



International Journal of Research in Pharmacology & Pharmacotherapeutics (IJRPP)

IJRPP | Vol.14 | Issue 2 | Apr - Jun -2025

ISSN: 2278-2648

www.ijrpp.com

DOI : <https://doi.org/10.61096/ijrpp.v14.iss2.2025.363-367>

Review

Histopathological Analysis of Breast Cancer Using Hematoxylin and Eosin Staining: Diagnostic and Prognostic Insights



Dr. Shaik parveen, M. Rishitha, M. Pavani, M. Gayathri

Assistant professor, Mallareddy college of pharmacy

Student, Mallareddy college of pharmacy

*Author for Correspondence: M.Rishitha

Email: rishithamogudampally@gmail.com

	<p>Abstract</p>
<p>Published on: 20 May 2025</p>	<p>Millions of people worldwide are still impacted by breast cancer, a complicated and common health issue. This review article offers a thorough examination of the complex field of breast cancer, clarifying the wide range of risk factors that contribute to its development and investigating developments in diagnostic techniques. Millions of people worldwide are still impacted by breast cancer, a complicated and common health issue. Numerous risk factors, including genetic predispositions such BRCA mutations, hormonal impacts, lifestyle factors, and reproductive patterns, have been found through a thorough review of recent literature. The complex aetiology of breast cancer is further influenced by environmental variables, age, and family history. New technologies like magnetic resonance imaging and molecular testing complement mammography, the mainstay of breast cancer screening, to increase the sensitivity and specificity of breast cancer diagnosis. Despite these developments, it is still difficult to guarantee that screening programs are widely accessible, especially in environments with low resources. This review concludes by highlighting the significance of comprehending the various risk factors that contribute to the development of breast cancer and the vital role that developing diagnostic techniques play in improving early detection. The critical significance that diagnostic technologies play in the early diagnosis and treatment of breast cancer is also outlined in this review.</p>
<p>Published by: DrSriram Publications</p>	
<p>2025 All rights reserved.  Creative Commons Attribution 4.0 International License. </p>	<p>Keywords: Hematoxylin, Diagnostic</p>

INTRODUCTION

Breast cancer is one of the many common malignant tumours that affect women. Numerous internal and external variables contribute to the development and occurrence of breast cancer.[1–3] Its incidence is associated with poor lifestyle choices, environmental conditions, and social-psychological factors. It has been shown that genetic mutations and family history account for 5–10% of breast cancers, while potentially modifiable factors account for 20%–30% of cases.[4] Breast cancer begins in the cells of the breast. A malignant tumour is a group of cancer cells that have the ability to invade and kill surrounding tissue. It might spread throughout

the body as well. Occasionally, breast cells experience alterations that impair their ability to proliferate or behave normally. These alterations may lead to atypical hyperplasia and cysts, which are non-cancerous breast diseases. Furthermore, they could lead to benign tumours such as intraductal papillomas.

However, alterations to breast cells can sometimes lead to breast cancer. The cells lining the ducts—the tubes that transport milk from the glands to the nipple are usually where breast cancer starts. This kind of breast cancer is known as ductal carcinoma. Cancer can also develop from the cells of the lobules, which are groups of glands that produce milk. This kind of cancer is known as lobular carcinoma. Both lobular and ductal carcinomas have the potential to be in situ, meaning they have not migrated to other tissues and are still located in the original site. Additionally, they could be invasive, which means that they have infiltrated the surrounding tissues. Less prevalent kinds of breast cancer can also appear. They consist of inflammatory breast cancer, breast Paget disease, and triple-negative breast cancer. Soft tissue sarcoma and non-Hodgkin lymphoma are rare types of breast cancer.

East cancer is a complex illness with many behavioral/lifestyle, environmental, and genetic components. In order to understand breast cancer's incidence and support early identification, the current review set out to examine the epidemiology and risk factors linked with the disease worldwide. The primary risk factors for breast cancer are genetic factors, particularly family history; diet and obesity; smoking and drinking; ionising radiation; and still other factors, such as menstruation, bears, and lactation, which can also influence the incidence of breast cancer. As our nation's quality of life improves, women are becoming more and more obese and eating a diet that tends to be higher in fat. In our daily lives, we should attempt to stay away from using cosmetics that contain oestrogen in order to decrease the effect that exogenous hormones have on the body.

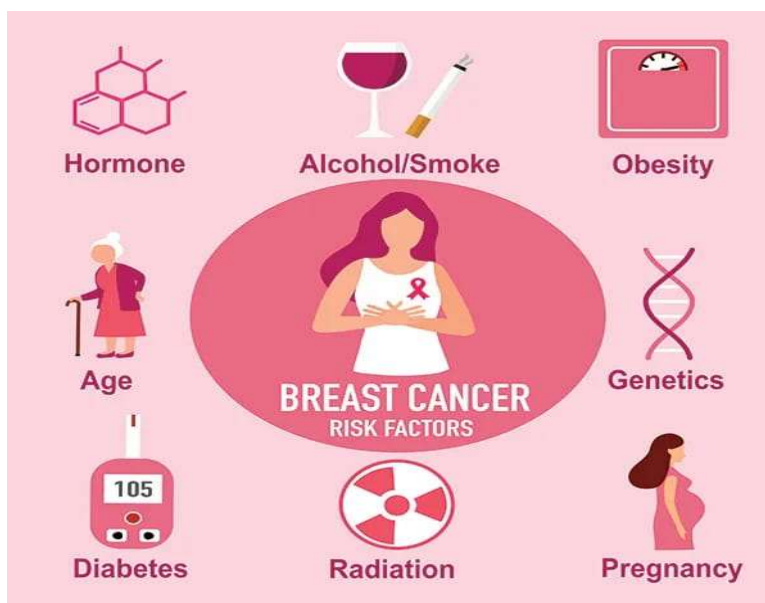
Types of breast cancer

1. **Ductal breast cancer:** It is a early state non invasive cancer. It effects to ducts of breast milk.
2. **Invasive ductal cancer:** it is a no special type carcinoma because the cancer cells don't have microscopic features that classify them as a specific type of breast cancer.
3. **Inflammatory breast cancer:** it effects to skin and lymph vessesls of breast. It is a aggressive and fast growing breast cancer.
4. **Metastatic breast cancer:** it is a stage of cancer that spread to all parts of the body and breast.
5. **Triple negativity breast cancer:** 3 proteins shows negative in case of this negativity cancer.
 - Estrogen
 - Progesterogen
 - Hormone epidermal growth factor
6. **Lobular breast cancer:** spread to lobules.
Lobules are main granular tissue which make milk.

Signs and symptoms

- lump in the breast
- a lump in the armpit
- pain in the breast
- bloody discharge from the nipple and changes in the shape or texture of the nipple
- Irritation or dimpling of breast skin.
- Redness or flaky skin in the nipple area or the breast.
- Breast or skin over the breast.

Risk factors



Complications

- Cancer related pain
- Spinal compression
- Hyper calcemia
- Lung tumor
- Plural effusion
- Weight loss
- Blockage of bile ducts
- Brain tumor
- Psychology related anxiety and depression
- Blood clot
- Nerve damage
- Lymphedema
- Chemical changes in body
- Fatigue

Diagnosis

Mammography

Diagnostic mammography is an x-ray that creates an image of the breast using low radiation doses. It is used to follow up on unexpected findings from a clinical breast exam or a screening mammogram.

It is also possible to use mammography during a biopsy to identify an abnormal area.

Ultrasound

An ultrasound uses high-frequency sound waves to produce images of different bodily parts. It is employed to identify if a breast mass is a cyst or a solid tumour.

Medical practitioners can also use ultrasonography to guide them to the biopsy site. To find out if liver metastasis has occurred, patients with advanced breast cancer may have an ultrasound.

Biopsy

A biopsy is the only reliable method for identifying breast cancer. Removing tissues or cells from the patient's body for laboratory analysis is the aim of a biopsy. Whether or not cancer cells were found in the sample will be determined by the pathologist's report. Whether the lump is palpable that is, you can feel it or non-palpable that is, you cannot will determine the sort of biopsy that is

done. The doctor may use mammography or ultrasound to find the area to be tested. You can go home after the bulk of biopsies are finished, which are usually done in a hospital.

Core biopsy

Removes tissue from the body using a unique hollow needle. It is employed by doctors to obtain a sample from a breast region that is thought to be suspicious. During the procedure, they might take several samples from the area. To remove more tissue through the hollow needle, doctors occasionally use a special vacuum. Vacuum-assisted core biopsy is the name of this method.

Fine needle aspiration

uses a syringe and a very thin needle to remove a tiny quantity of tissue from a lump. It assists medical professionals in identifying if a bump is a solid tumour or a cyst. Fine needle aspiration (FNA) cannot identify whether a malignancy is invasive or non-invasive. Under the guidance of palpation or imaging methods like ultrasound, a medical practitioner inserts a tiny needle into the breast lump during the treatment. Cells or fluid are suctioned out of the lump using a syringe that is connected to the needle. A pathologist next looks at these cells or fluid samples under a microscope to identify if they are malignant (cancerous) or benign (not cancer). A minimally invasive technique called FNA can reveal important details regarding the type of breast lump. By examining the properties of the cells, identifying the presence of malignant cells, and directing additional diagnostic or Therapeutic procedures, it aids in the diagnosis of breast cancer. However, for a more thorough assessment, other tests like a surgical biopsy or core needle biopsy can be suggested, depending on the circumstances.

Treatment

Surgery

Aims to remove breast cancer with a margin of normal tissue to reduce the risk of cancer coming back in breast and try to stop any spread in the body.

Types

1. Breast conserving surgery(BCS)/ Partial or symmetrical mastectomy/
2. Lumpectomy/Quadrantectomy.
3. Mastectomy
4. Lymph node surgery
5. Reconstructive surgery

Chemotherapy

The treatment of disease by the use of chemical Substances especially the treatment of cancer by cytotoxic and other drugs.

Types

1. Intravenous chemotherapy
2. Oral chemotherapy
3. Electro chemotherapy

Hormonal therapy

It is a another form of systemic therapy .
It reduces the risk of cancer coming back after surgery.

Types:

1. Drugs that lowering amount of estrogen in body.
2. Drugs that blocks action of estrogen on breast cancer cells.

CONCLUSION

Millions of people are affected by breast cancer every year, making it a major global health concern. The complexity of breast cancer has been highlighted in this study, along with a number of risk factors and diagnostic techniques that are essential to comprehending and treating the condition. Furthermore, improvements in diagnostic methods have greatly enhanced the results of early detection and treatment. Together with cutting-edge technology like molecular testing and magnetic resonance imaging, mammography is essential for detecting breast cancer early on, allowing for timely intervention and possibly improving patient outcomes. Going forward, it will be crucial to conduct further study to find new risk factors, improve screening techniques, and provide tailored treatments. In addition, raising awareness, supporting easier access to screening, and encouraging international

cooperation between researchers and medical professionals are all critical in the continuous battle against breast cancer.

Fighting breast cancer and lessening its effects on people and society around the world requires an all-encompassing strategy that incorporates research, education, early detection, and easily available healthcare services. One of the most prevalent and deadly illnesses impacting women globally is breast cancer. Survival rates have been greatly increased by early discovery through routine screenings, knowledge of risk factors, and improvements in medical treatments. To improve prevention, diagnosis, and care, more research, instruction, and assistance are needed. Giving people information and promoting preventative health habits can improve results and eventually aid in the battle against breast cancer.

REFERENCES

- Obeagu EI, Babar Q, Vincent CC, et al. Therapeutic targets in breast cancer signaling: a review. *J Pharm Res Int.* 2021;33:82–99.
- Aizaz M, Khan M, Khan FI, et al. Burden of breast cancer: developing countries perspective. *Int J Innov Appl Res.* 2023;11:31–7.
- Ibekwe AM, Obeagu EI, Ibekwe CE, et al. Challenges of exclusive breastfeeding among working class women in a teaching hospital South East, Nigeria. *J Pharm Res Int.* 2022;34:1.
- Sun YS, Zhao Z, Yang ZN, et al. Risk factors and preventions of breast cancer. *Int J Biol Sci.* 2017;13:1387–97.
- Sinha T. Tumors: benign and malignant. *Cancer Ther Oncol Int J.* 2018;10:555790.
- Edward U, Obeagu EI, Okorie HM, et al. Studies of serum calcium, inorganic phosphate, and magnesium levels in lactating mothers in Owerri. *J Pharm Res Int.* 2021;33:209–16.
- Obeagu EI, Ahmed YA, Obeagu GU, et al. Biomarkers of breast cancer: overview. *Int J Curr Res Biol Med.* 2023;8:8–16.
- Iatrakis G, Zervoudis S. Epidemiology of ductal carcinoma in situ. *Chirurgia (Romania).* 2021;116(5 Suppl):S15–S21.
- Jagsi R, Mason G, Overmoyer BA, et al. Inflammatory breast cancer defined: proposed common diagnostic criteria to guide treatment and research. *Breast Cancer Res Treat.* 2022;192:235–43.
- Pedersen RN, Esen BO, Mellekjær L, et al. The incidence of breast cancer recurrence 10–32 years after primary diagnosis. *J Natl Cancer Inst.* 2022;114:391–99.
- Hu X, Zhang Q, Xing W, et al. Role of microRNA/lncRNA intertwined with the Wnt/ β -Catenin axis in regulating the pathogenesis of triple-negative breast cancer. *Front Pharmacol.* 2022;13:814971.
- Thigpen D, Kappler A, Brem R. The role of ultrasound in screening dense breasts—a review of the literature and practical solutions for implementation. *Diagnostics.* 2018;8:20.
- Vatankhah H, Khalili P, Vatanparast M, et al. Prevalence of early and late menopause and its determinants in Rafsanjan cohort study. *Sci Rep.* 2023;13:1847.
- Garnæs KK, Elvebakk T, Salvesen O, et al. Dietary intake in early pregnancy and glycemia in late pregnancy among women with obesity. *Nutrients.* 2022;14:1015.
- Mills ZB, Faull RLM, Kwakowsky A. Is hormone replacement therapy a risk factor or a therapeutic option for Alzheimer's disease? *Int J Mol Sci.* 2023;24:3205. [DOI] [PMC free article] [PubMed] [Google Scholar]
- Kunyahamu MS, Daud A, Jusoh N. Obesity among health-care workers: which occupations are at higher risk of being obese? *Int J Environ Res Public Health.* 2021;18:4381.
- Belachew EB, Sewasew DT. Molecular mechanisms of endocrine resistance in estrogen-positive breast cancer. *Front Endocrinol.* 2021;12:689705.
- Heer E, Ruan Y, Mealey N, et al. The incidence of breast cancer in Canada 1971–2015: trends in screening-eligible and young-onset age groups. *Can J Public Health.* 2020;111:787–93.
- Van Ourti T, O'Donnell O, Koç H, et al. Effect of screening mammography on breast cancer mortality: Quasi-experimental evidence from the rollout of the Dutch population-based program with 17-year follow-up of a cohort. *Int J Cancer.* 2020;146:2201–8. [DOI]
- Buist DSM, Abraham L, Lee CI, et al. Breast biopsy intensity and findings following breast cancer screening in women with and without a personal history of breast cancer. *JAMA Intern Med.* 2018;178:458–68. [DOI] [PMC free article] [PubMed] [Google Scholar]
- Maio F, Tari DU, Granata V, et al. Breast cancer screening during COVID-19 emergency: patients and department management in a local experience. *J Pers Med.* 2021;11:380.
- Li MR, Liu MZ, Ge YQ, et al. Assistance by routine CT features combined with 3D texture analysis in the diagnosis of BRCA gene mutation status in advanced epithelial ovarian cancer. *Front Oncol.* 2021;11:696780.