

LETTER TO THE EDITOR

T.W. Auyeung¹, H. Arai², L.K. Chen³, J. Woo⁴, *1. Department of Medicine and Geriatrics, Pok Oi Hospital, Hong Kong; 2. National Center for Geriatrics and Gerontology, Japan; 3. Aging and Health Research Center, National Yang Ming University, Taiwan; 4. Department of Medicine & Therapeutics, The Chinese University of Hong Kong. Corresponding author: T.W. Auyeung, Department of Medicine and Geriatrics, Pok Oi Hospital, Hong Kong, auyeungtw@gmail.com*

NORMATIVE DATA OF HANDGRIP STRENGTH IN 26344 OLDER ADULTS – A POOLED DATASET FROM EIGHT COHORTS IN ASIA

Dear Editor,

In 2014, the Asian Working Group for Sarcopenia (AWGS) published the first consensus report for the diagnosis of sarcopenia in Asian people (1). Because of the lack of reference handgrip strength value based on adverse health outcomes, AWGS at that time recommended to use the lowest quintile of the study population as the cutoff values for low muscle strength, i.e., <26kg in men and < 18 kg in women (1). However, it was primarily based on 2 studies in Asia, one in Japan and the other one in Taiwan (2, 3). The agreed values were not generated from a wide representation in Asia and the sample size might not be sufficient. In 2019, AWGS started to revise the consensus report. In the first working group meeting in Nagoya, Japan, we decided to divide the members into subgroups, each responsible for literature review in one specific aspect about sarcopenia. The subgroups include: diagnostic algorithm, epidemiology of sarcopenia in Asia, muscle mass measurement, muscle strength measurement, physical performance tests, case finding in community and clinical settings. In the follow up second working group meeting held in May 2019 in Hong Kong, the muscle strength subgroup observed that most if not all of the published reports in Asia were employing handgrip strength to measure muscle strength. Therefore, we agreed to recommend using handgrip strength to measure muscle strength in the Asian older population. In addition, it is noted that there exists ethnic and geographical variations in muscle mass, muscle strength and physical performance measures (4). In the meeting, we learnt that a lot of population-based studies in Asia are still on-going, but may not have published their normative data yet. Therefore, we decided to revisit the Asian cutoff values of handgrip strength by collecting published and unpublished data obtained from community-based cohorts in East and Southeast Asia.

With the understanding of the variations in the measurement method of handgrip strength in different cohorts, we intended to harmonize the data as much as possible by standardizing the way of data presentation on submission. We included population data from age 60 years or above, with specification of the model of dynamometer and the measurement posture. We took only the maximum hand grip strength of at least 2 trials. The reason we included 60 years and not just 65 years

or above is that the definition of the older population in Asia varies. In some countries because of the shorter life expectancy, it is defined as 60 years and above. Moreover, we took this opportunity to classify our data according to different age-strata so that the researchers in Asia can take reference to these cutoff values flexibly to define weak muscle strength. To be consistent with the methodology of the 2014 AWGS consensus report, we continue to adopt the population aged 65 years or above as the reference older population. Furthermore, we understand that the EWGSOP (5) uses -2.5 standard deviations (SD) of the general adult population as the cutoff values to define weak handgrip strength. However, again to comply with the methodology in 2014, we continue to employ the lowest quintile of the older population as the cutoff values.

Table 1
Description of the seven cohorts in Asia

Cohorts	Number of participants	Percentage (%)
Korea	7128	27.1
Japan	4865	18.5
Singapore	195	0.7
Taiwan (ILAS)	783	3.0
Thailand	7128	27.1
China	815	3.1
Taiwan (LAST)	1430	5.4
Hong Kong	4000	15.2
Total	26344	100.0

ILAS = I Lan Longitudinal Aging Study; LAST = Longitudinal Aging Study of Taipei

By the end of June 2019, we collected data from 8 cohorts in Asia, comprising 26,344 older participants of aged 60 years or above. (Table 1) For dynamometer model, either Smedley (81.0%) or Jamar (19.0%) was used. Men constitute 46.3% of the whole pooled dataset and the mean handgrip strength was 34.1kg (SD = 7.1kg) in men and 21.9kg (SD = 4.8kg) in women. In addition, the lowest quintiles in older adults aged 65 years or above were 28.0 kg and 17.7 kg in men and women, respectively. (Table 2) It is noteworthy that these quintiles

NORMATIVE DATA OF HANDGRIP STRENGTH IN 26344 OLDER ADULTS

are close to the mean of the 80 year or above age-stratum, supporting the face validity of these cutoff values though they are not based on adverse health outcomes. (Table 2) Furthermore, the cutoff values of our pooled dataset are higher than those proposed by the EWGSOP2 (defined as below -2.5 SD of adult population, or 27 kg and 16 kg in men and women, respectively). However, they are not strictly comparable as they employed different methodology in the definition of the cutoff values (1, 5). Moreover, these age-specific reference values can also be applied as targets for an older individual practicing muscle strengthening. They can target at a level from on-par with their age group to a level even younger than their chronological age in a stepwise approach.

Table 2
Overall and age-specific percentiles and means of handgrip strength

Age stratum (years)	Lowest quintile (kg)	Mean (SD) (kg)
Men		
60 – 69.9	32.7	37.9 (6.5)
N = 5319		
70 – 79.9	28.0	33.3 (6.3)
N = 5317		
80 or above	23.6	28.4 (6.2)
N= 1554		
60 or above	28.9	34.7 (7.1)
N= 12190		
65 or above	28.0	33.8 (6.9)
N = 10273		
Women		
60 – 69.9	20.0	23.6 (4.6)
N = 6384		
70 – 79.9	17.8	21.1 (4.5)
N = 6009		
80 or above	14.7	18.3 (4.5)
N= 1761		
60 or above	18.0	21.9 (4.8)
N = 14154		
65 or above	17.7	21.3 (4.8)
N = 11711		

SD = Standard deviation

With this pooled dataset from various countries in Asia, the cutoff values of handgrip strength for sarcopenia will be revisited and subjected to further deliberation, with reference to the updated lowest quintile in the older population (men 28.0 kg and women 17.7 kg), before being revised in the second AWGS consensus report in 2019.

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