

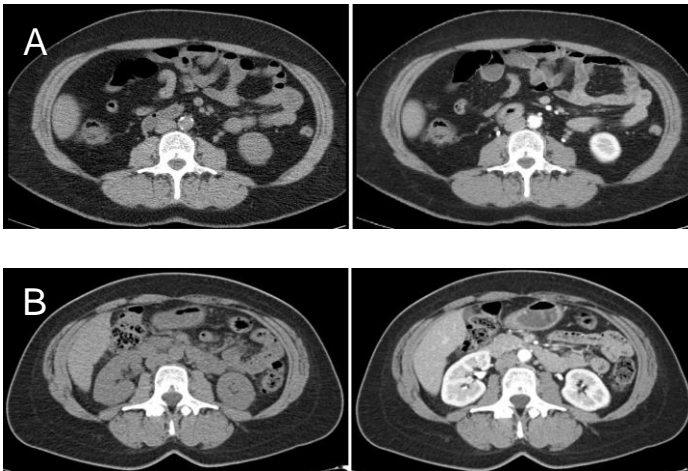
Skeletal muscle: agreement between non-contrast and contrast CT scan measurements

A van der Werf^{1,2}, IM Dekker¹, N.J. Wierdsma¹, MAE de van der Schueren¹, JAE Langius¹

¹Department of Nutrition and Dietetics, Internal Medicine, ²Medical Oncology
VU University Medical Center, Amsterdam, The Netherlands

Rationale

Low skeletal muscle area (SMA) and mean muscle attenuation (MMA) have been associated with poor prognosis in various patient populations. To determine SMA and MMA, both non-contrast and contrast CT scans are used. The effect of the use of a contrast agent on SMA and MMA is unknown. Therefore, we investigated agreement between these two scan options.



A: paired 100 kV non-contrast (left) and 120 kV (right) contrast scan
B: paired 120 kV non-contrast (left) and 120 kV (right) contrast scan

Methods

SMA and MMA of 41 healthy individuals were analyzed on a paired non-contrast and contrast single L3 CT slice, which were selected on the basis of similarity by two researchers independently. Agreement between results of both scans was assessed with use of Bland Altman plots and intraclass correlation coefficients (ICCs). Results were stratified for tube voltage: different tube voltage (non-contrast 100 kV and contrast 120 kV) and same tube voltage (both non-contrast and contrast 120 kV).

Conclusion

SMA and MMA can be slightly influenced by the use of contrast agent. To minimize measurement error, image acquisition (use of contrast agent, tube voltage) of the scans should be similar and be reported.

Results

SMA measured on a paired non-contrast and contrast CT-slice differed significantly, with higher values for contrast scans than for non-contrast scans:

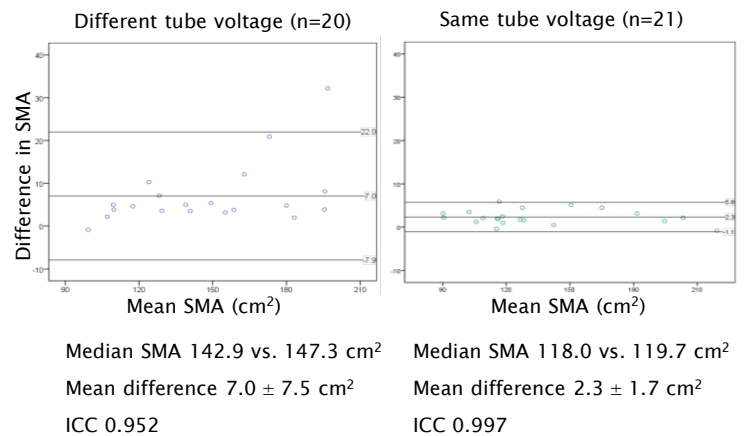


Figure 1: Non-contrast and contrast measurements: SMA

MMA results of paired non-contrast and contrast CT-slices differed more between of scans made with the same tube than scans made with a different tube voltage. Although the mean difference in MMA was higher, limits of agreement were smaller, corresponding to higher agreement.

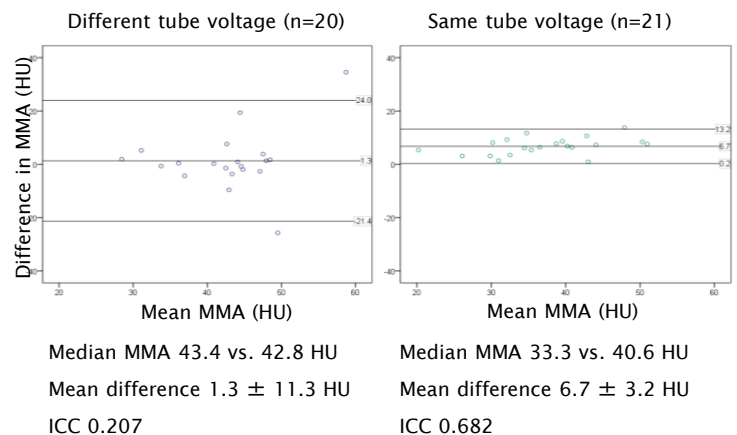


Figure 2: Non-contrast and contrast measurements: MMA