

Association of body composition measured by bioelectrical impedance analysis and hematologic adverse events in early-stage breast cancer patients receiving chemotherapy

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Background: The low muscular component is associated with diminished cancer treatment outcomes and increased toxicities. Various studies focused on advanced measurement techniques i.e. DEXA or CT-based analysis, while study on bioelectrical impedance analysis (BIA) was limited. This study examined the association of body composition by BIA on the hematologic adverse event in early-stage breast cancer (EBC).

Methods: A total of 144 female patients who had EBC were enrolled in this study. Body weight (BW) and fat-free mass (FFM) were measured by BIA analyzer before starting of the first cycle of chemotherapy. BW and FFM were converted into body mass index (BMI) and fat-free mass index (FFMI) by dividing with squared height (in meter) of the patient. The association between FFMI and composite adverse event (CAE), including grade 4 neutropenia and relative dose intensity < 85% were explored.

Results: From 144 cases, CAE occurs in 85 cases (59%), and point biserial correlation shows an inverse correlation between FFMI and CAE. Per the international consensus, none of these cases matched with sarcopenic criteria (FFMI <11.4 kg/sq.m). AUC analysis revealed FFMI of < 14.85 kg/sq.m should be the cutpoint for low FFMI. Using this cutpoint, 85 patients were classified as low FFMI, and 62 patients (72.9%) he CAE with a notable relative risk (RR) of 1.86 (p<0.001). After adjusting for other factors, low FFMI was significantly associated with a high CAE rate (adjusted OR 4.562, p<0.001).

Conclusions: Low FFMI significantly correlates with the CAE. The physician should be aware of greater chance of having adverse events in this group of patients, and the intensive nutritional advisory program may be essential to improve overall treatment outcomes. Finally, FFMI by BIA is a useful tool to detect patient-at-risk in this situation.