

· 综述 ·

老年糖尿病患者伴衰弱的营养管理

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【摘要】 随着我国人口老龄化,老年糖尿病患病率逐年升高。老年糖尿病患者营养不良发生风险增高,更易导致衰弱的发生。糖尿病和衰弱的发生发展相互作用,从而对患者的临床结局产生不利影响。对老年糖尿病患者的衰弱早期识别并进行合理的营养支持,可以减缓或逆转衰弱进程,提高老年患者生活质量并减少医疗负担。本文就目前国内外对于老年糖尿病患者伴衰弱的营养管理研究进展予以综述。

【关键词】 老年人;糖尿病;衰弱;营养支持

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Nutrition management for frail elderly with diabetes mellitus

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【Abstract】 The prevalence of diabetes mellitus in the elderly has been increasing with the aging of the population. Older diabetes people are at a higher risk for malnutrition, and may be more likely to develop frailty. The development of diabetes is associated with progression of frailty, which lead to adverse effect on clinical outcomes. Early identification of frailty and rational nutritional support for the elderly diabetes patients can slow or reverse the process of frailty, improve the quality of life, and reduce the medical burden. This review aims to summarize the current research progress on nutritional management for the frail elderly with diabetes mellitus.

【Key words】 aged; diabetes mellitus; frailty; nutritional support

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近年来,我国老龄化程度逐渐加剧,老年人群中糖尿病患病率不断升高。根据国际糖尿病联盟报告显示,2019年中国 ≥ 65 岁的老年糖尿病患者约3550万,居世界首位,且仍呈上升趋势^[1]。近期发表的我国大型横断面调查数据显示,依据美国糖尿病学会(American Diabetes Association, ADA)诊断标准,60~69岁糖尿病患病率为23.9%,在 ≥ 70 岁的人群中患病率为27.3%^[2]。随着病程的延长,老年糖尿病患者常伴有多种并发症,如糖尿病视网膜病变、肾功能不全及外周血管病变等,严重影响老年人的自主活动能力和生活质量。研究发现糖尿病使老年人发生衰弱的风险增加,导致活动能力下降,增加死亡和残疾的风险^[3,4]。近期国内横断面研究结果显示,我国社区老年2型糖尿病患者中衰弱前期和衰弱的患病率高达51.5%和19.2%^[5]。另一方面,前瞻性研究荟萃分析发现糖尿病是认知障碍和痴呆的重要危险因素^[6],老年人认知功能下降会进一步增加衰弱的风险^[7]。因此针对老年糖尿病患者早期识别衰弱并

干预,有助于改善患者预后并减少医疗开支^[8]。本文就目前对于国内外对于老年糖尿病患者伴衰弱的营养管理研究进展予以综述。

1 老年糖尿病与衰弱

衰弱通常是由于生理系统中与年龄相关的渐进性衰退与疾病相互作用,从而导致机体功能储备能力的下降。衰弱老人在经历外界小刺激时即可引起健康相关负面事件的发生,跌倒、住院、残疾和死亡的风险都会显著增加^[9]。多项研究表明糖尿病患者的衰弱发病率明显高于非糖尿病的老年人群。根据英国UK BIOBANK队列研究表明糖尿病使衰弱的风险增加5倍^[10]。北京老龄化多维纵向研究显示,糖尿病患者的虚弱患病率高达19.3%,而在非糖尿病患者中患病率为11.9%^[11]。衰弱也会增加老年糖尿病患者死亡和残疾的风险^[12]。

糖尿病的发病机制与衰弱密切相关。胰岛素抵抗会导致蛋白质合成途径的刺激减少和蛋白质降解

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途径增加,进而导致肌肉的损失^[13]。长期的高血糖与胰岛素抵抗增加、慢性炎症、氧化应激和线粒体功能障碍有关,这些都会对骨骼肌的质量和功能产生有害影响,导致肌肉减少症和衰弱^[14]。此外,近期研究发现血糖水平的大幅波动可能导致脑白质病变、认知功能障碍和工具性日常生活活动能力下降^[15]。横断面和纵向研究结果显示随着糖尿病的病程的延长和糖化血红蛋白(glycated haemoglobin, HbA1c)水平的升高,糖尿病患者的肌肉质量和力量的损失也随之增加^[16]。糖尿病和衰弱发生发展互相影响,从而对患者的临床结局产生不利影响,因此应及时对老年糖尿病患者进行衰弱的评估和干预,从而减缓衰弱的进程。

2 老年糖尿病伴衰弱的营养管理

老年糖尿病患者是营养不良的高发人群。西班牙一项对1090例平均年龄为78岁的老年住院糖尿病患者的调查发现,分别有39.1%和21.2%的人有营养不良的风险和营养不良^[17]。营养不良是衰弱发生发展的重要生物学机制,日常能量摄入不足,营养评分较低的老年人,衰弱的发生率显著增加^[18,19]。针对老年糖尿病患者应进行及时的营养风险评估,可采用营养风险筛查评分简表、微型营养评价量表等营养不良筛查工具评估患者营养风险,尽早发现并及时进行干预,有利于改善患者预后^[20]。

2.1 体质量管理

老年糖尿病患者的肥胖率逐年增加。肥胖可直接或间接增加心血管疾病的发病率和死亡率。针对中老年糖尿病患者的AHEAD临床试验结果显示,强化生活方式干预可以减轻体质量、增加高密度脂蛋白胆固醇、降低收缩压、降低HbA1c水平和减少腰围^[21]。ADA建议患有2型糖尿病、超重/肥胖和具有安全运动能力的老年人,应考虑以饮食改变、身体活动和适度减重(例如5%~7%)为重点的强化生活方式干预,有利于改善生活质量、活动能力和身体机能,以及控制心脏代谢风险因素^[22]。低身体质量指数(body mass index, BMI)也会增加衰弱风险。在一项日本的横断面研究显示BMI与衰弱的关系呈U型,在BMI为21.4~25.7 kg/m²的个体中观察到的衰弱风险最低^[23]。但是老年人随着年龄增加会出现肌肉减少、脂肪增多的改变,建议对老年人进行肥胖评估时,除BMI之外还需关注腰围、身体肌肉量,综合评价体质量、身体成分后制定体质量管理策略^[20]。此外,应鼓励老年糖尿病患者通过加强抗阻训练和蛋白质摄入以增加身体肌肉量,避免因减重

导致的肌肉减少。

2.2 能量及营养素摄入

2.2.1 能量 足够的能量摄入可以降低老年患者衰弱发病率。欧洲临床营养和代谢学会建议老年人的摄取热量目标为20~30 kcal/(kg·d),根据个人活动量、疾病及食量耐受等进行差异性评估^[24]。日本糖尿病协会指南建议老年患者的总能量摄入需求应使用年龄相关目标体质量(kg)=[22~25 kg/m²×身高(m)²]乘以相应的身体活动系数^[25]。Rotterdam队列研究调查了中老年人能量摄入和衰弱的相关性,结果显示每增加418.4 kJ(100 kcal),虚弱的风险就会降低大约5%^[26]。

2.2.2 蛋白质 充足的蛋白质有助于老年糖尿病患者维持肌肉质量和功能并降低衰弱的风险。建议健康的老年人蛋白质摄入量最低为1.0 g/(kg·d);肌少症或者有慢性病的老年患者蛋白质摄入量建议为1.2~1.5 g/(kg·d)^[27]。观察性研究表明较高的蛋白质摄入量与较低的衰弱发生风险和更好的肌肉功能(身体机能)相关^[28]。对糖尿病老年女性患者进行的3年随访研究结果显示,蛋白质摄入量≥1.0 g/(kg·d)的患者在膝关节伸展力量和身体功能方面的下降幅度更小^[29]。

但是老年糖尿病患者常伴有肾功能不全,需适当限制蛋白质摄入量。国内《老年糖尿病诊疗指南(2021)》中建议对于非透析患者,推荐优质蛋白质摄入量0.8 g/(kg·d),同时限制钠盐摄入^[20]。除动物蛋白外,也可选择优质的植物蛋白。植物蛋白可以减轻胰岛素抵抗,降低心血管疾病风险^[30]。

2.2.3 脂肪酸 多不饱和脂肪酸(polyunsaturated fatty acids, PUFA)尤其是n-3 PUFA的摄入有利于降低心血管疾病和衰弱的风险。横断面研究发现饱和脂肪酸的摄入与中老年人衰弱和死亡的较高风险相关,多不饱和脂肪酸与较低的死亡风险相关^[31]。临床干预研究发现每日补充n-3 PUFA有助于提高老年人的步行速度和肌肉强度及功能,但是结论并未完全统一^[32]。最近的一项干预试验中针对老年糖尿病患者的亚组分析结果显示,补充高剂量二十碳五烯酸乙酯(4 g/d)可降低已经接受他汀类药物的高甘油三酯患者心血管不良事件的风险^[33]。

2.2.4 维生素D 维生素D可以促进肠道对于钙的吸收,增加骨矿物质密度并降低骨折风险。维生素D缺乏会增加肌少症和衰弱的风险^[34]。临床试验研究结果显示,维生素D补充剂(联合蛋白质或运动干预)可以改善老年肌少症患者的肌肉质量和功能^[35]。近年来,研究发现维生素D参与

葡萄糖稳态,并有助于改善胰岛素抵抗。补充维生素 D 有助于老年糖尿病患者改善内皮功能,增加胰岛素敏感性和 beta 细胞功能、减少氧化应激^[36]。维生素 D 缺乏在我国老年人中十分普遍^[37],建议老年糖尿病患者摄入足量维生素 D 降低衰弱的风险。

3 小结

老年糖尿病患者发生衰弱风险高,不仅表现为肌肉减少,也会增加机体功能缺陷、跌倒、认知障碍、抑郁和营养不良的风险。老年糖尿病患者应进行常规的营养评估和衰弱评估,保持适宜的体质量、充足的能量、适量蛋白质摄入对于糖尿病患者十分重要,n-3 PUFA 和维生素 D 也有利于减缓衰弱的进程。国外学者提出衰弱状态也可能是糖尿病治疗的副作用,包括体质量减轻、低血糖引起的认知障碍以及多重用药引起的抑郁症,因此提出基于衰弱程度制订不同血糖管理方案和治疗目标^[38]。国内最新版《老年糖尿病诊疗指南(2021)》虽然强调衰弱评估的重要性,但是并未提出老年衰弱患者管理的针对性推荐意见。目前国内对老年糖尿病伴衰弱患者的相关研究仍相对较少,未来还需更多高质量循证医学证据进一步探讨国内老年糖尿病伴衰弱患者的特定营养管理方案。

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