

· 综 述 ·

肌少症筛查工具的研究进展

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【摘要】 肌少症是一种常见的老年综合征,是进行性和全身性的骨骼肌疾病,与不良预后风险增加相关,如跌倒、骨折、失能等。早期筛查肌少症并进行相关干预,有助于维护老年人的身体健康及改善远期预后。目前我国肌少症筛查工作尚处于起步阶段,本文就常见的肌少症简易筛查工具,如SARC-F评分、SARC-CalF评分、Ishii评分、MSRA量表等评分标准及其在人群中的应用情况进行综述。

【关键词】 老年人;肌少症;筛查;评分

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Progress in research on screening tools for sarcopenia

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【Abstract】 Sarcopenia, a common geriatric syndrome, is a progressive and generalized skeletal muscle disorder associated with increased likelihood of adverse outcomes including falls, fractures, and physical disability. Early screening of sarcopenia and implementation of relevant interventions help the health maintenance in the elderly and improve long-term prognosis. Currently, sarcopenia screening in China remains in its infancy. This article reviews simple screening tools for sarcopenia, such as SARC-F score, SARC-CalF score, Ishii score and MSRA scale, and their applications in the population.

【key words】 aged; sarcopenia; screening; score

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肌少症(sarcopenia)是由Irwin Rosenberg^[1]在1989年首先提出的一种新的老年综合征,最初定义为年龄相关的骨骼肌减少,目前广泛接受的是2010年欧洲老年肌少症工作组(European Working Group on Sarcopenia on Older People, EWGSOP)^[2]提出的骨骼肌质量、力量和(或)功能的下降。60岁及以上人群的肌少症患病率约为10%^[3]。肌少症可能导致机体失能、残疾、生活质量下降甚至死亡等不良结局。我国老龄化社会形势十分严峻,我国社区居民肌少症的患病率为6.7%~18.0%^[4-7]。在老年人中应尽早进行肌少症的筛查^[2]。本文主要就肌少症的筛查工具进行综述。

1 肌少症的诊断

2018年EWGSOP^[8]更新了肌少症的诊断流程,

建议遵循筛查-评估-确诊-严重程度分级这一流程,以便系统地识别患有肌少症或其风险的人。(1)评估。即对肌肉力量的评估。使用握力评估上肢肌力;当受试者无法完成握力测试时,可进行椅子站立测试评估下肢肌力。(2)确诊。即测量骨骼肌质量。方法主要包括双能X射线骨密度仪(dual-energy X-ray absorptiometry, DXA)、生物电阻抗法(bioimpedance analysis, BIA)、磁共振成像(magnetic resonance imaging, MRI)、计算机断层扫描(computed tomography, CT)等,推荐临床实践中使用DXA,在研究中使用DXA、BIA、CT或MRI等评估骨骼肌质量^[8]。(3)严重程度分级。通过对肌肉功能的测试进行肌少症的严重程度分级,包括步态速度、简易机体功能评估(short physical performance battery, SPPB)、定时测试(timed up and go test, TUG)、400m步行测试等。

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2 肌少症的筛查工具

使用简单易用的评分量表进行筛查,以便达到早期诊断肌少症的目的。目前常用的筛查工具包括 SARC-F 评分(strength, assistance walking, rise from a chair, climb stairs and falls, SARC-F)^[9]、SARC-CalF 评分(strength, assistance walking, rise from a chair, climb stairs, falls and calf, SARC-CalF)^[10]、Ishii 评分(Ishii score chart, Ishii)^[11]、迷你肌少症风险评估(mini sarcopenia risk assessment, MSRA)问卷^[12]等(表1)。

2.1 SARC-F 评分

SARC-F 评分^[9]包括:肌肉力量、辅助行走、座椅起立、攀爬楼梯以及跌倒次数(表2),根据患者的完成情况进行赋值,总分0~10分,评分≥4分为可疑肌少症患者,<4分为正常。现已经广泛应用于多个国家,如西班牙、日本等。我国学者王晓英^[13]对该问卷进行了汉化,为我国老年人群肌少症筛查提供了可靠的工具。

SARC-F 适用于肌少症的初步筛查。Malmstrom 等^[14]在非裔美国人、巴尔的摩人老龄化纵向研究和国家健康与营养调查等三项研究中证明了 SARC-F 可用于检测有肌肉减少症不良后果风险的人群,且

该评分量表具有良好的一致性 & 有效性。Cao 等^[15]认为 SARC-F 评分是一种诊断身体功能受损的简易工具,也是预测老年人肌少症的有效工具。台湾的研究^[6]同样认为 SARC-F 可作为肌少症的快速筛查工具。李敏等^[16]认为 SARC-F 评分对于老年住院患者肌少症具有筛检价值。

SARC-F 评分基于患者对自身肌少症特征的报告,即对肌肉力量、行走及其他方面的自我感知,故特异度高而灵敏度低。Woo 等^[4]使用不同的标准验证 SARC-F 评分的诊断差异时发现 SARC-F 的特异性较高,但敏感性较差。Miller 等^[17]同样发现 SARC-F 的敏感性差而特异性较高。一项荟萃分析^[18]显示 SARC-F 的灵敏度 0.21, 特异度 0.90。Kotlarczyk 等^[19]研究显示 SARC-F 的灵敏度为 18.2%~33.3%, 特异度为 78.7%~81.1%, 认为 SARC-F 可用于长期护理机构患者的肌少症筛查,但灵敏度较低。

SARC-F 评分亦可用于预测不同人群的不良预后风险,如 SARC-F 联合骨折风险评估工具可以提高预测的灵敏度^[20],也适用于筛查老年心血管疾病患者的身体功能受损程度^[21],亦可用于预测养老院居民的死亡率^[22]。

表 1 肌少症的筛查工具

Table 1 Screening tools of sarcopenia

Team	Date	Tools	Objective	Participants	Variable
Malmstrom, <i>et al</i> ^[9]	2013	SARC-F	Identify individuals who need diagnosis of sarcopenia	—	Strength, assistance walking, rising from a chair, climbing stairs, and falls
Barbosa-Silva, <i>et al</i> ^[10]	2016	SARC-CalF	Improve SARC-F's sarcopenia screening performance	Urban population of Pelotas	SARC-F + Calf
Ishii, <i>et al</i> ^[11]	2014	Ishii	Identify older adults at high risk for sarcopenia	Community-dwelling adults of Japan	Age, grip strength and calf circumference
Rossi, <i>et al</i> ^[12]	2017	MSRA	Prescreening tool for sarcopenia	Community dwelling elderly subjects of Italy	Age, physical activity level, hospitalizations and weight loss, the meals frequency per day, dairy product consumption and protein consumption

表 2 SARC-F 评分

Table 2 SARC-F scale

Item	Score		
	0	1	2
How difficult you had lifting or carrying 10 pounds?	No difficulty	Some difficulties	A lot of difficulties or unable to do
How difficult you had walking across a room and whether you use aids or need help to do this?	No difficulty	Some difficulties	A lot of difficulties, use aids, or unable to do without personal help
How difficult you had transferring from a chair or bed and whether you used aids or needed help to do this?	No difficulty	Some difficulties	A lot of difficulties, use aids, or unable to do without help
How difficult you had climbing a flight of 10 steps?	No difficulty	Some difficulties	A lot of difficulties or unable to do
How many times you fall in the past year?	No	1-3 times	≥4 times

2.2 SARC-CalF 评分

SARC-CalF 评分将 SARC-F 评分和小腿围 (calf circumference, CC) 测量相关联, 在 SARC-F 评分的基础上, 对 CC 进行评分, 女性 $CC \leq 33$ cm 得 10 分, $CC > 33$ cm 为 0 分; 男性 $CC \leq 34$ cm 得 10 分, $CC > 34$ cm 为 0 分; 总分 0~20 分, 评分 ≥ 11 分为可疑肌少症患者, < 11 分为正常。

SARC-CalF 显著提高了 SARC-F 筛查肌少症的阳性率^[10]。Urzi 等^[23]报道 SARC-CalF 的灵敏度为 77.4%, 特异度为 89.8%, 认为 SARC-CalF 可以用于养老院居民肌少症的筛查。土耳其的一项研究^[24]中, 使用两个不同的 CC 定义, 发现 SARC-F 和 SARC-CalF-31 的灵敏度相似 (25%~50%), SARC-CalF-31 和 SARC-CalF-33 的特异度高于 SARC-F, SARC-CalF-33 的诊断准确度最高, 认为 SARC-CalF 提高了 SARC-F 的特异性和诊断准确性, 但灵敏度相同。

2.3 Ishii 评分

Ishii 评分包括 3 个变量: 年龄、握力和 CC, 使用上述 3 个变量推导出性别特异性的肌少症计算公式, 得分越高, 肌少症的患病率越高, 在其研究人群中, 推荐男性 ≥ 105 分、女性 ≥ 120 分作为肌少症的诊断截点^[11]。具体公式为:

男性得分 = $0.62 \times (\text{年龄} - 64) - 3.09 \times (\text{握力} - 50) - 4.64 \times (CC - 42)$; 女性得分 = $0.8 \times (\text{年龄} - 64) - 5.09 \times (\text{握力} - 34) - 3.28 \times (CC - 42)$ 。

Ishii 评分在筛查肌少症时具有较高的准确性。Locquet 等^[25]在比较 5 种肌少症筛查工具后, 发现 Ishii 评分的灵敏度高达 100%, 阴性预测值为 99.1%, 受试者工作特征曲线下面积 (area under curve, AUC) 为 0.914, 认为 Ishii 评分具有更高的准确性和敏感度。李敏等^[16]发现男性以 105 分为截点时约登指数达到最高水平, 其对应的灵敏度和特异度分别为 90.9% 和 70.4%; 女性在以 120 分为截点时约登指数达到最高, 其对应的灵敏度和特异度分别为 82.4% 和 70.0%, 认为 Ishii 评分对于社区老年人肌少症具有较高的筛检价值。

2.4 MSRA 问卷

MSRA 是 2017 年由 Rossi 等^[12]提出的筛查肌少症的工具 (表 3)。使用 MSRA-7 评分发现, 评分 ≤ 30 分的受试者肌少症风险较评分 > 30 分的受试者高出 4 倍, 进行校正后, 剔除蛋白质和乳制品消费量及每日进餐次数, 得出 MSRA-5 评分。MSRA-7 总分 0~40 分, 总分 ≤ 30 分提示受试者患有肌少症; MSRA-5 总分 0~60 分, 总分 ≤ 45 分提示受试者患

有肌少症。我国学者 Yang 等^[26]在 MSRA 量表的基础上进行了汉化, 并且征得原始 MSRA 量表作者 Rossi 博士的同意, 得出迷你肌少症风险评估量表中文版 (China mini sarcopenia risk assessment, C-MSRA)。

MSRA-5 比 MSRA-7 更适合老年肌少症的筛查工作。Rossi 等^[12]发现, MSRA-7 的灵敏度为 80.4%, 特异度为 50.5%, MSRA-5 灵敏度为 80.4%, 特异度为 60.4%, 认为 2 个版本均可用于预测肌少症。Yang 等^[26]发现 C-MSRA-7 的灵敏度为 78.0%~86.9%, 特异度为 38.3%~41.0%, C-MSRA-5 的灵敏度为 80.2%~90.2%, 特异度为 55.9%~70.6%, 认为中文版 C-MSRA 量表可以用于中国社区老年人的肌少症筛查, 且与 C-MSRA-7 相比, C-MSRA-5 更适合用于筛查肌少症。目前 MSRA 量表的应用较少, 需要在不同人群中进一步验证。

表 3 迷你肌少症风险评估量表

Table 3 Mini sarcopenia risk assessment questionnaire

Item	7 items (score)	5 items (score)
(1) How old are you?		
≥ 70 years	0	0
< 70 years	5	5
(2) Were you hospitalized in the last year?		
Yes, and more than 1 hospitalization	0	0
Yes, 1 hospitalization	5	10
No	10	15
(3) What is your activity level?		
I'm able to walk $< 1\,000$ m	0	0
I'm able to walk $\geq 1\,000$ m	5	15
(4) Do you eat 3 meals per day regularly?		
No, up to twice per week I skip a meal (e. g., I skip breakfast or I have only milky coffee or soup for dinner)	0	0
Yes	5	15
(5) Do you consume any of the following?		
Milk or dairy products (e. g., yogurt, cheese), but not every day	0	-
Milk or dairy products (e. g., yogurt, cheese), at last once per day	5	-
(6) Do you consume any of the following?		
Poultry, meat, fish, eggs, legumes, ragout, or ham, but not every day	0	-
Poultry, meat, fish, eggs, legumes, ragout, or ham, at last once per day	5	-
(7) Did you lose weight in the last year?		
> 2 kg	0	0
≤ 2 kg	5	10

3 不同筛查工具的比较

SARC-CalF 可以提高 SARC-F 的诊断准确性和灵敏度。Yang 等^[27]发现 SARC-CalF 的 AUC 最大, SARC-F 和 MRSA-5 的 AUC 没有差异, MRSA-7 的 AUC 最小, 认为 SARC-CalF 是在中国疗养院居民中筛查肌肉减少症的最佳选择。Yang 等^[7]的另一项研究发现 SARC-CalF 的灵敏度为 60.7%, 特异度为 94.7%, SARC-F 的灵敏度为 29.5%, 特异度为 98.1%, 认为 SARC-CalF 提高了 SARC-F 的灵敏度和总体诊断准确性。但土耳其的研究^[24]认为 SARC-CalF 提高了 SARC-F 的特异性和诊断准确性, 二者的灵敏度相同。

Ishii 评分的诊断准确度较 SARC-F 评分更高。李敏^[16]发现 Ishii 评分准确度高于 SARC-F, 认为 SARC-F 和 Ishii 评分对于老年住院患者肌少症均具有筛查价值, Ishii 的准确度更高。

MSRA-5 的灵敏度较 SARC-F 评分高, 但特异度较差。Yang 等^[5]发现 SARC-F 和 MSRA-7 之间以及 MSRA-7 和 MSRA-5 之间的 AUC 差异具有统计学意义, MSRA-5 灵敏度高, 而 SARC-F 特异度高。

4 总结

最新的共识^[8]推荐使用 SARC-F 进行肌少症的快速筛查。SARC-F 特异度高, 灵敏度较低, 简便易行, 且已在香港人群中得到初步验证^[4]; SARC-CalF 可以提高 SARC-F 的灵敏度和诊断准确性, 但需要测量 CC; Ishii 评分灵敏度及特异度较高, 计算费时; MSRA-5 灵敏度较 SARC-F 高, 相关研究较少。SARC-F 评分已在香港人群中得到验证, 而其他量表均未在大规模中国人群中进行应用, 仍需大量临床研究验证其可信度。综上所述, 本文推荐使用 SARC-F 评分作为中国社区居民肌少症的筛查工具。

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- (编辑: 门可)

• 消 息 •

《中华老年多器官疾病杂志》调整文末参考文献著录格式

自2017年1月起,我刊调整录用稿件的文末参考文献著录格式:(1)中文参考文献采用中英文双语著录,中文在前,英文在后;(2)参考文献如有“数字对象唯一标识符(DOI)”编码,应著录,列于末尾。

示例:

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