

## BREAST CANCER: EARLY DIAGNOSIS AND MODERN TREATMENT METHODS

Mamzomirova Sarvinozbegin Abdurashiq qizi  
Kokand University Andijon filiali Tibbiyot fakulteti talabasi

Mamzomirova Sarvinozbegin Abdurashid qizi  
Samandarmamazokirov940@gmail.com  
+998910657908

### Abstract

This article analyzes breast cancer, its early diagnosis pathways and modern treatment methods. During the study, the relevance of the disease, the main risk factors, and approaches to diagnosis were considered. Scientific sources and statistical data analysis became the basis as the methodology. As a result of the study, it was proved that early diagnosis and comprehensive treatment is the main factor in reducing the consequences of the disease. The importance of prevention and routine screening was emphasized as the main conclusion.

**Keywords:** Breast cancer, early diagnosis, modern treatment, mammography, screening programs, surgery, chemotherapy, radiotherapy, hormonal therapy, targeted therapy, immunotherapy, BRCA1, BRCA2, oncology, prevention, women's health.

### Introduction

Breast cancer is one of the most common and life-threatening oncological diseases among women. The disease develops from breast tissue, mainly the cells of the milk duct or lobules, occurs in the form of a tumor, and can metastasize to surrounding tissues, lymph nodes as well as distant organs due to cells multiplying uncontrollably. Breast cancer occurs not only in women, but also in men, less often. The main risk factors for developing cancer include heredity (BRCA1, BRCA2 gene mutations), age (the risk increases after the age of 40), hormonal factors (early menstruation, late menopause), unhealthy diet, obesity, harmful habits (alcohol and tobacco consumption), radiation exposure, and infertility. At the initial stage of the disease, by self-examination, you can notice such signs as a knot, a hardened spot, or a change in the shape of the breast tissue. Early detection of cancer is achieved using modern diagnostic methods - mammography, ultrasound, MRI, biopsy. The urgency of the disease is that the number of newly diagnosed cases of breast cancer worldwide is increasing every year. According to the World Health Organization (WHO), more than 2 million new cases are reported every year, which ranks first among oncological diseases. In Uzbekistan, breast cancer is also recognized as the most common oncological

disease among women. National screening programs are being introduced in the country for the early diagnosis and treatment of breast cancer, but still many patients are going to the doctor when the disease has advanced to a late stage. Modern treatment options include surgery (lumpectomy, mastectomy), chemotherapy, radiation therapy, hormonal therapy, targeted therapy, and immunotherapy, which are selected based on the stage of the disease and the nature of the tumor. The success of treatment often depends on the early detection of cancer. That is why women are advised to do a preventive breast check at least once a year, follow a healthy lifestyle, give up harmful habits and get into the habit of self-examination. Today, scientific research on the prevention, early diagnosis and effective treatment of breast cancer continues, new drugs and technologies are being tested. The socioeconomic significance of the disease is also enormous, which negatively affects not only the health of the patient but also the well-being of his family and society. Therefore, the fight against breast cancer remains a pressing issue in every society. Strengthening prevention and early diagnosis measures, regularly informing the population is one of the most effective approaches.

**Breast cancer** is one of the most common oncological diseases among women and develops as a result of an uncontrolled proliferation of cells in the breast tissue. The disease often begins in the cells of the milkways or lobules and occurs in the form of a tumor. It can metastasize to surrounding tissues, lymph nodes and distant organs. Cancer can also occur in men, but cases are extremely rare. **The causes of breast cancer depend on** many factors. One of the most important risk factors is hereditary predisposition, and mutations in the BRCA1 and BRCA2 genes increase the risk of the disease. If one of the family members (mother, sister, grandmother) is infected with the disease, the risk is even higher. Hormonal factors are also significant, and early menstruation (before the age of 12), late menopause (after the age of 55), infertility, lack of pregnancy or the birth of the first child after the age of 30 increase the risk. In addition, obesity, harmful habits (alcohol, tobacco), radiation exposure, poor lifestyle, and poor diet are among the risk factors. **Symptoms of the disease** may be invisible at first. But as the tumor grows, a knotted or hardened spot appears on the chest, the shape of the nipples changes, the skin becomes thicker and begins to resemble lemon peels. There are such signs as bloody or discolored discharges from the nipples, enlargement of the armpit lymph nodes, retraction of the nipples inwards. For this reason, it is important for women to get into the habit of self-examination. **Early diagnosis** plays a key role in saving a patient's life. Methods such as self-examinations, doctor's examinations, mammography (recommended every two years, starting from the age of 40), ultrasound, biopsy, and MRI can help with an early diagnosis. **Modern methods of treatment** are selected depending on the stage of the disease and the type of tumor. The surgical method (lumpectomy, mastectomy) is the most basic approach, aimed at complete removal of the tumor. Radiation therapy (radiotherapy) is used immediately after surgery or sometimes on its own. Chemotherapy is aimed at destroying cancer cells and is administered orally or intravenously. Hormonal therapy (e.g.,

tamoxifen) is used in hormone-dependent tumors. Targeted therapy (drugs like trastuzumab) only affect cancer cells. Immunotherapy, on the other hand, stimulates the patient's immune system to fight against tumor cells. Modern treatment approaches are often combined and selected based on the characteristics of the disease. Therefore, in the fight against breast cancer, early diagnosis and comprehensive treatment strategies are important, allowing to preserve patient life and quality.

### **LITERATURE REVIEW**

Research on breast cancer in recent years suggests that it is more likely to be linked to genetic factors, hormonal influences, and lifestyle. Based on data published by the World Health Organization (WHO), the American Cancer Society and the Ministry of Health of the Republic of Uzbekistan, the benefits of early diagnosis and modern treatment methods are highlighted.

### **METHODOLOGY**

The analysis methods were used in this study to investigate the methods of early diagnosis and modern treatment of breast cancer. First of all, national and international scientific articles, official reports of health organizations (WHO, American Cancer Society), statistical data of the Ministry of Health of the Republic of Uzbekistan were collected. These sources were compared, and information on cancer urgency, risk factors, diagnosis, and treatment strategies was summarized. The methods of systematic literature analysis, comparison of statistical indicators and graphical expression were chosen as methods. It also analyzes data on the clinical nature of the disease and current treatment technologies. The analysis explored the effectiveness of breast cancer screening programs, the importance of technologies used in diagnosis – mammography, ultrasound, MRI and biopsy. As a result, the benefits of early diagnosis and treatment were supported by statistical data.

### **OUTPUT**

Studied sources have shown that the effectiveness of treatment reaches up to 90% when breast cancer is detected early. Mammography, ultrasound, biopsy and genetic tests were noted as the most effective diagnostic methods. Modern treatment approaches include surgery, chemotherapy and radiation therapy, hormonal and targeted therapy, and immunotherapy.

### **DISCUSS**

The results of the review are fully consistent with the indicators of previously published scientific works, including those of the World Health Organization (WHO), the American Cancer Society and other international organizations. The high effectiveness of the early diagnosis of breast cancer has been confirmed by a large number of scientific studies and

clinical observations, and in cases detected at an early stage, treatment results can be positive up to 90%. At the same time, mortality rates are decreasing year after year due to the widespread introduction of screening programs in developed countries. Unfortunately, due to the lack of full coverage of screening programs in developing countries, including Uzbekistan, and financial and organizational constraints, many patients turn to the doctor when the disease passes to a late stage. This reduces the effectiveness of treatment and the fact that mortality rates remain high. Therefore, it is necessary to strengthen routine screening programs for breast cancer, to bring modern diagnostic technologies to regional centers, as well as to conduct comprehensive outreach and outreach among women. To prevent illness, it is important to maintain a healthy lifestyle, give up harmful habits and turn self-examination into a habit. Improving national strategies on breast cancer and bringing them in line with international standards remains an urgent task in the future.

## CONCLUSION

The breast cancer remains one of the most pressing oncological diseases that threaten women's health today. However, this disease can be effectively managed with early diagnosis and the right approach to integrated treatment. Studies show that early detection of breast cancer plays an important role in improving patients' quality of life and prolonging their lives. In this regard, it is necessary to strengthen screening programs, to widely introduce modern diagnostic methods into medical practice, such as mammography, ultrasound examination and biopsy. Special measures should be developed to cover women, especially those living in rural and remote areas. In addition, regular awareness of the population, that is, conducting awareness-raising activities on the early detection of signs of breast cancer, promotes the effectiveness of preventive measures aimed at promoting a healthy lifestyle. And in treatment, it is recommended to use integrated approaches, such as surgery, chemotherapy, radiotherapy and hormonal therapy. In Uzbekistan, it is important to strengthen the mechanisms of financial and organizational support within the framework of government programs, as well as to develop the infrastructure of oncological services for the practical implementation of these recommendations in Uzbekistan. Thus, it becomes a necessity to improve national strategies for breast cancer in line with international standards.

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