



Answer to the Letter to the Editor of V. B. Safer et al. concerning “Analysis of skeletal muscle mass in women over 40 with degenerative lumbar scoliosis” by Eguchi Y et al. (Eur Spine J; 2018: doi:10.1007/s00586-018-5845-0)

Yawara Eguchi¹ · Toru Toyoguchi² · Kazuhide Inage³ · Kazuki Fujimoto³ · Sumihisa Orita³ · Miyako Suzuki³ · Hirohito Kanamoto³ · Koki Abe³ · Masaki Norimoto³ · Tomotaka Umimura³ · Takashi Sato³ · Masao Koda³ · Takeo Furuya³ · Yasuchika Aoki⁴ · Junichi Nakamura³ · Tsutomu Akazawa⁵ · Kazuhisa Takahashi³ · Seiji Ohtori³

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We are truly grateful for the opportunity to respond to this Letter to the Editor concerning our recently published study entitled “Analysis of skeletal muscle mass in women over 40 with degenerative lumbar scoliosis” [1]. First, we thank the authors for their interest in our work and for the opportunity to further explain our body composition analysis using the

bioelectrical impedance analysis (BIA) and the classification of sarcopenia. BIA measures tissue impedance by circulating a weak alternating current through the hydrated tissues of the body [2]. Measurement of appendicular skeletal muscle mass (ASMM) using dual-energy X-ray absorptiometry (DXA) is considered to be the gold standard for the diagnosis

✉ Yawara Eguchi
yawara_eguchi@yahoo.co.jp

Toru Toyoguchi
vzm04035@nifty.ne.jp

Kazuhide Inage
kazuhideinage@yahoo.co.jp

Kazuki Fujimoto
s9082@nms.ac.jp

Sumihisa Orita
sorita@chiba-u.jp

Miyako Suzuki
miyako_rush634@yahoo.co.jp

Hirohito Kanamoto
tukito_taiyou_emod@yahoo.co.jp

Koki Abe
abeabeabe04@yahoo.co.jp

Masaki Norimoto
soundsleep.mn@gmail.com

Tomotaka Umimura
adna4547@gmail.com

Takashi Sato
jozankei@me.com

Masao Koda
masaokod@gmail.com

Takeo Furuya
furuya-takeo@chiba-u.jp

Yasuchika Aoki
yasuaoki35@fc4.so-net.ne.jp

Junichi Nakamura
njonedr@yahoo.co.jp

Tsutomu Akazawa
cds00350@par.odn.ne.jp

Kazuhisa Takahashi
19501114@faculty.chiba-u.jp

Seiji Ohtori
sohtori@faculty.chiba-u.jp

- 1 Department of Orthopaedic Surgery, Shimoshizu National Hospital, 934-5, Shikawatashi, Yotsukaido, Chiba 284-0003, Japan
- 2 Department of Orthopaedic Surgery, Chiba Qiball Clinic, 4-5-1, Chuo-ku, Chiba 260-0013, Japan
- 3 Department of Orthopaedic Surgery, Graduate School of Medicine, Chiba University, 1-8-1 Inohana, Chuo-ku, Chiba 260-8670, Japan
- 4 Department of Orthopaedic Surgery, Eastern Chiba Medical Center, 3-6-2, Okayamadai, Togane, Chiba 283-8686, Japan
- 5 Department of Orthopaedic Surgery, St. Marianna University School of Medicine, 2-16-1, Sugao, Miyamae-ku, Kawasaki, Kanagawa, Japan

of sarcopenia [3]. BIA has a tendency to overestimate muscle mass compared to DXA, but a high correlation between BIA- and DXA-based measurements of ASMM was demonstrated for both male and female patients with low back pain ($r=0.88$ in males and $r=0.73$ in females, $p<0.0001$) [4]. Therefore, BIA may provide a simpler and cost-effective alternative to DXA for the screening of sarcopenia.

In accordance with the European Working Group on Sarcopenia in Older People (EWGSOP) and the Asian Working Group for Sarcopenia (AWGS) consensus, sarcopenia was defined as low muscle mass plus low muscle strength and/or low physical performance [5, 6]. We did not appraise certain qualities of muscle tissue such as functionality and strength. We agree that the latter may be more relevant to classify the subjects as presarcopenic rather than sarcopenic. At times, there is a more rapid decline in muscle strength relative to muscle mass. Further studies should address the involvement of decreased muscle qualities and the development of degenerative lumbar scoliosis.

Compliance with ethical standards

Conflict of interest The authors have no conflicts of interest to disclose.

References

1. Eguchi Y, Toyoguchi T, Inage K, Fujimoto K, Orita S, Suzuki M, Kanamoto H, Abe K, Norimoto M, Umimura T, Sato T, Koda M, Furuya T, Aoki Y, Nakamura J, Akazawa T, Takahashi K, Ohtori S (2018) Analysis of skeletal muscle mass in women over 40 with degenerative lumbar scoliosis. *Eur Spine J*. <https://doi.org/10.1007/s00586-018-5845-0>
2. Ward LC (2012) Segmental bioelectrical impedance analysis: an update. *Curr Opin Clin Nutr Metab Care* 15:424–429
3. Baumgartner RN, Koehler KM, Gallagher D, Romero L, Heymsfield SB, Ross RR, Garry PJ, Lindeman RD (1998) Epidemiology of sarcopenia among the elderly in New Mexico. *Am J Epidemiol* 147(8):755–763
4. Fujimoto K, Inage K, Eguchi Y, Orita S, Suzuki M, Kubota G, Sainoh T, Sato J, Shiga Y, Abe K, Kanamoto H, Inoue M, Kinoshita H, Norimoto M, Umimura T, Koda M, Furuya T, Akazawa T, Toyoguchi T, Terakado A, Takahashi K, Ohtori S (2018) Use of bioelectrical impedance analysis for the measurement of appendicular skeletal muscle mass/whole fat mass and its relevance in assessing osteoporosis among patients with low back pain: a comparative analysis using dual X-ray absorptiometry. *Asian Spine J* 12(5):839–845
5. Cruz-Jentoft AJ, Baeyens JP, Bauer JM, Boirie Y, Cederholm T, Landi F, Martin FC, Michel JP, Rolland Y, Schneider SM, Topinková E, Vandewoude M, Zamboni M (2010) European Working Group on Sarcopenia in Older People. Sarcopenia: European consensus on definition and diagnosis: report of the European Working Group on Sarcopenia in Older People. *Age Ageing* 39:412–423
6. Chen LK, Liu LK, Woo J, Assantachai P, Auyeung TW, Bahyah KS, Chou MY, Chen LY, Hsu PS, Krairit O, Lee JS, Lee WJ, Lee Y, Liang CK, Limpawattana P, Lin CS, Peng LN, Satake S, Suzuki T, Won CW, Wu CH, Wu SN, Zhang T, Zeng P, Akishita M, Arai H (2014) Sarcopenia in Asia: consensus report of the Asian Working Group for Sarcopenia. *J Am Med Dir Assoc* 15:95–101