



Correct determination of abdominal fat accumulation

To the Editor,

We read with great interest the article by Lee et al. (1) who reported relationship between colonic diverticulosis and abdominal fat mass. While we considered the results presented particularly important, we also wanted to highlight some methodological issues limiting correct interpretation of the published data.

Body composition determination with single slice computed tomography (CT) image analysis that was used in study by Lee et al. (1) has increasingly been popular. This modality relies on determination of lipid and muscle mass by quantitative analysis of predefined CT slice through attenuation value of tissues. In the current work, image analysis was performed at the level of umbilicus (between the fourth and fifth lumbar disc position). Use of predefined and validated anatomic points to calculate body composition is critical due to the fact that distribution of fat mass is not similar in abdominal regions. However, the validity of the single slice CT image analysis at umbilicus level to determine total abdominal lipid mass was not addressed by Lee et al. (1). The value of single slice CT analysis at umbilicus to accurately predict abdominal lipid mass is not evidence based. Also, attenuation values which were predefined as -190 and -30 Hounsfield unit in the study by Lee et al. seems relatively wide (2). Thus, body components out of lipid mass may easily classified as lipid within this wide range. Moreover, to date, validity of single slice CT analysis to predict body composition has only been tested against a non-gold standard modality, Dual-energy X-ray absorptiometry (3,4). Before reaching definitive conclusions from the results presented by the authors, we believe their hypothesis needs to be verified with gold standard body composition analysis techniques.

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Author's Reply

To the Editor,

We sincerely appreciate your interest and comments on our paper published in April 2014 issue of this journal. We see your point that it is required to evaluate validity for the body composition determination with single slice computed tomography image. However, it should be carefully noted and highly emphasized that our study was designed based on a previous study (1). In that study, subcutaneous and visceral fat areas were measured on one cross-sectional scan obtained at the umbilicus level (between the fourth and fifth lumbar disc position), and since then, this measurement has become the most commonly used methodology in many relevant studies.

As you mentioned, however, a recent study on the measurement of body fat indicates that the optimal level in CT images for estimating subcutaneous and visceral adipose tissues are not located on the same plane in different individuals and therefore, using multiple slices CT images may improve the accuracy (2). However, we do not think that the evidence from the recent study is enough to replace the current method (3) and thus believe that further studies are needed in terms of the methodology.

In addition, the attenuation range (from -190 to -30 Hounsfield units as the standard of reference) of adipose tissue in our study was determined according to what was defined by previous studies (1,4,5). And, in our study, it was actually not difficult to measure adipose tissue areas using this method. Although many efforts to determine the proper level in CT images have

continued, the values of attenuation range and the location for estimating adipose tissue have shown somewhat different results among studies up until now. Therefore, in conclusion, despite of these methodological limitations, we firmly believe that this study will be quite helpful in understanding the association between colonic diverticular disease and abdominal obesity.

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