

# Accuracy of ultrasound in the detection of breast cancer

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## Abstract

**Background:** Breast cancer accounts one third of registered female cancers and almost one quarter of female deaths from the disease. Ultrasonography has been playing an increasingly role in the evaluation of breast cancer. Breast ultrasound is ascribed a higher sensitivity for detecting breast cancer in women with dense breast tissue, women under the age of 50 and high-risk women. The objective of this study was to assess the accuracy of ultrasound in detection of breast cancer. **Methodology:** The ultrasonography and histopathology reports were reviewed. Sensitivity, Specificity, positive predictive value, negative predictive value, and accuracy of ultrasound were calculated. **Results:** The sensitivity and specificity of ultrasound were 90.4% and 89.8% respectively and the accuracy of ultrasound was 90%.

**Conclusion:** Ultrasound can be used as a screening tool for breast cancer.

**Keywords:** Breast, Cancer, Screening, Ultrasound

## 1. Introduction

Breast cancer is the most frequent cancer among women and accounts for about 23% of all female cancers worldwide. [1] It is the most common type of malignancy among the Iraqi population in general; [1, 2] responsible for about one third of the registered female cancers and almost one quarter of female deaths from the disease [3]. In the last two decades, publications showed increase in the incidence rates of breast cancer, and a tendency to affect younger age group which became one of the major threats to Iraqi female health. [4, 5].

Ultrasonography and mammography are important tools for management of these patients. [6].

Requesting breast imaging depends on different factors such as history, age, symptoms of the patient and other findings on physical examination and the result might be affected by the density of breast. [7].

Ultrasonography has been playing an increasingly important role in the diagnosis of breast cancer. Many specific indications for breast ultrasound, including: clinical evaluation of a palpable mass incompletely assessed at mammography, palpable lesions with associated mammographic asymmetry or no mammographic findings, to differentiation of a cyst from a solid nodule, and if a history of lumpectomy or segmentectomy present. [8, 9].

Sensitivity and specificity of ultrasonography are important indicators in using this test, and were ranged from 67% - 96% and 93% - 97% in different reports. [10, 11].

Breast ultrasound is ascribed a higher sensitivity for detecting breast cancer in women with dense breast tissue, women under the age of 50 and high-risk women. [9].

Thus improving screening sensitivity may improve screening many references suggested to use ultrasound

as supplemental technique in screening. [12].

The objective of this study was to assess the accuracy of ultrasound in detection of breast lesion.

## 2. Methodology

It is a cross-sectional study assessing women with breast lesions for the period between January 2019 and December 2020 in Al-Imamein AlKadhimaiein medical city. Ninety case files were reviewed. There were Ultrasound and pathological reports. The gold standard was the histopathological examination.

The Sensitivity, Specificity, positive predictive value, positive predictive value, and accuracy of ultrasound were calculated.

## 3. Results

Table 1 show the age distribution of patients. The peak was in the age 40-49 years.

Age group	Frequency	Percentage
<20	15	16.6
20-29	20	22.2
30-39	14	15.5
40-49	21	23.3
50-59	13	14.4
>=60	7	7.7
Total	90	100

Table 2 demonstrates the sensitivity and specificity of ultrasound. They were 90.4% and 89.8%, respectively. The positive and negative predictive value were 73.1% and 96.9%. respectively. The assessment of the accuracy of ultrasound was 90%.

Ultrasound	Histopathology	
	Positive	Negative

Positive	19(90.5%)	7(10.1%)
Negative	2(9.5%)	62(89.9%)
Total	21(100%)	69(100%)

#### 4. Discussion

Breast cancer is an important health problem in Iraq. Screening is the first step to preventing breast cancer from spreading in country.

Although mammography is widely used as the gold standard for screening breast cancer, it is not widely available. Ultrasound is accessible tool for breast cancer screening. [13].

In this study, the accuracy of ultrasound in detection breast cancer was 90%. The sensitivity and specificity of were 90.4% and 89.8%, respectively. These findings are similar to the literature (73 - 100%). [14-18].

The negative predictive value was 96.8%. It is similar to numerous literatures reported high negative predictive value up to 100%. [16, 17].

The high sensitivity and specificity of ultrasound was noted in studies that involved either women with breast symptoms or asymptomatic women in a screening program [16]. The observed high sensitivity and specificity might be explained by the fact that the sample was from one hospital only and most of the sample was below the age of fifty were the accuracy of ultrasound decreases after this age. [19].

These findings add to a growing body of literature describing ultrasound's detection capacity for breast cancer. It is known that ultrasound is effective for the detection of small, invasive, node-negative cancers in dense breast tissue better than mammography.

In conclusion, ultrasound can be used screening add tool for breast cancer.

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