

Comparison of a biomedical spectroscopic electrical impedance analysis with the measures of four clinical muscle performance to detect sarcopenia for the old patients.

Rivier E, MD *, Gauthier T, MD *, Pfister JA, MD *, Maillard AB, MD *, Cosnier R †, Piessevaux I †, Preiswerk S †, Quinet P †, Yersin N †, Glauser C †, Lamotte P †, Renaudin E †, Krieg S ‡, Blanc M ‡, Maspero A °

* Centre de traitement et de réadaptation-Riviera (CTR-R), Blonay, Switzerland

† Service de physiothérapie et d'ergothérapie, CTR-R, Blonay, Switzerland

‡ Service de diététique, CTR-R, Blonay, Switzerland

° Division autonome de neuropsychologie, CHUV, Lausanne, Switzerland

Background

Sarcopenia refers to the loss of skeletal muscle mass and to the decline in muscular performance in aging¹ and is considered as one of the five criteria to define frailty in Older Adults². The use of the bioelectrical impedance analysis is one of the ways to evaluate the skeletal muscle mass but to our knowledge the correlation between muscle mass and muscle performance is not well established.

Purpose

Primary outcome: to look for a correlation between 4 clinical muscle performances (Grip Strength, Key Pinch, Tip Pinch³, Ten Meters Walk Test⁴) and the lean mass index (LMI) measured by the Biomedical Spectroscopic Electrical Impedance (BSEI) analysis⁵.

Secondary outcome: to detect a threshold of the LMI, which could characterise the probability to go back home.

Patients and methods

18 patients (11 women, 7 men, mean age 82 years) admitted in our rehabilitation hospital during February and June 2009. Exclusion criteria: terminal diseases, major motor difficulties (score of =5 for the ambulation and transfer evaluated by the Barthel Index⁶), severe to very severe dementia, cardiac, hepatic or kidney insufficiency with oedema, patients with coronary stents or pace maker.

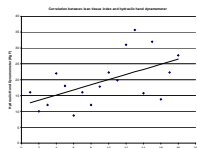
The enrolled patients have signed a formal consent.

R has been calculated through the Pearson formula.

Results:

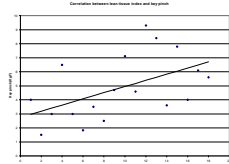
Primary outcome:

Lean mass index and ...



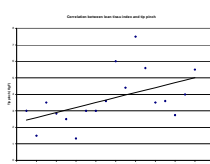
Grip strength test.

R = 0.238, p=0.353



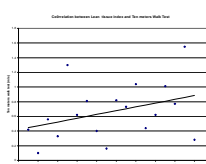
Key pinch test.

R = 0.254, p=0.310



Tip pinch test. R = 0.219,

p=0.382



Ten meters walk test. R =

0.622, p=0.006

Secondary outcome: 17 patients go back to one's home, one is dead. No threshold can be detected.

Discussion: we have looked for a linear correlation (Pearson) between the LMI measured by BSEI and 4 clinical muscle performances. A statistically significant correlation has been found between the ten meters walk test and the LMI. No statistically significant correlation can be shown for the grip test and the two pinch tests. But more patients need to be integrated in the study. We have not been able to detect a threshold which may predict the capacity to go back home, indeed the 18 patients have gone back to one's home.

References

1. Rolland Y, Vellas B. La sarcopénie. La Revue de Médecine Interne 2009.
2. Fried LP, Tangen CM, Walston J et al. Frailty in Older Adults: Evidence for a Phenotype. Journal of Gerontology 2001; 56A:M146-M156
3. Mathiowetz V, Weber K, Volland G et al. Reliability and validity of grip and pinch strength evaluation. J.Hand Surgery 1984;9A:22-26.
4. Montero-Odasso M, Schapira M, Soriano ER et al. Gait Velocity as a Single Predictor of Adverse Events in Health Seniors Aged 75 years and Older. J of Gerontology 2005; 60:1304-1309.
5. BCM – Body Composition Monitor. Technology & Literature Review.
6. Mahoney FI, Barthel DW. Md State Med J 1965;14:62-65

Author's email adress
erivier@bluewin.ch

