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Evaluation of upper limb lymphedema using spectroscopic bioimpedance in a Brazilian population

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Objective: Upper limb lymphedema secondary to breast cancer treatment is a disabling, chronic, and often incurable sequel, resulting from lymphatic insufficiency. There are several methodologies for diagnosing lymphedema, such as volumetrics (considered the gold standard), perimetry (the method most used in clinical practice due to its ease of application), perometry, lymphoscintigraphy, and computed tomography, which are high-cost equipment and are not superior to other methods, and spectroscopic bioimpedance (BIS), which allows the early diagnosis of lymphedema. Early detection is related to lower costs in the treatment of this comorbidity and less impact on the quality of life of these women; however, there are still no studies using BIS to assess lymphedema in the Brazilian population. The aim of this study was to analyze the validity of BIS as a method for diagnosing lymphedema in Brazilian women undergoing treatment for breast cancer and compare it with other methods. **Methodology**: A cross-sectional prospective study was carried out at Hospital de Amor, evaluating 462 women undergoing treatment for breast cancer, from May 2015 to January 2021. Lymphedema was evaluated using different methodologies. BIS results were compared with direct volumetry. L-Dex® technology/BIS equipment from ImpediMed® was acquired using FAPESP grant under the number 2014 08197-0. The study was approved by the local ethics committee under the numbers 782/2014 and CAAE 28140214.1.0000.5437. **Results:** When comparing patients with lymphedema diagnosed by direct volumetry with those diagnosed by BIS, BIS did not diagnose lymphedema in 52 of the 93 patients with lymphedema. BIS sensitivity was 44.1%, specificity 95.4%, PPV was 70.7%, NPV was 87% and Kappa was 0.459. When performing the ROC curve between BIS and volumetry, a good area under the curve was obtained (AUC=0.75) and a possible cutoff point of L-Dex® ^{3}7.35 with a sensitivity of 57%, a specificity of 90.9%, and kappa value=0.489. **Conclusion:** BIS showed low sensitivity and concordance and did not prove to be a valid method for diagnosing lymphedema in Brazilian women.

Keywords: lymphedema; ROC curve; prospective study; breast neoplasms.