concerns. The important issues to address in future research are not simply whether the psychological costs of screening outweigh the benefits, but what the psychological costs are and which groups are most vulnerable. The issues of how screening information might best be presented and when anxiety can promote sensible preventive behaviours as opposed to distress and avoidance are also vital. Finally, it would seem desirable to establish methods whereby the concerns of screening participants might be monitored in routine care. Attention to these psychosocial aspects of screening should help to ensure that the psychological burden of cancer screening is both properly evaluated and effectively minimized, and that the balancing of costs on benefits can be put on a more objective basis.

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