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Diagnosis and evaluation of sarcopenic obesity

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Sarcopenia is primarily an age-related skeletal muscle disorder. Earlier defined by reduced muscle mass, its definition, shaped by various expert consensus groups, has evolved to include decreased muscle strength and impaired physical function as well. Obesity, which is generally described based on body mass index, is now redefined as a complex, adiposity-based chronic disease. Both sarcopenia and obesity are heterogeneous syndromes resulting in physical disability, falls, and cardiometabolic risk. The convergence of these two conditions, sarcopenic obesity, has recently come to the forefront as a significant health concern, due to the growing aging population and rising prevalence of obesity. The lack of standardized diagnostic criteria has significantly contributed to disparities in their reported prevalence and also hindered diagnosis and management. A universally accepted definition remains elusive. This review is a comprehensive overview of the definitions and the ontogeny of diagnostic criteria for sarcopenia, obesity, and sarcopenic obesity.

Sarcopenia (A)

Introduction (B)

Sarcopenia is a generalized disorder, the hallmarks of which are a progressive decline in skeletal muscle mass, strength, and physical performance [1]. Although typically regarded as an age-related disorder, referred to as primary sarcopenia, it is now becoming commoner in younger age groups, particularly among those with chronic diseases including diabetes, metabolic syndrome, liver disease, cancers, chronic kidney disease, cardiac or respiratory failure, and other systemic inflammatory conditions [2,3]. Sarcopenia can also be drug related. Statins, antineoplastics, antidiabetic drugs (such as sodium-glucose co-transporter 2 (SGLT2) inhibitors, metformin, dipeptidyl peptidase 4 (DPP-4) inhibitors or gliptins, insulin, sulphonylureas/insulin secretagogue [glinides]), glucocorticoids, loop diuretics, colchicine are associated with sarcopenia [4]. The newer incretin-based anti-obesity drugs, glucagon-like peptide-1 receptor agonists (GLP-1RAs) and GLP-1/ glucose-dependent insulinotropic polypeptide (GIP) RAs, are associated with significant loss of muscle mass resulting in sarcopenia [5].

Sarcopenia differs from cachexia, which involves profound weight loss, simultaneous depletion of fat and muscle mass, and increased protein catabolism [6].

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It was Irwin H Rosenberg in 1988 who first pointed out that "*no single feature of age-related decline (is) more striking than the decline in lean body mass (which) affects ambulation, mobility, energy intake, overall nutrient intake and status, independence, and breathing*". He coined the term sarcopenia, originating from the Greek words sarx (flesh) and penia (loss) to describe this condition [7]. However, sarcopenia was not officially recognized as a distinct disease with its own the International Classification of Diseases, 10th Revision (ICD-10) code (M62.84) until 2016 [8].

Defining sarcopenia (B)

The first quantitative definition of sarcopenia was given by Baumgartner et al. in 1998, who defined it as appendicular skeletal muscle mass (kg)/height $(m)^2$ ratio ≥ 2 standard deviations below the sex-specific mean of a healthy young reference population [9].

The Special Interest Groups (SIG) on "cachexia-anorexia in chronic wasting diseases" and "nutrition in geriatrics" of the European Society for Clinical Nutrition and Metabolism (ESPEN) were the first to develop a consensus definition of sarcopenia in 2010 describing it as a loss of muscle mass and muscle strength that is associated with ageing [10].

In the same year, EWGSOP defined sarcopenia as "a syndrome characterised by progressive and generalised loss of skeletal muscle mass and strength". Further, it proposed three stages of sarcopenia: presarcopenia (low muscle mass), sarcopenia (low muscle mass with low muscle strength or poor physical performance), and severe sarcopenia (low muscle mass, low muscle strength, and poor physical performance) [11]. EWGSOP emphasised muscle mass more than muscle strength [12,13].

EWGSOP2 updated its definition in 2018, wherein it considered muscle strength as the primary measure of muscle function. While low muscle strength suggests probable sarcopenia, low muscle quantity or quality confirms the diagnosis. The presence of all three denotes severe sarcopenia [14].

In 2011, IWGS recommended that older adults with diminishing strength and function, especially those who find it difficult to rise from a chair, individuals with a history of recurrent falls or self-reported difficulty in mobility, be assessed for sarcopenia [15]. That year, the Society for Sarcopenia, Cachexia and Wasting Disorders (SSCWD) characterized sarcopenia as decrease in muscle mass and mobility impairment [16]. The FNIH Sarcopenia project, in 2014, linked low muscle mass in older adults to diminished muscle strength or weakness in its definition [6,17].

The definition put forward by the Sarcopenia Definitions and Outcomes Consortium (SDOC), in 2020, incorporated muscle weakness (indicated by low grip strength), and slowness (indicated by reduced usual gait speed). SDOC was the first group to exclude lean muscle mass from the definition of sarcopenia [18].

Sarcopenia was defined by AWGS, first in 2014 and in their update in 2019, as the age-related loss of skeletal muscle mass combined with low muscle strength and/or impaired physical performance [19,20].

The AWGS guidelines, however, have limited relevance in South Asia as the South Asian populations are ethnically and phenotypically distinct from those of East and Southeast Asia. The "thin-fat" phenotype, also referred to as normal-weight or sarcopenic obesity, is a unique South Asian phenotype [13]. Therefore, the South Asian Working Action Group on SARCOpenia (SWAG-SARCO) undertook to define sarcopenia as the loss of any two of the three muscle components (muscle function, muscle strength, and muscle mass), without prioritizing any one over the other/s, measured via clinical, biochemical, or imaging methods, reflecting the heterogeneous nature of the condition and its protean clinical presentations. This definition recognizes that all associated symptoms or conditions may not be present in every patient [13].

In 2024, the Global Leadership Initiative in Sarcopenia (GLIS), which included experts from all major sarcopenia societies, developed the "first global conceptual definition" of sarcopenia in 2024. It defined sarcopenia as a generalized skeletal muscle disease, the prevalence of which increases with age, and is potentially reversible. GLIS considered muscle mass, muscle strength, and muscle-specific strength as "components of sarcopenia", while impaired physical performance is deemed an "outcome" and not a defining component [21].

This GLIS definition was adopted by AWGS in its 2025 update, which took "a life-course approach" to promotion of muscle health. The definition of sarcopenia now also covers middle-aged adults, aged 50–64 years, using validated cut-offs. Diagnosis requires only low muscle mass and low muscle strength, while physical performance is treated as an outcome measure rather than as a diagnostic criterion [22].

Evolution of diagnostic criteria for sarcopenia (B)

The earliest definitions, notably by Baumgartner et al. in 1998 [9], Janssen et al. in 2004 [23], and Delmonico et al. in 2007 [24] were quantitative and focused on low muscle mass.

While the first EWGSOP guideline demarcated cut-off values at 2 standard deviations below the mean reference values, obtained from healthy young adults [11,25], EWGSOP2 simplified the process and provided precise cut-off values for measurement of variables, besides updating its diagnostic algorithm for sarcopenia as F-A-C-S (Find cases, Assess, Confirm, and Severity). It recommends using the SARC-F questionnaire to find cases with probable sarcopenia [14]. The SARC-F questionnaire screens for five self-reported components of sarcopenia: **S**trength, **A**ssistance with walking, **R**ising from a chair, **C**limbing stairs and **F**alls. A score ≥ 4 is predictive of ssarcopenia [13]. EWGSOP2 also categorized sarcopenia as acute (≤6 months) and chronic (≥6 months) [14].

The IWGS states that patients with a measured gait speed < 1.0 m/s should undergo whole-body dual-energy X-ray absorptiometry (DXA) to assess body composition [15].

The aforementioned diagnostic criteria are not applicable to Asians because of the inherent phenotypical differences between Asians and Caucasians - smaller stature, lower muscle mass and strength, and higher adiposity. Hence, AWGS developed specific diagnostic criteria for Asians based on evidence from Asian cohorts [13,26].

Table 1
Indian sarcopenia staging system.

Stage		Clinical status			Level of prevention
Numerical	**Descriptive**	**Risk factors**	**Symptoms/Signs**	**Complications**	
0	Healthy	Absent	Absent	Absent	Primordial
1	Preclinical	Present	Absent	Absent	Primary
2	Mild	Present	Present	Absent	Early secondary
3	Moderate	Present	Present	Present, without significant impairment of ADL	Advanced secondary
4	Severe	Present	Present	Present, with significant impairment of ADL	Tertiary

ADL: Activities of daily living.

Both AWGS1 and AWGS2 criteria (versus EWGSOP and IWGS) have specified lower thresholds for muscle mass, muscle strength, and physical performance. The lower cut-off points are due to the lower body weight of the Asians compared to that of the Caucasian populations [25]. AWGS 2019 also advocates the use of SARC-F questionnaire (≥ 4) or calf circumference (< 34 cm in men, < 33 cm in women) to screen for sarcopenia. It introduced the concept of "possible sarcopenia", defined by either low muscle strength (assessed via handgrip dynamometry) or low physical performance (assessed by gait speed or the 5-time chair stand test) only, specifically for use in primary care settings [20]. This permits timely identification of older adults exhibiting muscle weakness or low physical performance, even in the absence of definitive muscle mass data [27].

The main difference between the preceding definitions and the SDOC definition is the exclusion of lean body mass as a diagnostic criterion. Hence, the cut-off values for handgrip strength proposed by the SDOC are higher in comparison to those specified by the other working groups [25].

The 2022 South Asian consensus accords equal importance to muscle strength, muscle function, and muscle mass. Yet, it recognises that not all three are likely to be present in a single patient, thus increasing the chances of missed diagnosis. It also suggests the 5-S pathway for screening and diagnosing sarcopenia: Suspect, Screening, Secondary sarcopenia (including concomitant therapy), Severity (muscle strength, function, and/or mass), and Shared decision-making [13].

The absence of standardized criteria for assessing the severity of sarcopenia underscores the need for unified criteria. The Indian Sarcopenia Staging System (ISSS), developed by the Sarcopenia Clinical Outcomes and Perspectives (SCOPE) Task Force, aims to address this gap. It assesses risk factors, clinical presentation, and complications of sarcopenia to provide a comprehensive overview of the severity. ISSS lists 5 stages, numbered from 0 to 4, based upon their severity (Table 1). The ISSS lists modifiable and non-modifiable risk factors, as well as complications and comorbidities, in a simple, reader-friendly and user-friendly style. The same scale can be used in all populations, irrespective of ethno-specific cut-offs for muscle strength. However, being a novel tool, this needs validation in diverse clinical settings and across different populations [28].

The diagnostic criteria proposed by various working groups are summarized in Table 2.

Global burden of sarcopenia (B)

The prevalence of sarcopenia shows significant variations globally and is influenced by several factors such as age, comorbid conditions, environmental factors, and the adopted definition [29]. In Europe, the estimated prevalence ranges from 1% according to the European Working Group on Sarcopenia in Older People 2 (EWGSOP2) criteria to 33% based on the Asian Working Group for Sarcopenia (AWGS) 2014 criteria. Asia, which has the largest number of prevalence studies, reports rates varying from 9% with EWGSOP2 criteria, 15% with AWGS 2014 criteria, and 27% when muscle mass-based definitions are used. In North America, the prevalence ranges from 9% based on the Foundation for the National Institutes of Health (FNIH) criteria to 18% as per the muscle mass definitions. The prevalence is higher in South America; 18% with the International Working Group on Sarcopenia (IWGS) criteria and 35% based on muscle mass definitions. In Africa, prevalence varies from 9% using appendicular skeletal mass index to as high as 53% when defined by handgrip strength [29].

Prevalence of sarcopenia in Asia (C)

Around 16.5% of older adults living in the community in Asia have sarcopenia. As many as 28.7% have possible sarcopenia and 4.4% have severe sarcopenia [30]. In a systematic review and meta-analysis published in 2026, the pooled prevalence of sarcopenia in Asian adults with type 2 diabetes was 17%; the highest prevalence was found in Southeast Asia (28%) [31].

The prevalence of sarcopenia is also high among Indian adults, aged 35–70 years, with type 2 diabetes as shown in a cross-sectional study. Sarcopenia was present in 60% of the participants with diabetes and 28% without diabetes [32].

In the Sarcopenia-Chandigarh Urban Bone Epidemiological Study (Sarco-CUBES) study, the prevalence of probable sarcopenia, sarcopenia, and severe sarcopenia was 14.6%, 3.2%, and 2.3%, respectively in healthy Indian adults with mean age of 44 years [33]. Analysis of data of 26,780 community-dwelling adults aged $\geq$ 60 years in the Longitudinal Aging Study in India (LASI) showed the prevalence to be 43.6%, while 9.4% had severe sarcopenia [34].

Table 2
Comparison and contrast of various diagnostic criteria.

Working Group	Cut-offs		
	Muscle mass	**Muscle strength**	**Physical function**
EWGSOP 2010	Anthropometry DXA (ASM/ht2): < 7.26 kg/m^2 (males) & < 5.5 kg/m^2 (females) ***or*** BIA: < 8.87 kg/m^2 (males) & < 6.42 kg/m^2 (females) ***or*** CT/MRI	Hand grip strength: < 30 kg (males) & < 20 kg (females)	SPPB: ≤ 8 points Gait speed (6 min course): ≤ 1 m/sec
IWGS 2011	ALM/h2: ≤ 7.23 kg/m^2 (males) & ≤ 5.67 kg/m^2 (females)	*Undefined*	Gait speed (4 m course): < 1.0 m/sec
SCWD 2011	ALM/h2: ≥ 2 standard deviations below the mean for healthy adults aged 20–30 years of the same ethnicity	*Undefined*	Gait speed: ≤ 1 m/s 6-min walk distance: < 400 m
AWGS 2014	DXA: < 7.0 kg/m^2 (males) & < 5.4 kg/m^2 (females) BIA: < 7.0 kg/m^2 (males) & < 5.7 kg/m^2 (females)	Hand grip strength: < 26 kg (males) & < 16 kg (females)	Gait speed: ≤ 0.8 m/sec
EWGSOP 2018	DXA ASM/h2: < 7.0 kg/m^2 (males) & < 5.5 kg/m^2 (females) ASM: < 20 kg (males) & < 15 kg (females)	Hand grip strength (dynamometer): < 27 kg (males) & < 16 kg (females) Chair stand test: > 15 s for five rises	Gait speed: ≤ 0.8 m/sec SPPB: ≤ 8 points TUG: ≥ 20 s 400 m walk test: Non-completion or ≥ 6 min for completion
AWGS 2019	*Retains the cut-offs as in AWGS 2014* DXA: < 7.0 kg/m^2 (males) & < 5.4 kg/m^2 (females) BIA: < 7.0 kg/m^2 (males) & < 5.7 kg/m^2 (females)	Hand grip strength (dynamometer): < 28 kg (males) & < 18 kg (females)	6-min walk: < 1.0 m/s SPPB score: ≤ 9 points 5-time chair stand test: ≥ 12 s
SDOC 2020	*Not included in definition*	Hand grip strength: < 35.5 kg (males) & 20 kg (females)	Gait speed: ≤ 0.8 m/sec
SWAG-SARCO 2022	Calf circumference: Men < 34 cm and Women: < 33 cm ALM/height: ASMI (Lee's equation for Asians) Male: < 7.0 kg/m^2 and Female: < 5.7 kg/m	Hand grip strength: < 27.5 kg (males) & < 18 kg (females)	Gait speed: ≤ 0.8 m/sec

DXA: Dual-energy X-ray absorptiometry, ASM: Appendicular skeletal muscle mass, BIA: Bioelectrical impedance analysis, SPPB: Short Physical Performance Battery, ALM: Appendicular lean mass, CT: Computed tomography, MRI: Magnetic resonance imaging, TUG: Timed Up and Go, ASMI: Appendicular skeletal muscle mass index.

Obesity (A)

Epidemiology of obesity (B)

Obesity has evolved into a major global public health crisis and is no longer exclusive to the affluent countries. The low- and middle-income countries are now experiencing a growing burden of obesity. [35]. According to the World Health Organization (WHO), in 2022, worldwide 2.5 billion (43%) adults aged ≥ 18 years were overweight and 890 million (16%) had obesity [28]. By 2035, an estimated 1.9 billion adults, around 25% of the world population, are projected to develop obesity. This number is expected to rise to 3.80 billion adults by 2050, which is more than half of the adult population. Hence, obesity has been aptly described as a global pandemic [35]. In a 2024 meta-analysis, involving data of 469,766 participants from the WHO STEPwise approach to Surveillance (STEPS) surveys, American Samoa reported the highest prevalence of overweight and obesity (93.5%), whereas the Democratic People's Republic of Korea had the lowest prevalence (4.4%). The overall global prevalence was 37% [36].

Obesity is associated with noncommunicable diseases like diabetes, heart disease, and cancer. It is a major contributor to morbidity and mortality in both developed and developing countries. The associated stigma has significant adverse psychological outcomes. Obesity also imposes substantial economic costs, with the annual cost of overweight and obesity anticipated to reach $4.32 trillion, accounting for approximately 3% of the global GDP [35].

Defining obesity (B)

The WHO defines overweight and obesity as "abnormal or excessive fat accumulation that presents a risk to health". Although classification of obesity is routinely based on body mass index (BMI), it is not an accurate indicator of the percent of body fat, nor does it depict the distribution of fat across different body sites [37]. The American Medical Association, American Heart Association, and American Society for Metabolic and Bariatric Surgery have described obesity as a disease state resulting from a complex interplay of multiple factors [37].

Table 3
Parameters to assess obesity.

	International	Asian Indians
BMI	≥ 25 kg/m^2 (overweight) ≥ 30 kg/m^2 (obesity)	23.0–24.9 kg/m^2 (overweight) ≥ 25 kg/m^2 (obesity)
Waist circumference	≥ 102 cm (males) and ≥ 88 cm (females)	≥ 90 cm (males) and ≥ 80 cm (females)
Waist-hip ratio	≥ 0.90 (males) and ≥ 0.85 (females)	≥ 0.90 (males) and ≥ 0.85 (females)
Body fat%	≥ 25% (males) and ≥ 35 (females)	≥ 20% (males) and ≥ 33 (females)

In 2017, the American Association of Clinical Endocrinologists and American College of Endocrinology (AACE-ACE) introduced a new term for obesity: Adiposity-Based Chronic Disease (ABCD). It focuses on the pathophysiological consequences of excess weight rather than the body weight alone and helps reduce the stigma associated with the term "obesity" [38].

Diagnostic criteria for obesity (B)

Overweight, as stated by the WHO, is a BMI ≥ 25 kg/m^2 and obesity as BMI ≥ 30 kg/m^2 [28]. The diagnostic cut-offs for overweight and obesity, as per the 2016 AACE-ACE obesity guidelines, are consistent with WHO criteria, and recommend that a BMI ≥ 25 kg/m^2 should trigger further assessment for overweight or obesity [39]. In Japan, a BMI ≥ 23 kg/m^2 is considered overweight and a BMI ≥ 25 kg/m^2 is defined as obesity [40]. In 2009, the consensus statement for diagnosis of obesity for Asian Indians, based on BMI alone, defined normal BMI as 18.0–22.9 kg/m^2, overweight as 23.0–24.9 kg/m^2, and obesity as ≥ 25 kg/m^2 [41].

Table 3 compares the international cut-offs for various parameters used to assess obesity with those specific to Asian Indians [42].

Sarcopenic obesity (A)

Sarcopenic obesity or the co-existence of age-related loss of muscle mass and strength with obesity [35], is an emerging public health problem in older adults. It is associated with an increased risk of disability in daily living, along with heightened risk of cardiometabolic disease and related mortality [43,44].

Epidemiology of sarcopenic obesity (B)

The prevalence of sarcopenic obesity was found to increase with age in the Lifelines cohort study from the Netherlands, from 0.4% in those aged 20–29.9 years to 12.2% in those aged 80–89.9 years. The prevalence was higher in women (1.4%) than in men (0.9%) [44]. Gao et al. reported a prevalence of 11% among older adults, suggesting that more than 1 in 10 older adults globally may have sarcopenic obesity [45]. A 2023 meta-analysis reported a prevalence of 9% among elderly men and women [46], while the prevalence was 7% in a 2025 meta-analysis [47].

The prevalence also varies according to the diagnostic criteria used [48]. In a cross-sectional analysis of the SARCopenia and OSteoporosis in older adults with cardiovascular diseases (SARCOS) study, the prevalence was 1.6% when obesity was defined by BMI and increased to 14.1% when total body fat was used to define obesity [49].

The indications for evaluation of sarcopenic obesity are enumerated in Table 4.

Associated comorbidities (B)

Individuals with sarcopenic obesity have a higher risk of type 2 diabetes, dyslipidaemia and insulin resistance, and metabolic syndrome, all of which are risk factors for cardiovascular disease [50]. The risk of CVD is significantly increased (23%) in sarcopenic obesity compared to obesity and sarcopenia alone [51]. Sarcopenic obesity is associated with higher risk for CVD events, stroke and myocardial infarction, angina pectoris and heart failure [52].

Other associated comorbidities include depression, osteoporosis and knee osteoarthritis [50].

Table 4
Indications for evaluation of sarcopenic obesity.

Based on barophenotype	• Overt obesity • Hidden obesity (normal-weight obesity) • Lipodystrophy
Based on myophenotype	• Reduced muscle function • Reduced muscle strength • Reduced muscle mass
Based on investigations	• Abnormal metabolic parameter • Abnormal body composition analysis • Abnormal body fat distribution

Table 5
Sarcopenic obesity: anthropometric indices.

Waist circumference/calf circumference	Normal	< 2.5
Waist-Calf ratio	Suspected sarcopenic obesity	2.5–3.5
	Confirmed sarcopenic obesity	> 3.5
Calf circumference/Waist-hip ratio	Normal	> 40
Calf central index	Suspected sarcopenic obesity	30–40
	Confirmed sarcopenic obesity	< 30
BMI/Calf circumference	Normal	< 0.6
Body calf index	Suspected sarcopenic obesity	0.6–1.0
	Confirmed sarcopenic obesity	> 1.0

Individuals diagnosed with sarcopenic obesity should be comprehensively assessed for the presence of comorbidities including measurement of bone mineral density (BMD) using DEXA for osteoporosis, imaging for osteoarthritis, PHQ-9 (Patient Health Questionnaire-9) to screen for depression and cardiovascular risk evaluation.

Beyond traditional risk factors, cardiovascular risk stratification should also include major non-traditional biomarkers such as apolipoproteins A and B, inflammatory markers (high-sensitivity C-reactive protein), homocysteine, interleukins 1 and 6, tissue/tumor necrosis factor-α, brain natriuretic peptides, and lipoprotein(a), uric acid [53]. Frailty can be assessed by the Timed Up and Go test or the Clinical Frailty Scale particularly in primary care or OPD settings [54].

Diagnostic criteria of sarcopenic obesity (B)

The 2025 Asia-Oceania consensus proposes a diagnostic algorithm comprising of three steps: screening, diagnosis, and intervention. Screening for sarcopenia includes anthropometric measures of obesity (BMI, waist circumference, and calf circumference [M < 34 cm and F < 33 cm]), the SARC-F (score ≥ 4), and the Finger Ring test. Diagnosis is based on the objective assessment of muscle mass (DXA [M < 7.0 kg/m^2, F < 5.4 kg/m^2] or bioelectrical impedance analysis (BIA) [M < 7.0 kg/m^2, F < 5.7 kg/m^2]), muscle strength (handgrip strength [M < 28 kg, F < 18 kg]), and physical performance (gait speed [< 1.0 m/s], Short Physical Performance Battery (SPPB) [≤ 9], or the 5-times sit-to-stand test [≥ 12 s]) using validated methods [55].

The evaluation of sarcopenic obesity, as proposed by the European Association for the Study of Obesity (EASO) and ESPEN, is performed at two levels: screening and diagnosis, followed by staging [56].

Screening is based on detection of high BMI or waist circumference, using ethnicity-specific thresholds, concomitantly with indicators (such as clinical symptoms, risk factors) or questionnaires (such as the SARC-F in older adults), suggestive of sarcopenia. A positive screening result is an indication for assessment of skeletal muscle strength using hand-grip strength or chair-stand test (5-time sit-to-stand test, 30-s chair stand test). Altered skeletal muscle functional parameters merit evaluation of body composition by DXA, or BIA. Diagnosis of sarcopenic obesity is confirmed by the presence of both reduced skeletal muscle functional parameters and altered body composition characterized by increased fat mass percentage and reduced muscle mass. Staging is then done based on the presence of complications: Stage 1 with no complications and stage 2 with ≥ 1 sarcopenic obesity-related complications such as metabolic disorders, functional disability, or cardiovascular or respiratory disease [56].

Kalra et al. have proposed three easy to calculate anthropometric indices, based on accepted anthropometric measurements, to help in screening for sarcopenic obesity (Table 5) [43].

Summary (A)

Sarcopenia has emerged as a major clinical and public health concern, affecting not just the ageing population but also the younger age groups. The rapid rise in prevalence of obesity has taken an epidemic form causing significant public health challenges. Sarcopenic obesity, recently identified as an obesity phenotype, is increasing in prevalence among the elderly, although not exclusive to this age group. Sarcopenic obesity is associated with a greater cardiovascular risk compared to either sarcopenia or obesity. Accurate diagnosis and evaluation of sarcopenia and obesity, as well as sarcopenic obesity is therefore important.

Multiple diagnostic criteria have been defined for both sarcopenia and obesity. Diagnostic criteria, including anthropometric indices, for sarcopenic obesity have also been published. However, the lack of consensus on definitions, assessment modalities and cut-off values, precludes early identification. Consequently, it is often undiagnosed and undertreated.

Although awareness and understanding of sarcopenia and sarcopenic obesity has increased among the clinicians as well as the general public, there is clearly a need for a global consensus definition. The GLIS initiative is a welcome step towards harmonizing various definitions and standardizing diagnosis of sarcopenia, which may boost further research. Cut-offs for sarcopenia and obesity for various ethnicities require revision. Future diagnostic criteria may benefit from incorporating age-specific anthropometric thresholds. Meanwhile, increased availability and affordability of body composition assessment technology, such as DXA and BIA, will facilitate accurate and appropriate diagnosis as well as monitoring of obesity.

Research Agenda

- A global consensus definition of sarcopenia and sarcopenic obesity is required.
- Ethno-specific cut-offs for sarcopenia and obesity need to be revised.
- Anthropometric indices ratios for sarcopenic obesity must be validated in various populations.
- Age-specific anthropometric thresholds for diagnosis of sarcopenia and obesity may be considered in future.

Practice Points

- Sarcopenia is a systemic disorder, with multiple diagnostic criteria that reflect its multifaceted presentation.
- Sarcopenia is diagnosed by the loss of muscle strength, function and mass.
- Sarcopenic obesity, a combination of sarcopenia and obesity, is a frequently encountered barophenotype.
- Evaluation can be done by anthropometry and body composition analysis.

Declaarton of Competing Interest

The authors do not report any conflict of interest.

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