GBCS GOIANIA BREAST CANCER SYMPOSIUM 2015
Goiania • Goias • Brazil

Comparison between sonobreast's accuracy in breast tumors under versus over 2 centimeters

Marques, GS[1]; Souza, MD[1]; Saad, GP[1]; Lucena, CEM [2]
[1] Acadêmicos da Faculdade de Medicina/UFMG; [2]

Introduction

Breast cancer constitutes the main cause of death among female population, being considered a disease of great medical relevance. In Brazil, during the 2014 year, 57.120 new cases were diagnosed, with its mortality rating reaching near 23%[1].

It is well known that early detection leads to more favorable prognosis, rising the patients' life expectancy. Because of that, the use of tools wich allow the diagnosis in early stages of the disease has major importance. In this regard, the predictive model Sonobreast[2] was developed, capable of estimating individual risks of malignancy of solid masses in the breast, considering the following parameters: age, family history, shape/margin, ecotexture, orientation, ecogenic halo, posterior acustic shade.:

Objectives

This study's objective is to compare Sonobreast's accuracy in detecting malignancy in tumors larger or smaller than 2cm. In early stages, the mass is more likely to have smaller dimensions, which would make the ultrasonagraphic characteristics less evident, possibly hurting the results of the test..

Methodology

We collected 554 patient records with ultrasound detected tumors and calculated the risk of malignancy according to the Sonobreast software. Then, we built a database utilizing EpiData Software, where all the information were stored. We then compared the obtained result with the biopsy's result (gold standard), calculating, for the two groups (bigger and smaller than 2cm), the following: sensitivity, specificity, positive predictive value, negative predictive value and accuracy. After that, we correlated the correct or incorrect result with the tumor's size, trying to verifiy any influence the size may have on the outcome of Sonobreast evaluation. For all the data analysis, we utilized the version13 of the STATA software.

Results

For tumors not bigger than 2cm (n=335), Sonobreast showed sensibility of 98,95%, specificty of 66,25%, PPV of 53,71% and NPV of 99,38% (figure 1 and table 1).

Table 1 - 2 cm and smaller masses

		Nodule biopsy (gold standard)		
		Malignant	Benign	Total
Sonobreast result	Positive	94	81	175
	Negative	1	159	160
	Total	95	240	335

Parameters	Results	Methods
Sensibility	98,95%	Wilson points
Specificity	66,25%	Wilson points
Positive predictive value	53,71%	Wilson points
Negative predictive value	99,38%	Wilson points
Acuracy	75,52%	Wilson points

Figure 1 – Test parameters for 2 cm masses and smaller

For tumors bigger than 2 cm (n=219), the test had sensibility of 98,46%, specificity of 59,09%, PPV=50,39% and NPV=98.91 (figure 2 and table 2).

Table 2 - Bigger than 2 cm masses

		Nodule biopsy (gold standard)		
		Malignant	Benign	Total
Sonobreast result	Positive	64	63	127
	Negative	1	91	92
	Total	65	154	219

Parameters	Results	Methods
Sensibility	98,46%	Wilson points
Specificity	59,09%	Wilson points
Positive predictive value	50,39%	Wilson points
Negative predictive value	98,91%	Wilson points
Acuracy	70,78%	Wilson points

Figura 2 – Test parameters for masses bigger than 2 cm

When it comes to the test's accuracy, values were 75,52% for the smaller masses and 70,78% for the bigger ones. When we correlate Sonobreast's correct and incorrect results with the size of the tumor, it is evidenced by the Chi square test that the masses' size does not significantly influences the outcome, as the p-value found is 0,254 ($p > 0,05$) (Table 3).

Table 3 – Chi square test

		Nodule size		
		2 cm and smaller	Bigger than 2 cm	Total
Results	Correct	253	155	408
	Incorrect	82	64	146
	Total	335	219	554

p-value= 0,254 ($p > 0,05$)

Conclusion

Analysing the number of positive and negative results (according to the size category), it was evidenced that Sonobreast presents high sensibility for each of the categories. This characteristic is essential to a test with the purpose of sorting breast cancer, considering how damaging it would be to obtain a false-negative result. Undetected cases would result in postponed diagnosis, compromising the prognosis of the patient.

Besides that, we concluded the size of the tumor does not have a statistically significative influence in Sonobreast's results. In the Chi square Test performed, it becomes clear that any result obtained with the Sonobreast (either correct or incorrect) is not influenced by the fact that the tumor is bigger or smaller than 2cm. Therefore, Sonobreast is equally capable of detecting malignancy of tumors under the size of 2cm or over the size of 2cm, constituting an important asset to diagnose breast cancer in an early stage.

References

[1] **INCA: National Institute of Cancer**

[2] **Sonobreast: Predicting Individualized Probabilities of Malignancy in Solid Breast Masses with Echographic Expression –** Clécio Ênio Murta de Lucena et al.

Propedêutica em Mastologia- Clécio Ênio Murta de Lucena et al.