

BIO-IMPEDANCE TECHNIQUE TO DIAGNOSE SARCOPENIA IN FALLERS COMPARED TO DUAL X-RAY ABSORPTIOMETRY

Introduction: Sarcopenia is associated with adverse outcomes such as fragility fractures, disability and death. Diagnosing sarcopenia in fallers may allow earlier nutritional and exercise interventions that could potentially reduce such outcomes. Defining sarcopenia relies on measurements of muscle mass and function. MRI is the “gold standard” method of assessing muscle mass but its availability is restricted and dual-energy x-ray absorptiometry (DXA) is often used instead. Bio-impedance analysis (BIA) is an alternative quick and simple technique although its performance has not been investigated in this population. This study assessed the usefulness of BIA compared to DXA in diagnosing sarcopenia in fallers.

Methods: Consecutive patients referred to a falls unit were recruited. BIA (Tanita BC-418) and DXA (GE Lunar Prodigy Bone Densitometer) were used to measure muscle mass (skeletal muscle index (kg/m^2)). Functional measures of gait speed and grip strength were recorded. Sarcopenia was diagnosed using the European Working Group on Sarcopenia definition and appropriate sex-specific cut-offs. Prevalence of sarcopenia using BIA and DXA were compared with the latter considered the standard method.

Results: Forty nine patients (61.2%=women); mean age=79.8 years (range= 67-92) were recruited. Seven could not have BIA (pacemakers or unsteady) and ten could not undertake DXA (positional, tremors, in hospital or declined) leaving thirty-two with both techniques performed. Mean muscle mass (SD, kg/m^2) for men and women were 7.73 (0.98) and 6.98 (1.03) for BIA and 7.81 (0.94) and 6.23 (1.08) for DXA respectively. Pearson’s correlation between BIA and DXA was 0.61 ($p < 0.001$). Prevalence of sarcopenia using BIA and DXA were 37.5 % (n=12) and 12.5% (n=4) respectively. Sensitivity and specificity of BIA in diagnosing sarcopenia were 75.0% and 67.9% respectively with positive and negative predictive values being 25% and 95% respectively.

Discussion: BIA was a quick and simple technique used in the falls unit, although it over diagnosed sarcopenia compared to DXA. However the high negative predictive value means it can screen out those without sarcopenia and could therefore be usefully employed to reduce the number of DXA referrals. Oedema and hydration levels may reduce correlation between the two techniques which requires further study.