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Shedding Light on Breast Cancer, its Development, And Methods of Diagnosis and Prevention

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تسليط الضوء على سرطان الثدي وتطوره وطرق التشخيص والوقاية

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ABSTRACT

It is a complex task to find out a specific reason of breast cancer which are based on multiple factors. Nevertheless, hormones, especially estrogens, are the ones that are mostly responsible for hampering unrestricted division of cancerous cells in the mammary gland. Fully knowing their role is pivotal for matching preventive and therapeutic plans. Chromosomal anomalies are abundant in this inborn module but they are next to BRCA1 and BRCA2, the errors that increase the risk. The diagnostic technologies which include HER2/neu testing and gene expression profiling are made to personalize the therapy practice with the intention to enhance the outcomes. The amalgam of environmental, hormonal, and genetic influences results in the creation of an individuality. The effectiveness of rehabilitation can be drastically boosted through the early identification of a disease process. A mammogram, the top screening tool for breast cancer built-in, can spot a cancer even before it shows any symptoms. In the matter of particles the breast cancer treatment has been changed greatly. Distressed tablets like trastuzumab and aromatase inhibitors in the event when accompanied by traditional chemotherapy, which in return produce efficacy with lesser side effects. Preventative policies encompass the realization of lifestyle changes as well as medical intervention. Maintaining a healthy weight, doing some extra movements, and limiting alcohol intake are all good examples of what you can do to reduce your chances of complications. Successful chemoprevention among high-risk subjects, via drugs like raloxifene and tamoxifene, has been founded. Immunotherapy is a novel approach of curing cancer by triggering immune response of the body.A review of its mechanism of operation, and preventive measures. The precision of staging is improved because of other supplementary information that is available in additional techniques like MRI and ultrasound. Such individuals can be candidates for preventive procedures such as oophorectomy or mastectomy.

Key words: Breast Cancer Gene1., Breast Cancer Gene2, Human Epidermal Growth Factor Receptor2, Magnetic resonance imaging (MRI), .

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HISTORY OF B.C.:

Breast cancer is categorized by abandoned growth of malignant cells in the mammary epithelial tissue. The disease disturbs both genders. Breast cancer is the most everyday type of cancer in women worldwide, with an frequency that rises histrionically with age. Breast cancer reportedly accounted for 29% of all new cancer cases and 14% of all cancer-related deaths among women worldwide up to 2012 [1]. Breast cancer in the 21st century is therefore not necessarily terminal. Better therapeutic options and major improvements in public health and care have resulted in a dramatic reduction in mortality and a major increase in longevity. Breast cancer is rare in males, comprising 1% of all breast cancer diagnoses in the United States and less than 0.1% of cancer-related deaths in men .This translates into about 1.7 million new cases in women and an estimated 522, 000 deaths in 2012 . As alarming as it may seem, the mortality to incidence ratio for breast cancer is around 0.31, which is far more favorable than pancreas and liver cancers, with ratios of 0.98 and 0.95, respectively [2,3].

Since 1999, incidence rates of breast cancer have stabilized among women aged 50 or over, which may reflect trends in mammography screening rates. Epidemiological data from the United States show that breast cancer death rates were stable from 1980 to 1989 for women aged 20 to 64 and increased for women aged 65 and over. In most countries, however, breast cancer incidence rates are increasing, including in countries with historically higher rates, such as those in Europe, as well as regions with historically lower incidence rates like many countries in Latin America, Asia, and Africa . This rise is generally due to changes in reproductive patterns such as age at menarche, age at first pregnancy, number of births, and duration of breastfeeding [4].

Signs and symptoms

Skin irregularities such as redness, dimpling, or pitting that are developing into an orange peel may be an early sign of a health problem. Moreover, unattended changes in the position of the nipples or breast milk components except by other means, must be brought to attention. One should always keep in mind that these things can be caused by other health conditions rather than breast cancer and they will prompt an appointment with the health professional in case of any doubt. Women become happier as they are aware that they have to check any breast changes sooner. Although breast cancer is linked mostly to women, this disease can be developed among men too. A man should guard against any abnormal growth of tissues or swelling in the breast. Besides the changes in size or shape of the caves, one can also observe different forms of entrances. in the fight against breast cancer they do play a significant role however being symptomless should not be a reason for assuming that you don't have cancer. Screening from time to time, practicing an overall healthy lifestyle and being aware of the family history and other risk factors will help prevent and treat the diseases. Breast cancer commonly manifests as changes in the breast tissue, skin, or nipple. The presence of a lump or simply the feeling of deepening in the breast or underarm which could be effortless but at times accompanied with tenderness may indicate one is experiencing breast cancer. This may show up as a discernible pain or uneasiness in the breast but not all cases suffer pain.[5,6].

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Risk factors

Studies have revealed that exercise on a regular basis can be helpful to certain of these hazards. In addition, a suspicion of a robust familial history of breast cancer may increase risk especially if close relatives were diagnosed at their early age. Inherited genetic changes in genese like BRCA1 and BRCA2 apart from other genes cause an increase in the likelihood. Although the previous history of breast cancer or peacific breast states increases the risk, the beginning of menarche and the maturity might overlap in a change of the breast tissue. Existing variables which are contributors to more chance of breast cancer are the gender as women are more susceptible to it than men and the age factor coming into play with most people aged 50 and above contracting the disease. The time of chest radiation exposure, especially when it occurs in childhood and adolescence, is another risk factor. Another risk group will be the women with high density breast tissue, those who regularly consume alcohol and lead sedentary lifestyle, which can contribute to the growth of obesity, experienced by the society as a whole.[6].

Hormone treatment and hormonal contraception

which can petroleum the growth of types of breast tumors [7].

Period of Treatment:spread for 5-9years, dependent on the schedule and patient factors.Ancillary and Neoadjuvant Settings:Ancillary hormone treatment is absorbed after operation to decrease the risk of return.Neoadjuvant hormone treatment is given before surgery to shrink tumors., Mark Population:Hormone receptors for breast cancer seem in the presence of estrogen, progesterone receptors .,Kinds of Hormone Treatment: (SERMs): Tamoxifen is a commonly used SERM that hunks estrogen receptors.Aromatase Inhibitors (AIs): Monitoring and Follow-Up:the monitor of side properties and episodic valuations to appraise action effectiveness and adjust rehabilitation as needed. .Findings:Numerous studies have traveled the affiliation between hormonal contraception and breast cancer, with mixed findings.Current evidence proposes a slightly amplified risk of breast cancer related with hormonal contraception, particularly among current and recent users. Risk worries about its possible suggestion with breast cancer have been a subject of research and discussion. personalized discussions and appraisals between patients and healthcare professionals are crucial. It's vigorous for women to involve in discussions with healthcare workers apropos their discrete risk factors and medical antiquities. Given the composite and embryonic considerate of the link between hormonal contraception and breast cancer risk. [8].

Genetics of Breast Cancer : [9].

Environmental and genetic variables both raise the risk of breast cancer, inherited gene mutations are assumed to be the primary cause of most occurrences. BRCA1 and BRCA2 are two key genes linked to hereditary breast cancer.These genes' mutations raise the chance of getting breast and ovarian cancer.investigates important aspects of the genetics of breast cancer, such as specific genes, genetic variables, and developments in genetic research. Due to the autosomal dominant inheritance pattern of these mutations, an individual with a single mutant copy of the gene is at a higher risk of getting cancer.On chromosome 13, BRCA2 is a gene that codes for a tumor suppressor protein that aids in DNA repair. Breast, ovarian, prostate, and pancreatic cancers are all more common in those with BRCA2 mutations

Breast cancer is influenced by a number of risk factors, such as age, gender, family history, hormonal variables, and lifestyle decisions.Cell growth in breast tissue is a defining feature of the complex

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illness known as breast cancer. Numerous genetic, environmental, and behavioral variables are involved in the complicated topic of breast cancer genetics. Due to the autosomal dominant inheritance pattern of these mutations, an individual with a single mutant copy of the gene is at a higher risk of getting cancer.. Mutations in BRCA2 are inherited in an autosomal dominant manner, just like BRCA1 mutations.Additional Genetic Elements.Genetically Caused Breast Cancer Five to ten percent of instances of breast cancer are thought to be hereditary, which means that certain inherited genetic abnormalities cause the disease. To determine mutations in high-risk genes, genetic testing is available, enabling people to evaluate their genetic.Due to the autosomal dominant inheritance pattern of these mutations, an individual with a single mutant copy of the gene is at a higher risk of getting cancer.On chromosome 13, BRCA2 is a gene that codes for a tumor suppressor protein that aids in DNA repair. Breast, ovarian, prostate, and pancreatic cancers are all more common in those with BRCA2 mutations. Mutations in BRCA2 are inherited in an autosomal dominant manner, just like BRCA1 mutations.Additional Genetic Elements. Although very important, BRCA1 and BRCA2 only make up a small portion of the genetic makeup of breast cancer. Some other genes are associated with a higher risk of breast cancer, but with a lower penetrance. These include ATM, PALB2, CHEK2, and TP53.Analysis of Genetics A person's DNA is analyzed using processenetic testing to search for certain mutations linked to a higher risk of breast cancer. This method allows people to make informed decisions about heightened surveillance, preventative actions, or lifestyle modifications.Developments in the Field of Genetics The study of the genetics of breast cancer has advanced significantly in the last few years. Breast cancer diagnosis and treatment are changing as a result of the discovery of new susceptibility genes, advances in our knowledge of gene interactions, and the creation of more specialized drugs.Personalized medical care: Considering our growing.

pathophysiology: [10].

Beginning and Genetic Elements: The development of breast cancer often begins with genetic alterations that disrupt the typical regulatory mechanisms controlling cell proliferation. As was previously noted, the risk of developing breast cancer may be increased by hereditary mutations. Acquired mutations resulting from exposure to carcinogens or from unintentional errors in DNA replication are also significant. Subtypes with positive hormone receptors: A and B luminaries. HER2/neu overexpresses when a person is HER2-positive. Triple-negative: lacks expression of hormone receptors and HER2. Each subtype is unique and may respond differently to treatment. The accumulation of genetic changes upsets the normal balance between cell division and cell death, resulting in tumor development and cell proliferation. Tumors are caused by aberrant cells that proliferate uncontrollably.

Carcinoma in situ refers to a tumor that is limited to the ducts or lobules and does not spread to the surrounding tissues. Invasive breast cancer occurs when the tumor cells move to other organs or neighboring tissues. One important step in the development of breast cancer is metastasis. Tumor microenvironment: Blood arteries, immune cells, and connective tissue are some of the elements that make up the tumor microenvironment. These components interact with cancer cells to support their growth, survival, and immune system evasion. Angiogenesis (blood vessel growth), the inflammatory processes tied to the tumor microenvironment, and the resulting tumor spreading are the two main mechanisms in the tumor microenvironment that fuel the spread of cancer. Typical Breast Tissue: Fat tissues (adipose), supporting tissues (connective), ducts (the

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tubes which channeled milk to the nipple) and lobules (the glands specialized in producing milk) compose the normal breast tissue. Hormones, particularly progesterone and estrogen, are essential in controlling the development and operation of these tissues.Hormonal Influences: the fact that estrogen and progesterone are more powerful for women than for men is undisputed. Therefore, during the period of breast development, they compensate for hormonal deficit by proliferation of glandular tissues. Breast cancer is a malignant tumor of the body that consists of cells that include hormone receptors, for instance, progesterone and estrogen, which make them submissive to the presence of those hormones in the body. Breast tumors that express hormone receptors are frequently amenable to hormonal treatments, including aromatase inhibitors or tamoxifen.Subtypes of Molecular Structures: Breast cancer is a heterogeneous disease and with the help of molecular subtypes that are individually characterized by molecular expression pattern.

Diagnosis and Staging:

Diagnostic of breast cancer can be defined as collection of imaging tools (MRI, CT, and mammography), tissue sample (biopsies), and molecular test. This requires determining the extent of disease transmission via the use of stages. The ordinary staging is appraised on the bases of TNM system (Tumor, Node, metastases) whereby the main tumor sizes, nodes involvement and metastases are considered.Genetic mutations, hormone changes, cell division, metastasis, and interactions within the tumor microenvironment are all part of the dynamic and intricate pathophysiology of breast cancer. Understanding these pathways better has allowed for the creation of tailored treatment plans and targeted treatments, which have improved results for those with breast cancer. New discoveries are being made via ongoing research, which helps to improve treatment and diagnostic approaches for the prevention of breast cancer.

Epidemiology: With over 2.3 million new cases reported yearly, breast cancer is the most frequent disease diagnosed in women worldwide. Although it primarily affects women, breast cancer may strike men as well. Age, family history, genetic mutations (e.g., BRCA1, BRCA2), hormone effects, and lifestyle choices are risk factors. Although higher survival rates have resulted from early identification through screening programs, breast cancer is still a major global public health problem. [11].

Diagnosis

1. Clinical Evaluation: The initial steps in the diagnosis of breast cancer often involve a thorough history and physical examination by a medical professional. [12].
2. Imaging Research: Mammography is an essential imaging modality for the diagnosis of breast cancer because it produces detailed X-ray images. Other tests, such as magnetic resonance imaging (MRI) and ultrasound, could be used for a more comprehensive evaluation.**3. Biopsy:** To get a small tissue sample from the probable site and provide a conclusive diagnosis, a biopsy is required. Fine-needle aspiration, core needle biopsy, and surgical biopsy are the three methods available for biopsies. [13].

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4.Pathological Analysis: Try finding treatments for this disease using pathological studies on the samples to know whether the cells are cancerous or not and how many cancer cells are present.

5. Hormone Receptor Testing: According to the expression of the estrogen and progesterone receptors, the hormone receptor testing determines public cancer presence or sensitivity to a hormonal therapy treatment. [14].

6. HER2 Testing: For cancer patients that prevent HER2, Human Epidermal Growth Factor Receptor 2 (HER2) tell overexpression and give the targeted therapy in the example Herceptin.

7. Genetic Testing: Adding genetic evaluation to existing tests to unveil the hereditary mutations particularly of the BRCA1 and BRCA2 gene will allow to inspect the family history and inform treatment choices.

8. Staging: To set a suitable treatment plan and make an accurate prognosis, it is crucial to obtain sizes and numbers of the lymph nodes and determine the chances for the cancer's if spreading.

9.Multidisciplinary Review: An individual prognosis is obtained through teamwork by a oncologist, pathologist, radiologist and a surgeon. Thus, an accurate prognosis is crucial for the development of personalized treatment plans.

10. Patient education: It is vital to give the patient the correct information about their diagnosis including the available treatment modalities and support services that they may utilize to make sure they are able to make informed decisions and navigate through depression. [15].

CLASSIFICATION:

1-Ductal In Situ (DCIS): DCIS is a non-invasive formulation for breast cancer where irregular cells are found in the facing of a breast duct but have not blowout beyond it[16,17].

2-Invasive Ductal (IDC): IDC is the most common type of invasive breast cancer, initiating in the milk ducts and insightful adjacent breast tissues.

3-Aggressive Lobular Carcinoma (ILC): ILC starts in the milk-producing lobules and has a unique growth pattern, often presenting as subtle thickening rather than a different lump.

4-Tripartite-Negative Breast Cancer: This subtype deficiencies and does not overexpress HER2. It inclines to be more aggressive and may necessitate different treatment tactics. This process aids in defining their vulnerability and looking for into shielding measures.Speaking with medical professionals is advised for women who wish to control their hormones, particularly if taking oral contraceptives or hormone replacement therapy (HRT) may raise their chance of developing breast cancer. These discussions are indispensable for seeing the individual health needs of each patient and assisting you in selecting a therapeutic plan. Regular checkups and foremost a healthy lifestyle are examples of precautionary actions that can reduce the risk of breast cancer. Frequent bodybuilding, a balanced diet, and moderate alcohol use are all

components of a healthy lifestyle. As breastfeeding may lower a woman's chance of developing breast cancer, it is a helpful preventive strategy against the illness.Genetic Testing and Counseling: Genetic testing and counseling may be helpful for those detection breast cancer

HER2-Positive Breast Cancer: This cataloguing contains tumors that overexpress the HER2 protein, manufacture them more aggressive. Targeted therapies, such as Herceptin, are often used in treatment. [18].

Vigor discrepancies in breast cancer

Cultural Disparities: Different racial and ethnic groups experience differences in breast cancer incidence, diagnosis, and prognosis. Black women are more likely than White women to die from the disease. Women of African descent are disproportionately affected by several subtypes of breast cancer, such as triple-negative breast cancer, which raises their rates of morbidity and death. [19]. Screening Disparities: There are still differences in the rates of mammography screening, with disadvantaged groups frequently having lower involvement, which makes early detection more difficult. Genetic Testing Disparities: This can also cause some basic imbalances among individuals in the risk estimation and re-extra measures in the cases when there is limited access to genetic tests and genetic counselling, which can lead to not diagnosing the inherited genetic risk factors. Implicit Bias: Care delivery may be affected by the mental imprints, or the unconscious prejudices carried by some healthcare professionals. The prejudices can come from upbringing, environment or a repeated exposure to a specific bunch of people. As a result these stereotypes may affect the dialogue with patients, screening selection, and the prescribed treatment too. One of the possible causes may be localisation. Public Health Interventions: From targeted outreach and education to better access to services of healthcare and addressing the socio-economic determinants of health, the diversity of public health actions required to fight breast cancer inequities and ensure that everyone gets what is just, cannot be underestimated.

Socioeconomic Factors: Social class often determines how fast women from underprivileged groups receive the diagnosis, and the results are normally not satisfactory.

[20] Critical for the option of healthcare-related resources, insurance coverage, and income restraints are the factors that aggravate the situation. Geographic Disparities: Breast cancer outcomes are affected by geographical areas disparities that includes screening rates and specialised care access in addition of treatment options variances. Healthcare Access: The standard of healthcare is deeply concerning in regions that are poorly equipped or have limited resources, and residents of rural areas and underprivileged communities struggle to receive proper diagnosis and treatment in time. Cultural and Linguistic Barriers: Language disparities, cultural views as well as the distrust of health care system can substantially disrupt proper communication, detection of the disease in its early stages and adherence to the treatment plans, predominantly among the minority groups.Triple-Negative Breast Cancer Disparities [21].

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CONCLUSION

In fact such an early detecting and treatment of the initial phases of breast cancers must be an urgent issue for the whole world. In addition, the discovery of the cause would enable the expansion of the notion as well asimplementation of the principles of early diagnosis and treatment of breast cancer among the respective family and community. Researchers and nurses, doctors and civil servants will have to collaborate as a team, giving their best to put an end to this dreadful disease and the shaking future of those who unfortunately suffer from it.

Conflict of interests.

There are no conflicts to declare.

References

1- B, K. land., C, E. Mopeland., K, V. Slimberg., & G, W. Jradishar. "The Breast-E-Book: Comprehensive Management of Benign and Malignant Diseases", English (US). *Elsevier Inc*, Fifth Edition . Jan. 2018

2- D, Suan., & B, I. Luxton. , "Evolution of Medical Approaches and Prominent Therapies in Breast Cancer", *Cancers*, vol.14,no.10, pp.2450,May.2022.

3- S, Muhammed., A, Sbdallah., A, Llsadoun., H, Y. Hamid., G. Rasim.,& H, Aassan., "Oncological Horizons: The Synergy of Medical and Surgical Innovations in Cancer Treatment", *Cureus*, vol.15,no.11, pp.e49249,Nov. 2023.

4- O, Omotoso., T, J. Oeibo., A, F. Atiba., O, T., Paimo, O. Kladimeji., F. S, Ataya., G.E, Batiha & A. Alexiou, , "Addressing cancer care inequities in sub-Saharan Africa: current challenges and proposed solutions", *International Journal for Equity in Health*, vol.22no.189, Sep.2023 .

5-H, I., Majeed, A., M, Iasood., Ashraf, W., Imran, I., Saeed, H., ... & Rasool, M. F. ," A national survey to assess breast cancer awareness among the female university students of Pakistan", *PloS one*, vol.17,no.1, pp. e0262030,Jan.2022.

6- A, Tone., T, Boghosian., A, Ross., E, Baugh., A. D, Altman., L, Dawson., F, Reid & C, Crawford., "Understanding the Experience of Canadian Women Living with Ovarian Cancer through the Every Woman StudyTM", *Current Oncology*, vol. 29,no.5,pp. 3318-3340,May.2022.

7- S, S. Chapadgaonkar., S, S. Bajpai., & M, S. Godbole, "Gut microbiome influences incidence and outcomes of breast cancer by regulating levels and activity of steroid hormones in women", *Cancer Reports (Hoboken),* vol.6,no.11,pp.e1847,Nov.2023

8- S, Satish., J. F., Moore, J. M., Littlefield, I. J. Bishop, & K. E. Rojas., "Re-Evaluating the Association Between Hormonal Contraception and Breast Cancer Risk". *Breast Cancer: Targets and Therapy*, vol.15,pp.227-235, Mar. 2023.

9- R, Rodrigues., D, Duarte., & V, Nale. , ", Drug repurposing in cancer therapy: Influence of patient's genetic background in breast cancer treatment ", *International Journal of Molecular Sciences*", vol. 23,no.8, pp.4280,Apr. May.2022.

10- P, S. Landrangi., C,Phittineedi., C, R., Mosquera, J. A. N., Llaguno, S. N. S., Mohiddin, G. J., & Maddu, N. , "Role of lipoproteins in the pathophysiology of breast cancer", *Membranes*, vol.12,no.5, pp.532,May.2022.

11-S, J. Tmith., O, M., Faulkner, D., H, Gmith., & Intes, X. , "Deep learning in macroscopic diffuse optical imaging". *Journal of Biomedical Optics*, vol. 27,no.2, pp.020901,Feb.2022.

12- M. I. Ochoa. , "*Compressive Hyperspectral Single-Pixel Imaging for Lifetime Imaging and Tomography Applications*". PhD. Thesis.School of Engineering .United States. *Rensselaer Polytechnic Institute*, Aug.2022.

13-T, Parantino., V, Giale., P, M. Fress., Hu, X., Penault-Llorca, F., Bardia, A., ... & Curigliano, G. , "ESMO expert consensus statements (ECS) on the definition, diagnosis, and management of HER2-low breast cancer", *Annals of Oncology*, vol.34,no.8,pp. 645-659,Aug.2023.

14- M, Dong., Q. Liu, Y. Xu, & Q. Zhang, , "Extracellular vesicles: the landscape in the progression, diagnosis, and treatment of triple-negative breast cancer", *Frontiers in Cell and Developmental Biology*, vol.10,no.1,pp.842898,Mar.2022.

15- D, Nitsch., W, A., Untch, M., J, C., Albert, U. S., Banys-Paluchowski, M., ... & Thill, M.,"AGO recommendations for the diagnosis and treatment of patients with early breast cancer": *Breast Care*, vol.17,no.4, pp.403-420,Aug.2022.

16- G. M., Nechay, Bocharov, B. P., Voievodina, M. Y., & Levikov, Y. V. BREAST CANCER DETECTION USING BINARY CLASSIFICATION. *Громадська організація «Системні дослідження»*, 114.

17- B, Smolarz., A.Z. Nowak., & H. Romanowicz , "Breast cancer—epidemiology, classification, pathogenesis and treatment (review of literature)", *Cancers*, Vol.14,no.10,pp. 2569,May.2022.

18- T, Roche, L. A., Acevedo-Mesa, A., Lizarazo, I. L., Devassy, R., Becker, S., Krentel, H., & De Wilde, R. L. ," Hormonal Contraception and the Risk of Breast Cancer in Women of Reproductive Age: A Meta-Analysis", *Cancers*, vol.15,no.23, pp.5624,Nov.2023.

19- Y., Gao, & Heller, S. L. "Health disparity and breast cancer outcomes in Asian women", *RadioGraphics*, vol.42,no.7, pp.1912-1924, Dec.2022.

20- N, Stabellini., J, Cullen.,L. Cao, J, Shanahan., N. Hamerschlak, K., Waite,J.S. Barnholtz-Sloan & A.J. Montero, "Racial disparities in breast cancer treatment patterns and treatment related adverse events", *Scientific Reports*, vol.13,no.1, pp.1233,Jan.2023.

21- S., -Joshi, Garlapati, C., & Aneja, R. ," Epigenetic determinants of racial disparity in breast cancer: looking beyond genetic alterations", *Cancers*, vol.14,no.8, pp.1903,Apr.2022.

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الخلاصة

في هذه الدراسة اشكال متعددة الأوجه لسرطان الثدي، ويستكشف تطوره ومنهجيات التشخيص والاستراتيجيات الوقائية. إن نشأة سرطان الثدي معقدة، وتتشكل نتيجة لتقارب العوامل الوراثية والهرمونية والبيئية. تؤدي الطفرات الجينية، ولا سيما BRCA1 وBRCA2، إلى رفع القابلية للإصابة، مع التركيز على العنصر الوراثي. تمارس الهرمونات، وخاصة هرمون الاستروجين، تأثيرات محورية، مما يغذي النمو غير المنضبط للخلايا غير الطبيعية في أنسجة الثدي. إن فهم هذه العوامل أمر بالغ الأهمية لتصميم أساليب الوقاية والعلاج. التشخيص المبكر له أهمية قصوى في تعزيز فعالية العلاج. التصوير الشعاعي للثدي، وهو حجر الزاوية في فحص سرطان الثدي، يسمح باكتشاف الأورام قبل ظهورها السريري. توفر طرق التصوير المتقدمة، مثل التصوير بالرنين المغناطيسي (MRI) والموجات فوق الصوتية، رؤى تكميلية، مما يساعد في تحديد المراحل بدقة. تعمل أدوات التشخيص الجزيئي، بما في ذلك تحديد ملامح التعبير الجيني واختبار HER2/neu، على تمكين استراتيجيات العلاج الشخصية وتحسين النتائج. وتشمل استراتيجيات الوقاية تعديلات نمط الحياة والتدخلات الطبية. يساهم الحفاظ على وزن صحي وممارسة النشاط البدني بانتظام والحد من استهلاك الكحول في تقليل المخاطر. وقد أثبتت الوقاية الكيماوية، التي تشمل أدوية مثل عقار تاموكسيفين وراالوكسيفين، فعاليتها لدى الأفراد المعرضين لمخاطر عالية. يمكن النظر في العمليات الجراحية الوقائية، مثل استئصال الثدي أو استئصال المبيض، لأولئك الذين لديهم استعداد وراثي قوي. أحدث التقدم في الفهم الجزيئي ثورة في علاج سرطان الثدي. تظهر العلاجات المستهدفة، مثل تراستوزوماب ومثبطات الأروماتاز، فعاليتها مع آثار جانبية أقل مقارنة بالعلاج الكيميائي التقليدي. يمثل العلاج المناعي، الذي يسخر جهاز المناعة في الجسم، حدودًا متطورة في علاج سرطان الثدي. في الختام، يقدم هذا الملخص نظرة شاملة عن سرطان الثدي، تشمل تطوره، ومنهجيات التشخيص، والاستراتيجيات الوقائية. ومع البحث المستمر والجهود التعاونية، هناك تفاؤل بشأن التقدم المستمر في الكشف المبكر والعلاجات الشخصية، وفي نهاية المطاف التغلب على هذا المرض الهائل. يبشر المشهد المتطور لأبحاث سرطان الثدي وتدخلات الرعاية الصحية بتحسين نتائج المرضى وتشكيل مستقبل مع تقليل عبء سرطان الثدي.

الكلمات المفتاحية: جين سرطان الثدي 1، جين سرطان الثدي 2، مستقبل عامل نمو البشرة البشرية 2، التصوير بالرنين المغناطيسي