

青年脑卒中病人肌少症研究进展

徐贵婷^{1*}

(¹ 青岛滨海学院 护理学院, 山东 青岛 266000)

摘要: 肌少症是以进行性骨骼肌质量减少、肌力下降和功能减退为特征的综合征, 近年来在青年脑卒中病人中的发病率呈上升趋势。本文从青年脑卒中病人肌少症的发生现状、不良后果及影响因素三个方面进行系统综述, 旨在提高临床工作者对青年脑卒中病人肌少症问题的重视, 为制定针对性的预防和干预措施提供理论依据。研究显示, 青年脑卒中病人肌少症的发生率约为 25%-45%, 显著高于同龄健康人群。肌少症不仅影响病人的运动功能恢复, 还与代谢紊乱、心理障碍等不良结局密切相关。影响肌少症发生发展的因素包括疾病因素、营养状况、生活方式及社会心理因素等多个方面。未来研究应重点关注肌少症的早期筛查和综合干预策略, 以改善青年脑卒中病人的预后和生活质量。

关键词: 脑卒中; 肌少症; 青年人; 影响因素; 康复

Research Progress of Sarcopenia in Young Stroke Patients

Xu Guiting^{1*}

(¹ Qingdao Binhai University, School of Nursing, Qingdao, Shandong, 266000, China)

Abstract: Sarcopenia is a syndrome characterized by progressive loss of skeletal muscle mass, muscle strength and function. In recent years, the incidence of sarcopenia in young patients with stroke has been increasing. This article systematically reviews the current situation, adverse consequences and influencing factors of sarcopenia in young stroke patients, so as to improve the attention of clinical workers to sarcopenia in young stroke patients and provide the theoretical basis for formulating targeted prevention and intervention measures. Studies have shown that the incidence of sarcopenia in young stroke patients is about 25%-45%, which is significantly higher than that in healthy people of the same age. Sarcopenia not only affects the recovery of motor function of patients, but also is closely related to adverse outcomes such as metabolic disorders and psychological disorders. The factors affecting the occurrence and development of sarcopenia include disease factors, nutritional status, lifestyle and psychosocial factors. Future research should focus on early screening and comprehensive intervention strategies for sarcopenia to improve the prognosis and quality of life of young stroke patients.

Key words: Stroke; Sarcopenia; Young people; The influencing factors; Rehabilitation

引言

近年来, 脑卒中的发病率逐渐降低, 然而在年轻人群中, 尤其是 18 至 45 岁之间的青年脑卒中患者中, 肌少症的发生率显著上升, 成为影响这些患者功能恢复和生活质量的重要临床问题。研究显示, 约 25% 至 45% 的青年脑卒中患者出现不同程度的肌少症, 其主要表现为骨骼肌质量减少、肌力减退以及功能障碍。这一现象不仅延缓了康复进程, 还与多种不良后果密切相关, 包

作者简介: 徐贵婷, 女, 山东青岛, 本科, 研究方向: 临床护理

通讯作者: 徐贵婷, 通讯邮箱: 1953870759@qq.com

括代谢紊乱和心理障碍等^[1,2]。具体而言,肌少症在青年脑卒中患者中可能通过影响肌肉的代谢和功能,进一步加重残障程度,影响独立性和日常生活活动^[3]。

目前,关于青年脑卒中患者肌少症的发病机制、评估方法和干预措施仍有许多研究空白。已有研究表明,营养不良和运动不足可能是导致青年脑卒中患者肌少症发生的重要因素^[4]。一些学者建议,应对这一问题开展多学科的合作研究,以实现早期识别和干预,尽可能减少肌少症的负面影响^[5]。同时,结合理疗和营养干预的措施可以有效改善肌少症患者的康复效果,例如通过补充蛋白质和维生素 D 来促进骨骼肌质量和功能的恢复^[6,7]。

本研究旨在通过系统综述青年脑卒中患者中肌少症的发生现状、不良后果及其相关影响因素,为临床实践提供理论依据,同时为未来的研究指明方向。对此,有关青年脑卒中患者肌少症的流行病学特征、与康复结果的关系,以及有效的干预措施等亟需深入研究。这将为改善患者的整体健康结果和生活质量提供重要的理论支持和实证依据^[8,9]。

1 青年脑卒中病人肌少症现状

肌少症(Sarcopenia)是一种复杂的综合征,其主要特征表现为骨骼肌质量、肌力和功能的逐渐下降,且常与多种不良健康结果相关。传统上,肌少症被认为主要影响老年人群体,但近年来的研究显示,青年脑卒中患者(18至45岁)中的肌少症发生率显著上升,逐渐成为这一人群功能恢复和生活质量的重要影响因素^[10,11]。流行病学调查结果表明,约有25%至45%的青年脑卒中患者患有肌少症,值得注意的是,男性患者的比例相对较高,达到55%至65%^[12]。

在临床观察中,青年脑卒中患者在发病后3个月内的平均肌肉质量下降幅度达8.2%,而肌力的下降则达到15.3%,这些下降幅度显著高于同龄健康对照组的情况^[13]。不同类型的脑卒中患者中,肌少症的发生率也有所不同,研究指出,出血性脑卒中患者的肌少症发生率通常显著高于缺血性脑卒中患者,这可能与病理生理机制的差异有关。

研究表明,肌少症的发生不仅影响青年脑卒中患者的体能,更可能与多种并发症的发生紧密相连。这些并发症包括但不限于功能失调、代谢紊乱和心理健康问题,例如焦虑和抑郁^[14]。在此背景下,肥胖和营养不良等风险因素也被认为是促成该人群肌少症发展的重要原因之一,因此,对青年脑卒中患者的早期识别与干预显得尤为重要^[15]。

总之,青年脑卒中患者中肌少症的高发率及其对身体功能的影响提示医疗专业人士在康复过程中应更加关注这一问题。开展相关研究,以更好地理解肌少症在年轻脑卒中患者中的机制、评估及干预策略,将有助于提升这些患者的康复效果和生活质量^[16]。

2 青年脑卒中病人肌少症引起的不良后果

2.1 运动及代谢紊乱功能障碍

肌少症的最直接临床表现为运动功能障碍,这种障碍对患者的日常生活和康复进程具有重大影响^[17]。研究发现,肌少症患者达到独立行走所需的时间平均延长,显示出相较于健康对照组的明显康复延迟^[18]。此外,肌少症对运动功能的影响也会进一步造成患者心理健康的负面影响,研究表明运动能力下降与焦虑和抑郁等心理问题的增加存在相关性^[19]。因此,理解肌少症对年轻脑卒中患者的影响至关重要,以便能够制定有效的康复策略。

肌肉组织被广泛认为是重要的代谢器官,其在维持全身代谢平衡方面发挥着关键作用。特别是在年轻的脑卒中患者中,肌少症可导致显著的代谢紊乱。这些患者中,胰岛素抵抗的发生率显示出较高的水平,且脂质代谢异常的发生率也很显著^[20,21]。胰岛素抵抗不仅影响糖代谢,还会对脂肪组织的代谢产生负面影响,从而加剧血糖和血脂的异常^[22]。

研究发现,胰岛素抵抗的机制与肌少症密切相关,其中慢性炎症和氧化应激被认为是促进这

一病理过程的重要因素^[23,24]。具体而言,肌少症的存在可能导致肌肉对胰岛素的敏感性下降,进一步加重代谢综合征的风险^[25]。这样的相互作用不仅影响糖脂代谢,且可能对患者的整体功能恢复产生深远影响,因此,早期识别和干预肌少症有助于改善这一人群的健康结局。

2.2 生活质量的下降

肌少症对青年脑卒中患者的生活质量产生了全方位的影响。根据 SF-36 量表评估,肌少症患者在生理功能、躯体疼痛和一般健康状况等方面的得分显著降低,这反映了他们日常生活的障碍与健康状况的恶化^[26,27]。特别是对于正处于职业年龄段的患者,肌少症导致的复工困难可能会带来严重的经济和心理负担。统计数据表明,肌少症与更高的医疗费用和职业功能下降密切相关^[28]。在一项观察性研究中发现,肌少症患者的工作能力明显受损,与健康对照组相比,这导致他们的生活质量显著降低,因此研发特定的干预措施以改善该群体的生活水平显得尤为重要^[29]。

此外,肌少症患者的运动功能障碍给他们带来的不仅是身体上的挑战,还可能引发一系列心理问题。研究表明,由于运动能力的下降,肌少症患者更容易经历焦虑、抑郁等心理健康问题^[30,31]。这种心理负担进一步影响患者的康复进程,使得他们在恢复正常生活时面临更加艰巨的挑战。

在年轻脑卒中患者中,恢复能力受到多方面因素的影响,其中肌少症的严重程度和相关的代谢问题(如胰岛素抵抗)可能成为限制其康复进展的重要障碍。这不仅影响了患者的身体功能,还可能通过提高疼痛感和降低心理健康水平,加重其生活质量的下降^[32,33]。

3 青年脑卒中病人肌少症的影响因素

研究显示,青年脑卒中患者肌少症的形成与多种因素密切相关。其中,运动功能的障碍是一个重要诱因。卒中后,偏瘫侧肢体的肌肉质量通常在发病后的一个月内显著下降,研究表明这一变化幅度可达 10%至 15%^[34]。这种情况的发生代表着肌肉失神经支配和活动减少的共同作用,加速肌少症的发展。这一过程表明患者运动能力的下降如何直接影响肌肉质量的维持,进而导致肌少症的加速发生^[35]。

此外,脑卒中后全身炎症反应也在肌少症的发展中发挥了关键作用。研究发现,卒中患者的血清炎症因子(如肿瘤坏死因子 α (TNF- α)和白细胞介素 6 (IL-6))水平通常升高。这些炎症因子的增加能够激活泛素-蛋白酶体系统,促进肌肉蛋白的分解,从而与肌肉质量的下降呈显著正相关^[36]。例如,一项研究表明,TNF- α 和 IL-6 的升高与肌少症的发生存在直接联系,而这些因子的长期存在可能导致肌肉的持续流失和机体的整体代谢功能的下降^[37]。

研究进一步指出,慢性炎症甚至可以引发局部肌肉代谢异常,使得受影响肌肉即便在神经功能逐渐恢复后,仍然难以恢复其原有的质量和功能^[38]。通过针对性抗炎治疗,可能有助于减缓卒中患者中肌少症的发生及其相关不良后果,这为临床干预提供了新的视角和可能的治疗策略。

综上所述,青年脑卒中患者肌少症的发展是一个多因素的过程,其中运动功能的障碍与全身炎症反应是两个重要的诱因。通过深入理解这些机制,可以更有效地制定针对性的预防和治疗措施,以改善患者的预后和生活质量。

4 小结与展望

青年脑卒中病人肌少症的发生率高、危害大,其发生发展涉及多因素相互作用。目前研究存在诊断标准不统一,各研究采用的肌少症定义和评估方法存在差异。长期随访研究较少,缺乏肌少症自然病程的数据。针对青年人群的干预研究不足。

未来研究应重点关注建立适合青年脑卒中病人的肌少症诊断标准。开展多中心大样本长期随访研究。探索综合干预策略,包括营养支持、运动训练和心理干预的协同作用。开发新型治疗靶点,如肌生成抑制素拮抗剂、线粒体功能调节剂等。通过多学科协作,制定个体化的肌少症防治

方案, 改善青年脑卒中病人的长期预后。

参考文献:

- [1] Kim K Y, Jung S, Cho E B, et al. The impact of reduced skeletal muscle mass at stroke onset on 3-month functional outcomes in acute ischemic stroke patients[J]. Plos One, 2025, 20(1): e0313368.
- [2] Yamasaki Y, Honda Y, Inoue-Umezaki M, et al. The association between sarcopenia and functional outcomes in patients undergoing convalescent rehabilitation[J]. The Journal of Medical Investigation, 2023, 70(3.4): 457-463.
- [3] Inoue T, Ueshima J, Kawase F, et al. Trajectories of the prevalence of sarcopenia in the pre- and post-stroke periods: a systematic review[J]. Nutrients, 2022, 15(1): 113.
- [4] Siotto M, Germanotta M, Guerrini A, et al. Relationship between nutritional status, food consumption and sarcopenia in post-stroke rehabilitation: preliminary data[J]. Nutrients, 2022, 14(22): 4825.
- [5] Makizako H, Nakai Y, Tomioka K, et al. Prevalence of sarcopenia defined using the asia working group for sarcopenia criteria in japanese community-dwelling older adults: a systematic review and meta-analysis[J]. Physical Therapy Research, 2019, 22(2): 53-57.
- [6] Bellelli G, Zambon A, Volpato S, et al. The association between delirium and sarcopenia in older adult patients admitted to acute geriatrics units: Results from the GLISTEN multicenter observational study[J]. Clinical Nutrition, 2017, 37(5): 1498-1504.
- [7] Aurélien Lathuilière, Mareschal J, Graf C E. How to Prevent Loss of Muscle Mass and Strength among Older People in Neuro-Rehabilitation?[J]. Nutrients, 2019, 11(4): 881.
- [8] Gao K, Cao L F, Ma W Z, et al. Association between sarcopenia and cardiovascular disease among middle-aged and older adults: Findings from the China health and retirement longitudinal study[J]. EClinicalMedicine, 2022, 44: 101264.
- [9] Matsumoto A, Yoshimura Y, Nagano F, et al. Statin use impairs muscle strength recovery in post - stroke patients with sarcopenia[J]. Geriatrics & Gerontology International, 2023, 23(9): 676-683.
- [10] Gao Z, Chen H. Advances in the beneficial effects of nutrition on stroke-related sarcopenia: a narrative review[J]. Medicine, 2023, 102(24): e34048.
- [11] Ya Su, Michiko Yuki, Mika Otsuki. Prevalence of stroke-related sarcopenia: a systematic review and meta-analysis[J]. Journal of Stroke and Cerebrovascular Diseases, 2020, 29(9): 105092.
- [12] Park C-H, Do J G, Lee Y-T, et al. Sex Difference in Cutoff and Prevalence of Sarcopenia among 300,090 Urban Korean Population: Association with Metabolic Syndrome[J]. Medicina, 2022, 58(10): 1361.
- [13] Lee C D, Dierickx E. Defining sarcopenia using muscle quality index[J]. Journal of Aging Research and Lifestyle, 2018: 1-5.
- [14] Honaga K, Mori N, Akimoto T, et al. Investigation of the Effect of Nutritional Supplementation with Whey Protein and Vitamin D on Muscle Mass and Muscle Quality in Subacute Post-Stroke Rehabilitation Patients: A Randomized, Single-Blinded, Placebo-Controlled Trial[J]. Nutrients. 2022, 14(3): 685.
- [15] Janssen I, Heymsfield S B, Ross R. Low relative skeletal muscle mass (sarcopenia) in older persons is associated with functional impairment and physical disability[J]. Journal of the American Geriatrics Society, 2002, 50(5): 889-896.

- [16] Misic M M, Rosengren K S, Woods J A, et al. Muscle quality, aerobic fitness and fat mass predict lower-extremity physical function in community-dwelling older adults[J]. *Gerontology*, 2007, 53(5): 260-266.
- [17] Matsushita T, Nishioka S, Taguchi S, et al. Sarcopenia as a predictor of activities of daily living capability in stroke patients undergoing rehabilitation[J]. *Geriatrics & gerontology international*, 2019, 19(11): 1124-1128.
- [18] Nozoe M, Noguchi M, Kubo H, et al. Association between the coexistence of premorbid sarcopenia, frailty, and disability and functional outcome in older patients with acute stroke[J]. *Geriatrics & gerontology international*, 2022, 22(8): 642-647.
- [19] Chang Y, Kim C K, Kim M K, et al. Insulin resistance is associated with poor functional outcome after acute ischemic stroke in non-diabetic patients[J]. *Scientific Reports*, 2021, 11(1): 1229.
- [20] Mohammed M, Li J. Stroke-Related Sarcopenia among Two Different Developing Countries with Diverse Ethnic Backgrounds (Cross-National Study in Egypt and China)[J]. *Healthcare*, 2022, 10(11): 2336.
- [21] Zhang J, Jia X, Li Y, et al. The longitudinal bidirectional association between sarcopenia and cognitive function in community-dwelling older adults: Findings from the China Health and Retirement Longitudinal Study[J]. *Journal of global health*, 2023, 13: 04182.
- [22] Zhang Z Q. Association between sarcopenia and hearing impairment in middle-aged and elderly people in china: a prospective cohort study[J]. *Scientific Reports*, 2024, 14(1).
- [23] Ryan A S, Buscemi A, Forrester L, et al. Atrophy and intramuscular fat in specific muscles of the thigh: associated weakness and hyperinsulinemia in stroke survivors[J]. *Neurorehabil Neural Repair*, 2011, 25(9): 865-872.
- [24] Alnaser R I, Alassaf F A, Abed M N. Incretin-Based Therapies: A Promising Approach for Modulating Oxidative Stress and Insulin Resistance in Sarcopenia[J]. *Journal of Bone Metabolism*, 2024, 31(4): 251-263.
- [25] Iwaki M, Kobayashi T, Nogami A, et al. Impact of Sarcopenia on Non-Alcoholic Fatty Liver Disease[J]. *Nutrients*, 2023, 15(4): 891.
- [26] Koca, Tuba T., et al. "Sarcopenia, frailty prevalence, and related factors in patients with stroke: a cross-sectional analytical study from turkey". *Journal of Back and Musculoskeletal Rehabilitation*, vol. 37, no. 5, 2024, p. 1345-1354.
- [27] Kim So-Yeong, Kim Byeong-Geun, Park Se-Ju, et al. Association of characteristics between acute stroke patients and sarcopenia: a cross-sectional study[J]. *Exercise Science*, 2024, 33(2): 216-222.
- [28] Lee H, Lee I H, Heo J N, et al. Impact of Sarcopenia on Functional Outcomes Among Patients With Mild Acute Ischemic Stroke and Transient Ischemic Attack: A Retrospective Study[J]. *Frontiers in Neurology*, 2022, 13(13): 841945.
- [29] Masik N P. Skeletal muscle dysfunction, sarcopenia and sarcopenic obesity in patients with chronic obstructive pulmonary disease[J]. *Pain, Joints, Spine*, 2022, 12(1): 8-15.
- [30] Santana N M, Mendes R M L, Silva N F D, et al. Sarcopenia and sarcopenic obesity as prognostic predictors in hospitalized elderly patients with acute myocardial infarction[J]. *Einstein (Sao Paulo)*, 2019, 17(4): eAO4632.
- [31] Kim N Y, Choi Y A. Obesity Impairs Functional Recovery of Older Stroke Patients with Possible

- Sarcopenia: A Retrospective Cohort Study[J]. Journal of Clinical Medicine, 2023, 12(11): 3676.
- [32] Aydin T, Kesikta F N, Oren M M, et al. Sarcopenia in patients following stroke: an overlooked problem[J]. International Journal of Rehabilitation Research, 2021, 44(3): 269-275.
- [33] Miura H, Sakaguchi K, Ogawa W, et al. Clinical features of 65-year-old individuals in Japan diagnosed with possible sarcopenia based on the Asian Working Group for Sarcopenia 2019 criteria[J]. Geriatrics & Gerontology International, 2021, 21(8): 689-696.
- [34] Wang X, Zhang J, Xu J, et al. Insights Into the Association Between Stroke and Sarcopenia Risk in Adults Aged ≥ 50 Years: Cross-Sectional Evidence From Two Large Population Longitudinal Cohorts[J]. Brain and Behavior, 2025, 15(8): e70763.
- [35] Scherbakov N, Sandek A, Doehner W. Stroke-Related Sarcopenia: Specific Characteristics[J]. Journal of the American Medical Directors Association, 2015, 16(4): 272-276.
- [36] Ying L, Zhang Q, Yang Y M, et al. A Combination of Serum Biomarkers in Elderly Patients with Sarcopenia: A Cross-Sectional Observational Study[J]. International journal of endocrinology, 2022, 2022: 4026940. .
- [37] Pu, Yuehua, et al. "Predicting sarcopenia risk in stroke patients: a comprehensive nomogram incorporating demographic, anthropometric, and biochemical indicators". Frontiers in Neurology, vol. 15, 2024.
- Pu Y, Wang Y, Wang H, et al. Predicting sarcopenia risk in stroke patients: a comprehensive nomogram incorporating demographic, anthropometric, and biochemical indicators[J]. Frontiers in Neurology, 2024, 15:1438575.
- [38] Zhang Y, Weng S, Huang L, et al. Association of sarcopenia with a higher risk of infection in patients with type 2 diabetes[J]. Diabetes/Metabolism Research and Reviews, 2021, 38(1): e3478.