

Muscle Mass Index Revisited



To the Editor:

It was with great interest that I read the article by Srikanthan and Karlamangla,¹ who suggested that high muscle mass index (MMI) was associated with lower mortality. Readers are cautioned on the implications of their findings, noting some limitations to their methodologies.

Quartiles of MMI were created on an older, although not entirely elderly, cohort. While muscle mass and quality do decrease with age, the decline accelerates in the seventh decade, with rates ranging between 7.5% and 58.3%.² Quartile stratification is an appropriate approach that assists in the head-to-head comparison with other anthropometric measurements. However, their approach differs from that used in other diseases, including osteoporosis, whose cutoffs are based on a younger, healthier population. The quartile cut points presented are based on a referent population that itself has lower muscle mass to begin with, leading to narrower ranges within categories. Whether the differences between adjacent MMI quartiles provide adequate discrimination with changes in function, disability, or mortality, remain unclear. Methodologically, quartile cutoffs based on the entire population or a younger cohort would provide better representation of true mortality estimates.

Muscle strength may indeed be more important than muscle mass.³ While the authors recognize this phenomenon, a recent meta-analysis demonstrates even more reliable associations with strength than mass. Further, appendicular lean mass is associated with functional decline in longitudinal studies⁴ and should be considered in lieu of total fat-free mass. Recent guidelines recommend this measure,⁵

even after adjusting for body mass index. Accurate body composition assessment with physiologic muscle parameters is urgently needed for incorporation into clinical practice.⁶ Readers are cautioned that MMI may not be an ideal indicator as compared with muscle strength or appendicular lean mass, and that the capacity to live independently with maintained function may supercede mortality as an important geriatric outcome.

John A. Batsis, MD

Section of General Internal Medicine
 Dartmouth-Hitchcock Medical Center
 Lebanon, New Hampshire
 Geisel School of Medicine at Dartmouth
 Hanover, New Hampshire
 Dartmouth Center for Health and Aging
 Dartmouth College
 Hanover, New Hampshire

<http://dx.doi.org/10.1016/j.amjmed.2014.07.013>

References

1. Srikanthan P, Karlamangla AS. Muscle mass index as a predictor of longevity in older adults. *Am J Med.* 2014;127:547-553.
2. Batsis JA, Barre LK, Mackenzie TA, Pratt SI, Lopez-Jimenez F, Bartels SJ. Variation in the prevalence of sarcopenia and sarcopenic obesity in older adults associated with different research definitions: dual-energy X-ray absorptiometry data from the National Health and Nutrition Examination Survey 1999-2004. *J Am Geriatr Soc.* 2013; 61:974-980.
3. Schaap LA, Koster A, Visser M. Adiposity, muscle mass, and muscle strength in relation to functional decline in older persons. *Epidemiol Rev.* 2012 Dec 4 [Epub ahead of print].
4. Cesari M, Pahor M, Lauretani F, et al. Skeletal muscle and mortality results from the InCHIANTI Study. *J Gerontol A Biol Sci Med Sci.* 2009;64:377-384.
5. Studenski SA, Peters KW, Alley DE, et al. The FNIH sarcopenia project: rationale, study description, conference recommendations, and final estimates. *J Gerontol A Biol Sci Med Sci.* 2014;69:547-558.
6. Batsis JA, Sahakyan KR, Rodriguez-Escudero JP, Bartels SJ, Lopez-Jimenez F. Normal weight obesity and functional outcomes in older adults. *Eur J Intern Med.* 2014;25:517-522.

Funding: Supported by the Department of Medicine and the Dartmouth Centers for Health and Aging.

Conflict of Interest: None.

Authorship: The author is solely responsible for writing this manuscript.