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Risk Factor Assessment of Patient with Breast Cancer

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Abstract: *Cancer results from a series of molecular events that fundamentally alter the normal properties of cells. They are abnormal cells in which the tactics regulating normal cell division are disrupted. Breast cancers are the most frequent female cancer, the 2nd most common cause of cancer death in women. Over a million new cases of breast cancer are identified every year. Both mortality and burden are high. Due to the lack of information basic knowledge about cancer, negative fitness facilities, and terrible get entry to treatment, late screening and detection. Various phenomena serve as shielding as properly as chance factors for breast cancer. Several traits proving to be chance elements include Age and gender, Genetic predisposition and family history, Alcohol consumption and smoking, Hormone Replacement Therapy and Oral Contraceptives., Physical Activity, Obesity and Over Weight, Breast density and Breastfeeding ,Radiation, Endogenous hormone levels, menstrual cycles are at notably the multiplied threat of breast cancer. This paper offers a review on breast cancer, pathogenesis, risk factors and clinical presentation of breast cancer.*

Key Words: *Breast cancer, Pathogenesis, Risk factor and Clinical presentation.*

1. INTRODUCTION:

Cancer is a world-wide public health trouble affecting all classes of persons. It is amongst the predominant worldwide health issues, with an estimated 10 million incidences and 6 million annual death rates [1]. Globally, breast cancer is the most common cancer among women, representing the second cause of death in this population. According to a World Health Organization estimate, 410 712 women die annually from this case worldwide, and there are a total of 1,151 298 new cases per year [2].Breast cancer is a type of cancer that originates from tissues of the breast both from the internal lining of milk ducts or the lobules that supply the ducts with milk. Two principal types of breast cancer usually exist: lobular carcinoma and ductal carcinoma. Breast cancer may additionally begin in different areas of the breast, but that is rare. Therefore, occasionally it might also additionally be classified as invasive or non-invasive [3].

The Risk factors for breast cancer include gender and age, Genetic Predisposition and Family History, Breast density and breastfeeding, Smoking and Alcohol Consumption, exposure to radiation, Hormone Replacement Therapy and Oral Contraceptives and obesity, Endogenous hormonal level and menstrual cycle. Alcohol Consumption seems to expand the risk of breast cancer. In those who are long-term drunks, the risk is elevated 7% to 10%. Oral contraceptives may represent a predisposing thing for the development of premenopausal breast cancer. The breast cancer risk is 7-13% greater in modern-day smokers, and 6-9% higher in former smokers, in constructing with non-smokers [4].

2. OBJECTIVE OF THE REVIEW:

The objectives of this review are:-

- To study the association between breast cancer and exposure variables.
- To assess / identify risk factor for breast cancer.
- To increase awareness of breast cancer for public

3. METHODS:

Relevant studies from (2001-2017) has been searched using from different literature review and published study journal such as; America cancer society research, world cancer research, world journal of clinical oncology, world health organization, cancer research UK and different study journals. In general, It was observed 14 reviews and 26 study journal, 89 references from 2001-2017 years used it.

The study method has been included; case -control study, a prospective observational study and comparative studies. Majority studies were performed by using of case-control study design method and in this study, risk factors for breast cancer were evaluated among women with breast cancer and apparently healthy women (as controls). The majority of patients were at the age above 40 years and the risk factor breast cancer are conducted on age and gender, alcohol consumption, genetic predisposition, hormone replacement, breast feeding, and radiation as well as physical activity.

4. LITERATURE REVIEW:

A. Breast Cancer and Etiology

Breast cancer is a disease in which malignant (cancer) cells structure in the tissues of the breast. It occurs in both sexes. However, very uncommon in men. Breast cancer is the most common cause of cancer death among women in 140 of 184 countries globally and the most frequently diagnosed cancer among female which now represents one in four of all cancers in girls[2].

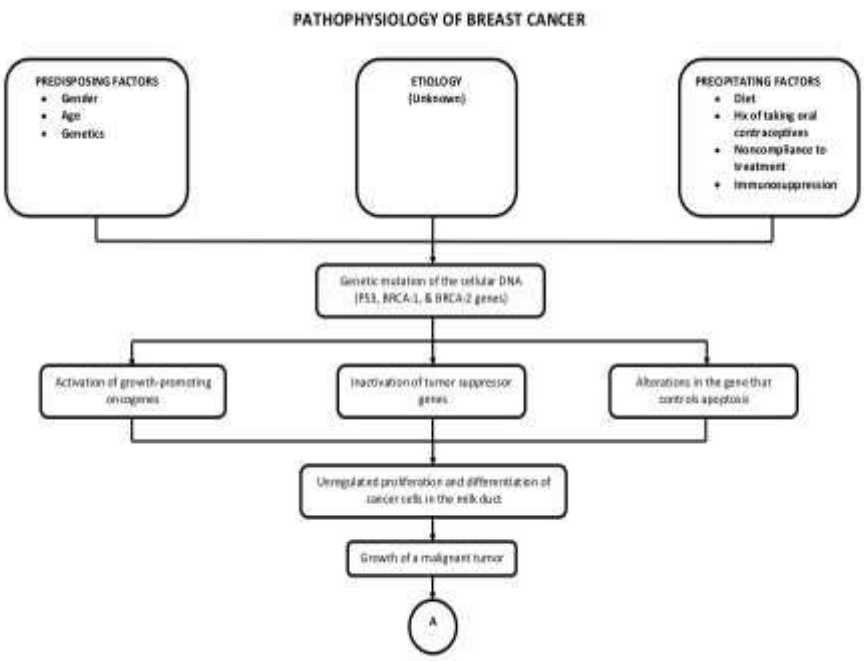
Breast cancer is a type of cancer that originates from tissues of the breast — either from the inner lining of milk ducts or the lobules that supply the ducts with milk. Two main kinds of breast cancer commonly exist: lobular carcinoma and ductal carcinoma. Breast cancer might also additionally being in other areas of the breast, but that is uncommon. Therefore, sometimes it may also additionally be categorized as invasive or non-invasive. Non-invasive breast cancer is called carcinoma in situ [5].

A lump exclusive from the rest of the breast tissue is felt as the first noticeable symptom of breast cancer. Other symptoms encompass dimpling of the skin, spontaneous single-nipple discharge, and inversion of the nipple or exchange in the size or structure of the breast. Pain of the breast, normally referred to as mastodynia, can also be indicative of any breast health issue, and is now not viewed to be a reliable device to decide the presence or absence of breast cancer. Symptoms greater particular to invasive breast cancer include: Irritated or itchy breasts, Change in breast color, Increase in breast size or shape (over a short period of time), Changes in contact (may feel hard, soft or warm) Peeling or flaking of the nipple skin, A breast lump or thickening, Redness or pitting of the breast pores and skin (like the skin of an orange)[6].

The etiology of breast cancer is not fully understood [2].A variety of interrelated factors, such as genetics, hormones, the environment, sociobiology and physiology among others can influence breast cancer development.

B. Pathogenesis of Breast Cancer

Breast cancer usually happens due to the interaction between environmental and genetic factors. PI3K/AKT pathway and RAS/MEK/ERK pathway protect regular cells from cell suicide. When the genes encoding these defensive pathways are mutated, the cells become incapable of committing suicide when they are no longer needed which then leads to cancer development. These mutations had been verified to be experimentally linked to estrogen exposure [7]. It was once advised that abnormalities in the growth factors signaling can facilitate malignant cell growth. Over expression of leptinin breast adipose tissue leads to increased cell proliferation and cancer. The familial tendency to enhance breast cancers is called hereditary breast–ovarian cancer syndrome. Some mutations related to cancer, such as p53**,** BRCA1 and BRCA2; occur in mechanisms to correct errors in DNA, leading to uncontrolled division, lack of attachment, and metastasis to distant organs. The inherited mutation in the BRCA1 or BRCA2 genes can interfere with repair of DNA cross links and DNA double strand breaks.GATA-3 directly controls the expression of estrogen receptor (ER) and different genes associated with epithelial differentiation. Loss of GATA-3 leads to inhibition of differentiation and bad prognosis due to extended cancer cell invasion and distant metastasis [8].



C. Risk Factor of Breast Cancer

Age and Gender

Besides sex, aging is one of the most important risk factors of breast cancer, due to the fact incidence of breast cancer is rather related to the increasing age. In 2016, approximately 99.3% and 71.2% of all breast cancer-associated deaths in America had been said in women over the age of 40 and 60, respectively[9].Therefore, it is necessary to have a mammography screening beforehand of time in female aged fourty or older.

According to [10] statistics, the risk of a breast cancer analysis will increase with age that estimated 83% of new breast cancer cases will appear in females over the age of 50 years old in 2016. As we can see from the below graphs, new breast cancer cases are highest between the ages of 60 and 69 years old. Indeed, 27% of all new breast cancer cases were women between 60 and 69 years old. However, the rates in general are highest between the ages of 50 and 69 years and this age team represents 51% of all new cases. In younger women, only 17% of new breast cancer cases will be identified with female below the age of 50 years. Furthermore, 13% of these new cases take place between the ages of 40 and 49 years.

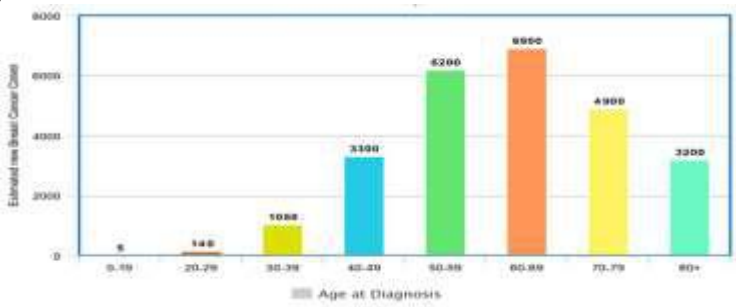


Figure 1: Estimated new breast cancer cases

Smoking and Alcohol Consumption

The breast cancer risk is 7-13% greater in modern-day smokers, and 6-9% higher in former smokers, in constructing with non-smokers. Breast cancer risk will increase with years on account that starting smoking prior to first giving birth in ever smokers compared with never smokers. The impact of smoking may also be confined to non-obese women [11].

The breast cancer risk is 4% higher in women who consume up to 12.5g of alcohol per day, 23% greater in women who consume around 12.5-50g of alcohol per day, and 60% higher in women who consume 50g of alcohol per day, compared with non-drinkers [12].The breast cancer risk among BRCA1/2 mutation carriers is not associated with alcohol intake. Alcohol consumption is related to higher ranges of sex hormones, which may partly explain the link between alcohol and breast cancer risk [13].

Genetic Predisposition and Family History

Genetic predisposition Inherited mutations (genetic alterations) in BRCA1 and BRCA2, the most well-studied breast cancer susceptibility genes, account for 5%-10% of all women breast cancers, 5%-20% of male breast cancer, and 15%-20% of all familial breast cancers [14].Less than 10% of all breast cancers (BC) cases is caused by a genetic predisposition, most commonly due to a mutation in one of the BRCA -genes. women BRCA1/2-mutation carriers have a cumulative lifetime risk of BC up to 60–80%, and an increased risk of ovarian cancer (OC) up to 20–60% for BRCA1 and 5–20% for BRCA2.

Women and men with a family history of breast cancer, in particular in a first-degree relative (parent, child, or sibling), are at elevated risk for the disease. Compared to women without a family history, risk of breast cancer is about 2 times greater for women with one affected first-degree girl relative and 3-4 times higher for female with more than one first-degree relative. A family history of ovarian cancer is can be also related to increased breast cancer risk in both men and women [15].

Breast density and Breastfeeding

Breast tissue density is a mammography indicator the amount of glandular and connective tissue relative to fatty tissue. Compared to women with 11%-25% breast density, those with 26%-50% or 50% or higher breast density have about a 1.6 or 2.3 times, respectively, higher risk of breast cancer [16].Breast density is influenced by way of genetics, but commonly decreases with age, pregnancy, menopause, and higher body weight. Some drugs also have an effect on breast density, consisting of tamoxifen (decreases density) and mixed menopausal hormone therapy (increases density).Mammography detection of breast cancer is impaired in areas of dense breast tissue [17].

Most research suggests that breastfeeding for a year or more slightly reduces a woman's overall risk of breast cancer, with longer duration associated with greater risk reduction. In a review of 47 researches in 30 countries, the risk

of breast cancer was a decrease of 4% for every 12 months of breastfeeding. One possible explanation for this effect may also be that breastfeeding inhibits menstruation, thus reducing the lifetime number of menstrual cycles [18].

Hormone Replacement Therapy and Oral Contraceptives.

Hormone replacement treatment (HRT) contains synthetic sex hormones, which might also an explanation for the hyperlink between HRT use and breast cancer risk. 2% of breast cancer cases in the UK are caused by Hormone replacement treatment. The breast cancer risk is 55-100% increases in oestrogen- progestogen HRT (combined HRT) current users versus never users, cohort research have proven[19].

Less than 1% of breast cancer cases in the UK are by oral contraceptives. OCs consists of artificial intercourse hormones, which can also supply an explanation for the link between OC use and breast cancer risk. However, breast cancers in OC users tend to be much less superior in contrast with those in OC never-users. The relative risk of breast cancer declines after OC cessation**,** such those 10 years after cessation no excess risk remains. Breast cancer risk does not exhibit up to expand with longer periods of OC use [20].

The risk associated to OC use looks to be comparable at some stage in OC formulations (which have modified significantly over time), household, BRCA carrier status (though some proof of no association with OC use in BRCA1/2 mutation carriers), and ethnicity[21].

Physical Activity, Obesity and Over Weight

Consistent bodily recreation has been proven to limit the risk of breast cancer in a dose established manner, with modest exercise conferring a 2% limit in risk and vigorous activity a 5% reduce in risk. Women who get ordinary physical recreation have a 10%-20% decrease risk of breast cancer in contrast to females who are inactive. The protective impact is impartial of BMI and can also be limited to women who have never used menopausal hormone treatment. A higher reduction in risk is related to increasing amounts of exercise and more vigorous activity; however, even smaller amounts of exercise, which includes walking, show up beneficial. More than 73,000 postmenopausal women found that breast cancer risk was 14% lower amongst female who reported walking 7 or extra hours per week compared to women who walked three or much less hours per week[22].

Radiation

Radiation exposure from various sources, including medical treatment and nuclear explosion will increase the risk of breast cancer. Radiation to the chest wall for treatment of childhood most cancers will increase the risk of breast cancer linearly with chest radiation dose. Survivors of childhood cancers who acquired therapeutic radiation are at a dose dependent risk for the improvement of breast cancer, and those treated for Hodgkin's disease are at best possible risk (RR = 7). Radiation outcomes in the development of female breast cancer have additional been established in Japan submit nuclear attack on Hiroshima and Nagasaki and positively correlate with age youthful than 35 years at the time of exposure. The incidence of breast cancer additionally accelerated in areas of Belarus and Ukraine. A significant two fold extend used to be viewed in the most contaminated areas around Chernobyl following the nuclear accident and take place in females who were youthful at the time of the exposure[23].

Endogenous hormone levels

Postmenopausal female with naturally excessive degrees of certain endogenous sex hormones have about twice the risk of growing breast cancer compared to girls with the lowest levels [24].

High circulating hormone ranges are associated with and may additionally reflect the outcomes of other breast cancer risk factors, such as postmenopausal obesity and alcohol use. It is harder to study the relationship of hormones in premenopausal female because ranges differ across the menstrual cycle; however, a recent large review found that high levels of circulating estrogens and androgens are also related with a small elevated risk of breast cancer in premenopausal females [25].

Menstrual cycles

Breast cancer risk increases slightly for each year before hand menstruation starts (by about 5%) and for each year later menopause begins (by about 3%).Breast cancer risk is about 20% greater among women that commence menstruating earlier than age 11 compared to those that start at age 13. Likewise, girls who experience menopause at age 55 or older have about a 12% greater risk in contrast to those who do so between ages 50-54 .The increased risk may be due to longer lifetime exposure to reproductive hormones and has been extra strongly linked to ER+ breast cancer than other subtypes[26].

C. Clinical Presentation of Breast Cancer

The first presentation of breast cancer is generally a lump that is unique from the rest of the breast tissue. Other presentations include thickening uniqueness of the different breast tissue, one breast turning into larger or lower, change

in the position or shape of the nipples, pore and skin dimpling, nipple discharge, constant pain in part of the breast or armpit or swelling under the armpit. Inflammatory breast cancer is a specific kind of breast cancer that commonly gives with itching, pain, swelling, nipple inversion, warmth and redness during the breast, as well as an orange-peel texture to the pores and skin referred to as peaud' orange. Paget's sickness of the breast is some other different form of breast cancer that normally affords with redness, discoloration, or mild flaking of the nipple skin. Then, tingling, itching, increased sensitivity, burning pain and discharge from the nipple show up [27]. Phyllodes tumors are hard, movable non-cancerous lumps formed inside the stream of the breast and contain glandular as well as stromal tissue. They are categorized on the foundation of their look underneath the microscope as benign, borderline or malignant. Occasionally, breast cancer may additionally present as metastatic disease. Common sites of metastasis consist of bone, liver, lung and brain. Symptoms depend on the site of metastasis and consist of unexplained weight loss, fever, chills, bone pains, jaundice or neurological signs and symptoms [28].

5. CONCLUSION AND RECOMMENDATION:

Breast cancer is a disease in which malignant (cancer) cells form in the tissues of the breast. It occurs in both sexes, but very rare in men. Breast cancer is a type of cancer that originates from tissues of the breast either from the inner lining of the milk ducts or the lobules that supply the ducts with milk. Breast tissue varies at different stages of life in response to host hormonal status and other environmental influences. Early detection of breast cancer can play a significant role in reducing its incidence and burden. Breast cancer mortality can be reduced if cases were detected and treated early. Although the presence or absence of risk factors is not a confirmation for the establishment of cancer or not in an individual, modifying some of the risk factors is crucial in the prevention of breast and other forms of cancer. It is therefore possible that some risk factors will have different consequences at unique lifestyle stages.

The risk factors for breast cancer include Gender and age, lack of childbearing or lack of breastfeeding, Smoking and Alcohol Consumption, Hormone Replacement Therapy and Oral Contraceptives, Genetic Predisposition and Family History, certain dietary patterns, exposure to radiation of breast cancer and obesity. Tobacco seriously damages our health, and there is every reason to avoid its intake in any form. Both frequent and high consumption of alcohol should be stopped or significantly reduced. Increased consumption of fatty foods should be replaced with increase intake of fruits, vegetables and fish. Above all, eating a healthy diet and a happy lifestyle may reduce the risk of developing the malignancy. Frequent exercise or moderate physical activities are essential to preventing breast cancer and other diseases.

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