

BREAST RADIOLOGICAL TREATMENT IN THE SCREENING PROGRAM

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ABSTRACT

Introduction: The breast is a symmetrical, paired organ located in the chest. Complete development of the breast occurs during pregnancy. There are many different pathological processes that occur in the breast including malignancy. The Cantonal Breast Cancer Early Detection Program is the first such program implemented in Bosnia and Herzegovina.

Objective: The main objective of this paper is to define and explain radiological diagnostic procedures used in the detection of various diseases and changes in the breast. To prove that mammography remains the gold standard in the early detection of breast cancer, despite newer methods and imaging techniques. The paper will also present the results and advantages of the "Breast Cancer Early Detection Program".

Materials and methods: The study was conducted as a cross-sectional study. Data were collected retrospectively from official data sources provided by the Ministry of Health, Labor and Social Welfare through the Radiological Information System for the University Clinical Hospital in Mostar for our county.

Results: In the first and second phases from 2019 to 2022, mammography was performed on 933 patients at the University Clinical Hospital Mostar, of whom 9 had a positive result. In the third phase of the program (2022-2024), mammography was performed on 2,499 patients. Of these, 18 had positive results.

Conclusions: Despite technological advances, mammography remains the gold standard in early detection of breast cancer. Similar breast cancer screening programs are being implemented in a few countries, including Turkey, Morocco, India, and Saudi Arabia. The results of these programs, as well as the challenges they face, further emphasize the importance and relevance of our county-level program implemented in HNŽ/K County.

Key words: breast, screening, mammography, early detection, health.

INTRODUCTION

The breast is a symmetrical, paired organ located on the chest. In males, it develops until puberty and is usually not sensitive to hormonal influences. Towards the end of the first month of embryonic development, the mammary streaks develop along the ventrolateral side of the trunk, from the base of the arm to the base of the leg. (1) Estrogens during puberty cyclically stimulate the growth of the stroma and ducts, as well as the deposition of fat that increases the volume of the breast. Complete development of the breast occurs during pregnancy. The placenta secretes large amounts of estrogen during pregnancy, which lead to branching and growth of the duct system, enlargement of the stroma and deposition of fat. At least four other hormones influence the growth of the duct system: growth hormone, prolactin, glucocorticoids of the adrenal glands and insulin. (2) There are many different pathological processes that occur in the breast. Breast diseases can be divided into benign and malignant (breast cancer). Benign breast diseases include cysts, lumps, fibroadenomas, nipple

discharge, infections and gynecomastia. (3) Breast pain and cysts often occur together and are included under the common name fibrocystic disease. It is unlikely that fibrocystic disease is associated with the risk of breast cancer. (4) Mammography is the basic examination for the early detection of breast cancer and is accepted as a screening method in asymptomatic women over 40 years of age because it is the only method of breast examination that has been proven to reduce cancer mortality. (5) Mammography involves exposing the breast to X-rays that are unevenly attenuated based on the characteristics of the breast tissue, which determines its sensitivity. (6) The sensitivity of mammography is higher in involutively changed breasts (breasts with a higher proportion of fatty tissue). The radiation dose absorbed by the breast depends on the thickness of the breast tissue, and the absorbed dose increases with breast thickness. (7) The Cantonal Breast Cancer Early Detection Program is the first such program implemented in Bosnia and Herzegovina. (8) The main objective of this paper is to define and explain radiological diagnostic procedures used in the detection of various diseases and

changes in the breast, and to present their advantages and disadvantages. To prove that mammography remains the gold standard in early detection of breast cancer, despite newer imaging methods and techniques. The paper will also present the results and advantages of the "Early Breast Cancer Detection Program".

SUBJECTS AND METHODS

The study was conducted as a cross-sectional study. The participants were not actively involved, and their personal data remained fully protected. The data were collected retrospectively from official data sources provided by the Ministry of Health, Labor and Social Care through RIS (Radiology Information System) for the University Clinical Hospital in Mostar for our county. It included data from 01.01.2019. until 31.12.2024. Initially, the program was planned in two phases. The first phase starts in 2019 and ends in December 2022. Given the number

of women included in the program (32,444) and the planned response rate of 60%, the first phase (2019-2020) covers approximately 19,500 women. The second phase also lasted two years (2021-2022). Inclusion criteria were exclusion from phase 1, age 45 to 69 years. In the first and second phases from 2019 to 2022, mammography examinations were performed for 933 patients at the University Clinical Hospital Mostar. In the third phase of the program (2022-2024), mammography examinations were performed for 2,499 patients at the University Clinical Hospital Mostar. In the period from 01.01.2019 to 31.12.2024, 3,432 patients underwent mammography, 27 of whom had a positive result after the images were reviewed and read by at least two and at most four doctors. The SPSS for Windows and Microsoft Office Excel 2010 software systems were used for statistical data processing.

RESULTS

In the first and second phases from 01.01.2019 to 31.12.2022, mammography examinations were

performed for 933 patients at the University Clinical Hospital Mostar of whom 9 had a positive result.

Institution	Total patients	Positive result
University Clinical Hospital Mostar	933	9

Table 1. The total number of examined patients and the number of positive results for first and second phases

BI - RADS category L-D breast	Total result
4-4	8
5-5	1

Table 2. BI - RADS category L-D breast and total result for first and second phases

4 - 4 means that both doctors gave a category 4, which means that this change is for biopsy.

5 - 5 means that both doctors gave a category 5, which means that this change is more than 94% malignant.

In the third phase of the program (2022-2024), mammography examinations were performed for 2,499 patients at the University Clinical Hospital Mostar. Of these, 18 had positive results.

Institution	Total patients	Positive result
University Clinical Hospital Mostar	2499	18

Table 3. The total number of examined patients and the number of positive results for third phases

BI - RADS category L-D breast	Total result
4 - 4	10
2 - 4 - 4	1
3 - 4 - 4	2
4 - 1 - 4	3
5 - 4	2

Table 4. BI - RADS category L-D breast and total result for third phases

4 - 4, means that both doctors gave a category 4, which means that this change is for biopsy.

2 - 4 - 4, this means that the first doctor assigned a score of 2, indicating a benign finding—something is present, but the doctors are confident it has benign characteristics. As a result, no further routine follow-up is required.

However, the second doctor later assigned a score of 4, suggesting a different assessment, this means that something existed and that it is for biopsy, and the third final finding is 4 this means that something existed and that it is for biopsy, but since this is a cancer screening

program and if one doctor thinks that this is for biopsy, a biopsy is always done so that there is no false reading.

3 - 4 - 4, 3 means that it is a benign finding, but a more recent or additional follow-up is needed, for example with ultrasound, if any asymmetry is observed, then the magnet and if the lymph nodes are highlighted and they need to be further investigated. Soon all 3 BI RADS systems will be omitted due to problems with reading the findings. On the second finding, the doctor put a 4, which means that there are changes and that a biopsy is needed.

4 - 1 - 4, 4 means that a biopsy is needed, the second finding is 1, which means that it is a good finding that there is nothing pathological in the finding, neither good nor bad, the structure of the breast is completely normal, there is no inverted nipple, no lymph nodes, the breast is normal, there are no microcalcifications, no shadowing, but the last finding is 4, which means that it is going to be biopsied again.

5 - 4, 5 means that the first doctor thinks that it is certain that it is a malignant change, the second doctor gave a score of 4, which means that the patient is referred for an urgent biopsy.

DISCUSSION

The study was conducted as a cross-sectional study. The participants were not actively involved, and their personal data remained fully protected. All patients were first imaged with mammography. After reading the findings, depending on the stage, patients were referred for additional tests such as biopsy, ultrasound or magnetic resonance imaging.

BI - RADS category L-D breast and total score for the first and second phase of the program, most doctors gave a score of 4 in the mammogram reading, which means that patients are referred for an urgent biopsy. As a result, we have improved health and the possibility of early detection of breast cancer, which is also the point of the entire program.

The data were collected retrospectively from official data sources provided by the Ministry of Health, Labor and Social Care through RIS (Radiology Information System) for the University Clinical Hospital in Mostar for our county. It included data from 01.01.2019. until 31.12.2024. the target population consisted of patients older than 40 to 65 years and in that period 3,432 patients underwent mammography, 27 of whom had a positive result.

Similar breast cancer screening programs are being implemented in several countries, such as Turkey, Morocco, India, and Saudi Arabia, with the aim of increasing early detection of the disease. The results of these programs, as well as the challenges they face, further emphasize the importance and relevance of our county-level program implemented in HNZ/K County.

CONCLUSIONS

The County Breast Cancer Screening Program is the first such program to be implemented in Bosnia and Herzegovina. The research was part of this program, which includes all women aged 45 to 69, regardless of health insurance status, and the goal of the program is to detect breast cancer at an early stage, which will reduce breast cancer mortality by 23-31%, prolong the life of breast cancer patients and improve the quality of life of breast cancer patients. All patients were first scanned with mammography. Mammography remains the gold standard for early detection of breast cancer despite technological advances. After reading the findings, depending on the calcification in the BI RADS system, patients are referred for additional tests such as biopsy, ultrasound or magnetic resonance imaging. In total, in our county, in the period from 01.01.2019. until December 31, 2024, 3,432 patients underwent mammography examinations at the University Clinical Hospital Mostar, 27 patients had a positive result after reviewing the images and readings by at least two and at most four doctors.

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