THE RELATIONSHIP BETWEEN BIA- AND CT-DERIVED MUSCLE MASS IN CRITICALLY ILL PATIENTS

Wilhelmus G. Looijaard1, Sandra N. Stapel1, Sharon Remmelzwaal1, Ingeborg M. Dekker1,2, Peter J. Weijs1,2,3, Heleen M. Oudemans-van Straaten1

1Department of Intensive Care Medicine, 2Department of Nutrition and Dietetics, VU University Medical Center, 3Department of Nutrition and Dietetics, Amsterdam University of Applied Sciences, Amsterdam, Netherlands

Presentation Method: Oral or Poster presentation

Please indicate your professional occupation: Physician

The presenting author fulfills the above conditions and wants to apply for a travel award: Yes

I confirm that the presenting author is under the age of 35: Yes

Rationale: Muscle wasting is a devastating complication of critical illness. Recently, we found that muscle area derived from CT-scans1 and muscle mass from bio-impedance analysis (BIA)2 are related to mortality. Both methods have their limitations. Aim of this study was to determine the relationship between CT- and BIA-derived muscle mass.

Methods: This prospective observational study included adult intensive care patients. BIA was performed ≤4 days after an abdominal CT-scan was made for clinical reasons. CT-scans were analysed using Slice-O-matic software and BIA was performed using an AKERN BIA device (phase sensitive 50 kHz). We calculated Pearson’s ρ correlation coefficient. Muscle area (cm²) was converted to muscle mass (kg)3 to calculate bias and limits of agreement (LoA). Finally, sensitivity and specificity for BIA to detect low muscle mass were calculated using recently published CT cut-off values1.

Results: 84 patients were included (58 male), mean age was 62±15 years. CT-scans were made 1.15±3.7 days after ICU admission and BIA was performed 0.86±0.9 days later. Mean BIA-derived muscle mass was 35.4±10.1kg and CT-derived muscle mass was 28.3±6.2kg. BIA-derived muscle mass and CT-derived muscle area were highly correlated (ρ=0.84, p<0.001). The mean difference (bias) between BIA and CT was 7.05±6.0kg, LoA 18.8 and -4.7kg. Bias increased at higher muscle mass. BIA and CT identified the same patients as having low muscle mass with a sensitivity of 83% and a specificity of 84%.

Conclusion: This study shows that BIA- and CT-derived muscle mass are highly correlated and identify the same at-risk patients. We found a proportional bias with higher muscle mass using BIA compared to CT. Further research is needed to analyse this discrepancy. However, our findings indicate BIA is a promising method to assess muscle mass without practical issues concerning CT-scanning.


Disclosure of Interest: None Declared

Keywords: Critically ill patients, Muscle mass