



THE IMPORTANCE OF MULTIMODAL DIAGNOSTIC METHODS AFTER BREAST CANCER SCREENING

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ABSTRACT

Breast cancer is one of the most common oncological diseases among women, and early detection of the disease significantly improves treatment efficacy and prognosis. However, breast X-ray mammography does not always provide accurate and precise results. Therefore, after screening, it is recommended to perform an ultrasound examination (US) or magnetic resonance imaging (MRI)..

Research Aim. The main aim of the study is to assess the diagnostic significance, accuracy, and clinical effectiveness of ultrasound examination and magnetic resonance imaging methods applied after breast cancer screening.

Materials and Methods. Breast cancer screening research was conducted at RIO and RIATM TVF. During the study, from January to December 2025, a total of 11,374 women underwent screening examinations. The ages of the screened women ranged from 45 to 70 years. All participants underwent X-ray mammography, and when necessary, they were referred for ultrasound examination (US) and magnetic resonance imaging (MRI).

Results. A total of 11,374 women were screened, of whom 495 were classified into BI-RADS 0, BI-RADS 4, and BI-RADS 5 categories. All these cases were referred to regional oncological dispensaries for further examination and treatment. Although breast cancer was suspected in 495 women, only 418 underwent further examinations, while 77 women (15.6%) did not participate in the in-depth follow-up stage. The stratification of cases according to BI-RADS categories was as follows: BI-RADS 0 – % (n=176), BI-RADS 1 – % (n=6350), BI-RADS 2 – % (n=4529), BI-RADS 4 – % (n=284), BI-RADS 5 – % (n=35). Out of 495 women with suspected pathology, 418 underwent comprehensive (in-depth) diagnostic evaluation. Based on the results of the multimodal imaging assessment and morphological verification, the participants were classified into three groups. The first group consisted of women with malignant neoplasms (n = 41). The second group included patients with benign tumors (n = 201). The third group comprised women with other breast diseases (n = 176). The size of the detected lesions ranged from 0.5 to 4.7 cm. Morphological verification was performed in 0.8% of cases (n = 63), including all confirmed cases of breast cancer. According to histological examination results, breast pathologies were confirmed in 418 women. Among the 418 women, ultrasound examination (US) was positive in 370 cases, of which 41 were referred for biopsy and 7 for MRI examination.

Among them, 41 cases (9.8%) were identified as malignant tumors. Among malignant tumors, invasive ductal carcinoma was detected in 21 cases (51.2%), making it the most

common type. Invasive lobular carcinoma was found in 11 cases (26.8%), infiltrative-fibrosing carcinoma in 4 cases (9.8%), medullary carcinoma in 3 cases (7.3%), and mucinous carcinoma in 2 cases (4.9%). Instrumental examination revealed that US showed features typical of pathological foci: irregular shape, uneven contours, and hypoechoic structures. MRI examination showed hyperintense and hypointense signals, while mammography revealed star-shaped, irregular-contoured, and deformed lesions.

Benign tumors were identified in 201 cases (48.1%), the majority of which were fibroadenomas (66.7%). In the remaining 176 cases, other breast diseases were diagnosed, of which 133 were breast cysts (75.6%) and 43 were focal (localized) fibrosis (24.4%).

Conclusion. Although X-ray mammography is the main method in breast cancer screening, it does not always provide complete diagnostic accuracy. Therefore, the use of multimodal diagnostic methods such as US and MRI increases early detection of the disease and improves the effectiveness of clinical decision-making..

