The diffusion sequence by magnetic resonance in the diagnosis of breast cancer: an analysis of accuracy

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Objective: The objective of this study was to evaluate the accuracy of diffusion-weighted magnetic resonance imaging in diagnosing breast cancer compared with breast biopsy. **Methodology:** Diagnostic accuracy study of qualitative cross--sectional analysis to perform breast magnetic resonance spectroscopy carried out on 215 women over 18 years of age who agreed to participate in the study. Data were verified using normalized QQ plot analysis and standardized residual histogram. The distribution of the patients' profile according to the biopsy result was tested using the chi-square test and Student's t-test. To evaluate the sensitivity and specificity of DWI (Diffusion), ROC curve analysis was performed using the biopsy result as the gold standard. Data were analyzed in SPSS, version 26.0. The significance level adopted was 5% (p<0.05). **Results:** Regarding restriction to the diffusion sequence (DWI), it was observed that 78.1% had restriction and 21.9% were without restriction, confirmed in the respective ADC maps at the values of b50, b400, and b800. After breast biopsies, it was observed that 74.4% of the results were positive for malignancy and 25.6% for benignity. The data revealed that 81.8% of biopsy results were benign for BI-RADS® 3 and 41.3% malignant for BI-RADS® 4, with 19.4% malignant for BI-RADS® 4A. Compared with biopsies, the result for breast lumps was significant, totaling 68.8% for malignancy. However, for cysts, the 30.9% benign result in biopsy results was significant. It is important to highlight that 94.4% of malignant results confirmed by biopsies showed diffusion restriction in exams confirmed with their respective ADC maps. To evaluate the accuracy of the diffusion-weighted sequence (DWI), ROC curve analysis was performed in comparison with breast biopsy. In the case of diffusion restriction (DWI), sensitivity was 0.94 and specificity was 0.69. **Conclusion:** The significance indicated in the data infers that the model was efficient in predicting breast diagnosis.

Keywords: accuracy; breast cancer; diffusion-weighted imaging.