

## DXA, BIA, anthropometry and skinfolds methodology in body composition

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### Background

Body composition is a strong indicator of nutritional and health status. Dual energy X-ray absorptiometry (DXA), multifrequency bioelectrical impedance analysis (BIA), anthropometry and, skinfolds are non invasive methods to assess body composition with different levels of reliability. The validity of anthropometric and skinfolds to estimate body composition in Huntington Disease (HD) is still controversial.

### Aims

To determine and compare body composition according to DXA, BIA, anthropometry and, skinfolds estimates in HD.

### Methods

Cross-sectional, multicenter and, national study. 20 genetically confirmed HD patients and, 10 gender gender-aged paired controls. Body composition was assessed under standardized conditions using the DXA (Prodigy of General Electric Healthcare); and BIA (Body Composition Analyzer Seca mBCA 525).

Skinfold thicknesses were measured by Holtain skinfold caliper (Image N<sup>o</sup>1).



Image N<sup>o</sup>1.- Skinfold thickness caliper

Circumferences at waist, hip, calf, arm were measured using soft non stretchable tape Seca and, weight and height by Seca brand electronic scale with height rod (Image N<sup>o</sup>2).

To analyze the accuracy of BIA, anthropometrics, and skin folds against DXA, correlations and receiver operating curve analysis will be performed.

### Results

Whereas DXA is a method where is necessary to have technical staff and qualified in the handling of X-rays equipment, rarely used in routine clinical practice. BIA has limitations due to the chemical composition of fat free mass because of considerable inter- and intraindividual variability.

The accuracy of BIA measurements is high when specific predictive equations and standardized measurement protocols are utilized (Image N<sup>o</sup>2).

Anthropometry and skinfolds are very-low cost, accesible to health personnel in routine clinical practice, with good sensitivity and specificity in the adult, healthy population. The results of this study will be presented.



Image N<sup>o</sup>2.- Brand electronic scale with height rod (left), and measuring mat and electrode cables of bioimpedance analysis with the patient in a lying position.

### Conclusions

The results will help to estimate body composition with low-cost methods easy to use to prevent malnutrition and sarcopenia in HD.

### References

- 1.- Shepherd JA, Ng BK, Sommer MJ, Heymsfield SB. Body composition by DXA. Bone. 2017 Nov;104:101-105. doi: 10.1016/j.bone.2017.06.010
- 2.- Borga M, West J, Bell JD, Harvey NC, Romu T, Heymsfield SB, Dahlqvist Leinhard O. Advanced body composition assessment: from body mass index to body composition profiling. J Investig Med. 2018 Jun;66(5):1-9. doi: 10.1136/jim-2018-000722