COMPARISON OF SINGLE AND MULTIFREQUENCY BIOELECTRICAL IMPEDANCE ANALYSIS WITH DUAL-ENERGY X-RAY ABSORPTIOMETRY FOR THE ASSESSMENT OF BODY FAT AND LEAN MASS IN PATIENTS ON MAINTENANCE HEMODIALYSIS

Suellen C. Alves Nogueira[1], Karina Jesus Antonio[1], Barbara Perez Vogt[2], Jacqueline C. Teixeira Caramori[2]

[1]Instituto de Biociências de Botucatu [2] Internal Medicine Departament, Dialysis Unit, Faculdade de Medicina de Botucatu, UNESP Univ Estadual Paulista, Campus Botucatu, BRAZIL.

1. INTRODUCTION

Evaluation of body composition in hemodialysis patients is of paramount importance since studies have demonstrated the association of protein energy wasting with an increased risk of morbidity and mortality in this population. It is important to identify a technique for assessing body composition that is simple, non-invasive, cost-effective and could be routinely used in clinical setting..

2. OBJECTIVE

To evaluate single and multifrequency bioelectrical impedance analysis (BIA) with dual-energy X-ray absorptiometry (DXA) as a reference method, for the assessment of body fat and lean mass in patients on maintenance hemodialysis.

3. MATERIALS AND METHODS

- Cross sectional study
- Prevalent hemodialysis patients
- Demographic characteristics, clinical data and laboratory measurements (serum urea, creatinine, albumin, CRP)
- Single and multifrequency BIA:
  - Body fat (BF) and free fat mass (FFM)
- DXA (reference method):
  - BF and lean mass (LM)
- **Statistical analysis**
  - ANOVA and Tukey
  - $p < 0,05$
  - Bland & Altman concordance method

4. RESULTS

Main characteristics of patients

Variables	All (n=41)
Gender [M(%)]	21 (51.2)
Age (years)	59.8 ± 16.2
Dialysis vintage (months)	31 (2, 235)
Diabetes (%)	15 (36.6)
BMI (kg/m²)	25.6 ± 4.6
Serum Urea (mg/dl)	110 ± 28
Serum Creatinine (mg/dl)	9.4 ± 3
Albumin (g/dl)	4 ± 0.4
CRP (mg/dl)	1 (0.5, 5.5)

Comparison between the methods

	Body fat (kg)	Free fat mass (BIA) / Lean mass (DXA) (kg)
DXA (kg)	19.9 ± 9.2	40.5 ± 8.8
Single frequency BIA (kg)	23.5 ± 7.7	42.5 ± 8.8
Concordance interval [single frequency BIA x DXA (kg)]	-4.3 – 9.6	-23 – 27.1
Multifrequency BIA (kg)	25.7 ± 9.5#	31.4 ± 8.1*#
Concordance interval [multifrequency BIA x DXA (kg)]	-2 – 11.7	-22.4 – 4.4

* p<0.05 when compared to single frequency BIA, # p<0.05 when compared to DXA

Bland & Altman plots

Body fat: Single frequency BIA x DXA

Fat free mass: Single frequency BIA x DXA

Body fat : Multifrequency BIA x DXA

Fat free mass: Multifrequency BIA x DXA
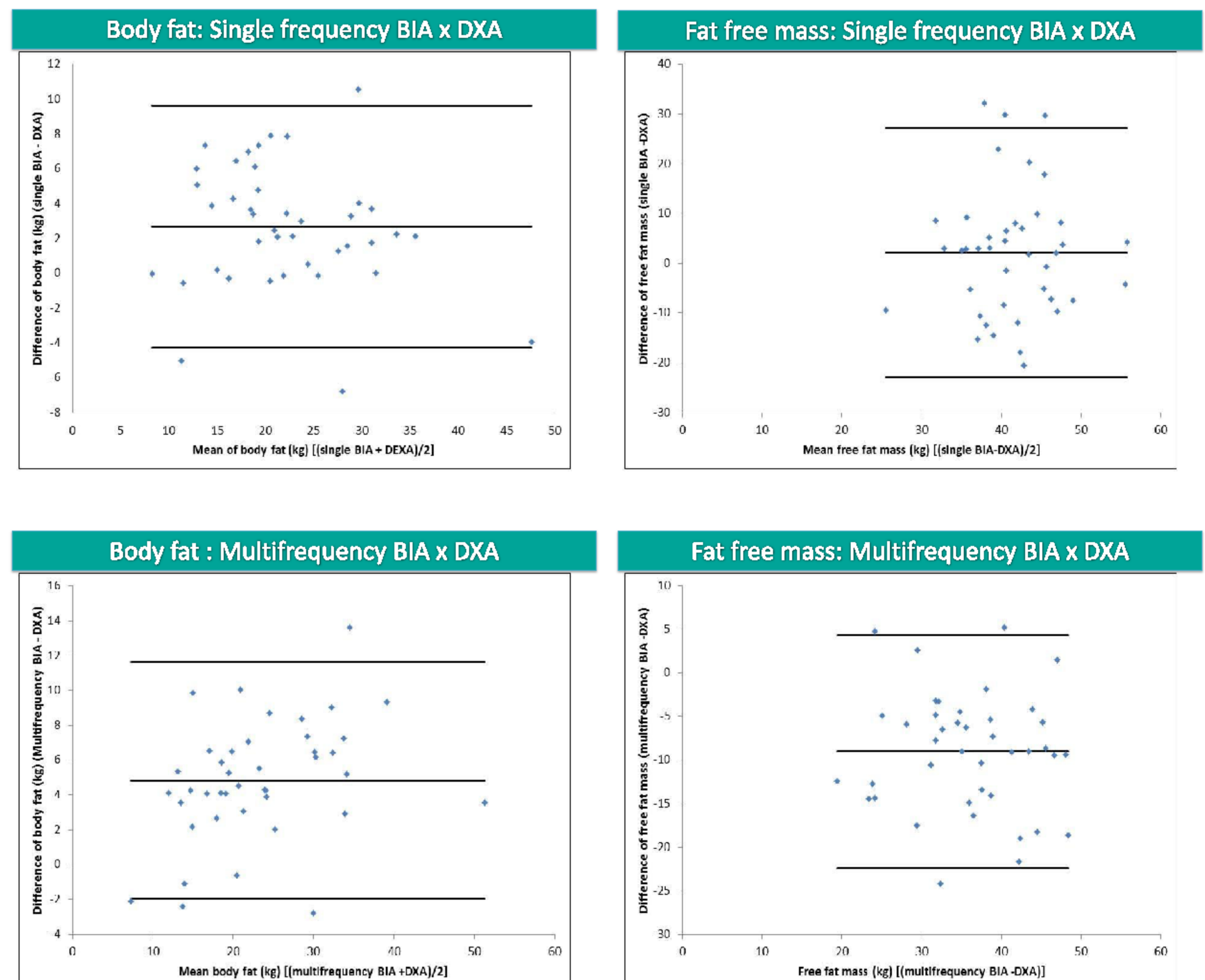
5. CONCLUSION

Single and multifrequency BIA showed a low level of concordance with DXA, therefore, they are not reliable methods to evaluate body composition in patients on maintenance hemodialysis.