

脑卒中患者营养支持与评价

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【摘要】 脑卒中后营养支持可以明显改善脑卒中患者由于认知功能障碍、吞咽障碍、瘫痪、感觉运动障碍、视野缺损等原因导致的营养不良。但不规范的营养支持也可以导致肺感染、尿路感染等疾病增加。随着近年对肠内肠外营养支持研究的深入,越来越多的学者开始关注营养支持过程中胃肠道功能的评价和维护。为统一和规范脑卒中患者的营养管理,本文对脑卒中患者营养评定和胃肠功能评价常用方法进行综述,以期推动中国脑卒中患者营养管理体系的建立和完善。

【关键词】 卒中; 营养支持; 综述

Review of nutrition support and evaluation in stroke patients

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【Abstract】 Malnutrition is common after stroke, usually caused by cognitive disorder, dysphagia, paralysis, sensorimotor disability and visual field defect. Many researches indicate that the initiation of early enteral nutrition in stroke patients would own enormous clinical benefits, including a decrease in the risk of death and infectious diseases, shorter hospital stay and lower health expenditure. However, irregular nutrition management could increase the incidence of hypostatic pneumonia and urinary tract infection. Therefore, both European Society for Parenteral and Enteral Nutrition (ESPEN) and American Society for Parenteral and Enteral Nutrition (ASPEN) recommended that nutrition screening and assessment and nutrition support be initiated as soon as possible, preferably within 24 h of hospital admission, to improve clinical outcomes. Chinese neurologists and patients have accepted this concept and have done many worthwhile studies in the past few years. This paper summarized the common methods of nutrition assessment and measurement of interstitial barrier function, in order to monitor the nutritional status of stroke patients, and push the establishment and improvement of nutrition support system for stroke patients in China.

【Key words】 Stroke; Nutritional support; Review

脑卒中后由于认知功能障碍、吞咽障碍、瘫痪、感觉运动障碍、视野缺损等原因常影响患者营养摄入导致营养不良^[1]。营养不良又显著影响脑卒中患者预后^[2-3]。研究表明,8%~16%的急性脑卒中患者入院时已存在营养不良,其中50%在住院期间营养状况进一步恶化,住院时间超过3周,约80%急性脑卒中伴吞咽障碍患者可出现营养不良^[4]。脑卒中患者蛋白质消耗增加,加之营养不良、免疫功能降低,从而导致脑卒中后感染的病残率和病死率增加^[5]。

欧美国家公布的指南和专家共识均推荐对所有脑卒中患者进行营养风险筛查和评价,并采取相应措施,以改善患者营养状况。随着对肠内肠外营养支持研究的深入,在实施营养支持过程中,胃肠道本身的功能越来越受到各国学者的关注。为了提高临床医师对脑卒中患者的营养管理理念,本文对脑卒中患者营养支持筛查和评价,以及胃肠功能评价的常用方法进行综述,以期推动中国脑卒中患者营养管理实施体系的建立和完善。

一、急性脑卒中患者营养评定

美国肠外肠内营养学会(ASPEN)将“营养评定”定义为:采用以下方法综合诊断营养问题,包括病史、营养史、用药史、体格检查、人体测量学数据、实验室数据^[6]。营养评定是营养干预的基础,根据

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营养评定获得的信息确定患者是否需营养干预^[7]。营养评定由负责患者营养管理的临床营养师(国内目前应由临床医师)进行评价,包括主诉、既往史、饮食情况、人体测量学数据、实验室数据、日常生活活动能力(ADL)和经济条件,充分了解患者的营养需求,选择最合适的治疗方案。临床技能、资源可用性和配置决定了实施营养评定的具体方法^[8-9]。

目前,尚无国际公认的诊断脑卒中后营养不良的“金标准”,亦无专门用于评价脑卒中患者营养状况的工具^[10]。临床一般采用营养风险筛查 2002 (NRS2002)和微型营养评定(MNA)法进行营养筛查,判断是否需给予营养支持。若无营养风险,则定期(每周)筛查;若存在营养风险,则继续进行营养评定。

1. 营养风险筛查 2002 该项筛查工具由丹麦肠外肠内营养学会(DSPEN)研发,由欧洲肠外肠内营养学会(ESPEN)于 2002 年推荐用于成年住院患者的营养风险筛查^[11]。NRS2002 已经来自欧洲的 128 项随机对照试验证实其敏感性和特异性,但国内尚无大样本随机对照试验证实其有效性。共分为三部分:营养状况受损评分(0~3 分)、疾病严重程度评分(0~3 分)和年龄评分(≥ 70 岁加 1 分),总评分 ≥ 3 分者,存在营养不良风险,需营养支持。NRS2002 是目前唯一一项与疾病诊断相关的筛查工具。

2. 微型营养评定法 该方法是由 Vellas、Guigoz、Garry 等创立和发展起来的一种营养筛查工具^[11],简单、易操作,主要用于老年患者的营养风险评价。多项研究表明,MNA 法可较敏感地发现老年患者特别是老年肥胖患者的营养不良风险^[7,11-13],但其与老年患者特别是与中国老年患者预后之间的关系尚待进一步研究。

3. 主观全面评定法 该方法是一个主观评价工具,要求使用者接受专门的培训,并不适合作为常规营养筛查工具。主观全面评定(SGA)法主要适用于已存在营养不良的患者^[13-15]。ASPEN 推荐其用于患者的营养风险筛查。

4. 营养不良通用筛查工具 该筛查工具是由英国肠外肠内营养协会(BAPEN)多学科营养不良咨询小组研发的一种筛查工具。适用于所有住院患者,除医疗工作者外,非医疗工作者使用时也具有较高有效性。研究表明,营养不良通用筛查工具(MUST)评分与老年住院患者病死率和住院时间具

有相关性,可预测临床结局^[16]。该筛查工具操作简单、迅速,在临床上具有较高的实用性。

二、营养状况和胃肠功能评价

研究显示,早期给予脑卒中患者营养支持可以改善近期预后,降低营养不良发生率和病死率^[17]。急性脑卒中患者脑-肠轴功能损害可导致胃肠功能紊乱和肠黏膜完整性损害。因此,脑卒中急性期的营养支持不仅要考虑患者的全身情况,也要评价患者的胃肠功能,根据患者实际情况给予合理的营养管理。

1. 人体测量学数据 包括体重指数(BMI)、肱三头肌皮褶厚度(TSF)和上臂肌围(AMC)。(1)体重指数:是反映蛋白质能量、营养不良的可靠指标,且最为简单、实用,但不适用于水肿患者。体重指数(kg/m^2) = 体重(kg) / 身高²(m^2), < 18.50 为存在慢性蛋白质-能量营养不良。对于卧床的脑卒中患者而言,体重指数的测量较为困难,可以通过测量肱三头肌皮褶厚度和上臂肌围来推算脂肪和肌肉总量。(2)肱三头肌皮褶厚度:是反映身体脂肪含量的指标,简单易行,但需由经过专门训练的人员进行测量。于右上臂后面肩峰与鹰嘴连线的中点,夹取与上肢长轴平行的皮褶,纵向测量。男性 < 10 mm、女性 < 20 mm 为消瘦,男性 > 40 mm、女性 > 50 mm 为肥胖。(3)上臂肌围:可用于评价肌蛋白存储和消耗情况,计算公式为:上臂肌围(cm) = 上臂围(cm) - 肱三头肌皮褶厚度(cm) $\times \pi$ 。

2. 实验室指标 包括血清白蛋白、前白蛋白和转铁蛋白、视黄醇结合蛋白、淋巴细胞计数等。事实上,专家们建议,血清白蛋白和前白蛋白不能单独用于营养评定,因为本质上二者也是炎症反应标志物^[11,18-19]。

3. 胃肠道运动功能检查 目前,用于胃肠道运动功能检查的主要方法包括胃排空检测、胃肠电图、消化道压力测定、消化道 pH 值监测、放射学检查等。(1)胃排空检测:①超声检查。已广泛应用于胃排空和胆囊排空的测定^[20],超声检查与内镜检查相结合可以同时观察胃内结构和胃周围淋巴情况,成为研究胃运动障碍性疾病的主要手段。②放射性核素显像技术。可以准确了解食管通过时间、胃排空时间、小肠通过时间、胃食管反流、十二指肠胃反流,是检查胃肠道运动功能的“金标准”。该项技术准确、可靠、重复性好、非侵入性、符合生理要求,是理想的检查胃肠道运动功能的方法。(2)胃肠电

图:目前,应用较为成熟的是胃电图^[21],肠电图尚处于探索阶段。胃电图通过记录并分析胃电图频率、振幅、节律等以了解胃收缩活动情况^[22]。胃电图可对胃内电活动进行长时间的非侵入性检测。(3)消化道压力测定:通过检测胃肠道压力变化,较全面地评价胃肠道运动功能,包括括约肌压力和舒张情况(食管括约肌、下食管括约肌、幽门、回盲瓣、肛门),食管运动,胃窦、幽门、十二指肠运动,空肠、回肠、结肠运动,是较为可靠、准确的方法,对诊断胃肠道运动障碍性疾病有重要意义^[23]。(4)放射学检查:较常用的方法为透视和X线,透视可观察胃肠道蠕动,常用于胃肠穿孔和肠梗阻的诊断;X线可用于胃肠道穿孔、肠梗阻、外伤、腹腔和腹内脏器感染等的诊断,行X线检查前一般不清理胃肠道,最好开始于胃肠道治疗前,以保持腹部原有的病理生理学状态。结肠转运时间或排便造影可用于便秘的诊断。

4. 肠黏膜功能检测 业已经研究证实,除胃肠道疾病外^[24-25],其他系统疾病也可导致胃肠道功能障碍^[26-28]。目前,用于评价肠黏膜功能的方法主要包括三部分:肠黏膜完整性检测、肠黏膜功能受损主动评价、肠黏膜功能受损被动评价^[29]。(1)肠黏膜完整性检测:通过检测肠上皮细胞损伤程度或紧密连接损伤程度来评价肠黏膜完整性,包括脂肪酸结合蛋白(FABP)、谷胱甘肽S-转移酶类(GSTs)的测定。①脂肪酸结合蛋白。是小分子水溶性蛋白质,相对分子质量 $(14 \sim 15) \times 10^3$,可见于成熟小肠和大肠上皮细胞。当肠黏膜完整性受损时,易释放入循环系统并经肾脏快速清除(半衰期15分钟)^[30-31]。其检测方法有放射免疫法(RIA)、酶联免疫吸附试验(ELISA)、免疫比浊法。②谷胱甘肽S-转移酶类。其家族成员共包括4种亚型, α GST、 μ GST、 π GST和 θ GST^[32],具有保护细胞、抗氧化、解毒、使细胞内异物与谷胱甘肽结合的作用。研究显示,可疑急性肠系膜缺血患者通过检测血浆 α GST表达水平以确定是否存在肠系膜缺血^[33]。(2)肠黏膜功能受损主动评价:是指主动检测肠黏膜漏出的可检测物质。目前,最常用于评价肠黏膜通透性的糖分子探针是乳果糖和甘露醇或L-鼠李糖。其他分子探针包括相对分子质量不同的聚乙烯乙二醇(PEG)探针、放射性物质标记探针如铬标记的乙二胺四乙酸(⁵¹Cr-EDTA)探针。①糖分子探针。差异糖吸收率检测(DST)是根据口服的两种糖在肠黏膜受损后进入血液循环的通透性不同,此后在尿液中分别被清

除。口服两种糖后5~6小时,收集尿液,检测尿寡聚糖和单糖清除比,目前,该比值是反映小肠功能最准确的指标^[34]。通常实验室采用高效液相色谱法(HPLC)或液相色谱联合质谱分析检测该比值。②PEG探针。相对分子质量为 $(0.40 \sim 4) \times 10^3$,也可用于肠黏膜功能检测。在肠黏膜功能受损时,PEG能够透过肠上皮细胞进入血液循环^[35],这些糖类经肾脏滤过后,通过气相色谱法测定尿液中的表达变化。③⁵¹Cr-EDTA探针。⁵¹Cr-EDTA和寡聚糖有相似优势,即易于检测,但由于其放射性^[35],目前尚未在临床推广应用^[36]。⁵¹Cr-EDTA在克隆过程中不受细菌代谢的影响,利用这一特性可用于检测小肠和大肠黏膜通透性。(3)肠黏膜功能受损被动评价:是指被动检测肠黏膜功能受损的物质如由细胞内转运至血液循环内的物质。①血浆内毒素(endotoxin)及其抗体。内毒素是革兰阴性菌细胞壁表面的一种脂多糖(LPS)。多种因素可以导致人体中出现内毒素,轻致发热、白细胞计数增加,重致血小板计数减少和凝血功能障碍。鲎变形细胞溶解物试验可对血浆内毒素水平进行定量测定^[37]。②血清瓜氨酸(citrulline)。瓜氨酸是一种非蛋白质氨基酸,除西瓜外,其他食物中很少含有瓜氨酸,血清瓜氨酸水平主要受小肠生成的瓜氨酸影响,使其成为检测肠上皮细胞功能和数目的理想标志物。研究显示,除一氧化氮途径中的免疫细胞外^[38],小肠上皮细胞是唯一可以生成瓜氨酸的细胞。血清瓜氨酸水平可以反映小肠黏膜上皮细胞数目^[39-41],从而反映小肠功能。③血浆D-乳酸(D-lactate)。血浆D-乳酸是人类肠道多种细菌的固有产物,故可作为诊断细菌感染的标志物。多项研究表明,血浆D-乳酸与肠黏膜通透性明显相关^[42-43]。目前多采用改良的酶学分光光度法检验血浆D-乳酸水平^[29]。④血浆二胺氧化酶(DAO)及其活性。二胺氧化酶仅存在于成熟绒毛的顶端,且仅在此部位才具有活性^[44-45],可以反映小肠黏膜完整性和成熟度。多项研究表明,在人体和动物体内,血浆二胺氧化酶活性与小肠黏膜通透性具有相关性。因此,血浆二胺氧化酶活性是评价肠黏膜完整性和成熟度的可靠指标^[46-48]。

三、小结

脑卒中患者是营养不良的高危人群,规范营养支持是脑卒中治疗的一部分,也是提高脑卒中患者生活质量至关重要的措施。自2007年我国第一部针对脑卒中患者营养管理的专家共识公布以来^[49],

临床医师对脑卒中患者实施营养支持的问题得到改善。然而在临床实践中,患者胃肠道功能的实际状态仍待进一步研究和探讨。

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· 小词典 ·

中英文对照名词词汇(三)

卒中预防门诊 stroke prevention clinic(SPC)
 欧迪海姆-奇斯特病 Erdheim-Chester disease(ECD)
 欧洲肠外肠内营养学会
 European Society for Parenteral and Enteral Nutrition (ESPEN)
 欧洲颈动脉外科手术试验
 European Carotid Surgery Trial(ECST)
 欧洲与澳大利亚可逆性缺血性卒中预防试验
 European Stroke and Australian Stroke Prevention in Reversible Ischemia Trial(ESPRIT)
 前额叶背外侧皮质 dorsolateral prefrontal cortex(DLPFC)
 前瞻性城市农村流行病学研究
 Prospective Urban Rural Epidemiology (PURE) study
 腔隙性梗死 lacunar infarct(LACI)
 强制性运动疗法
 constraint-induced movement therapy(CIMT)

人类白细胞抗原组织相容性 DR 抗原
 human leukocyte antigen histocompatibility-DR antigen (HLA-DR)
 日常生活活动能力 activities of daily living(ADL)
 上臂肌围 arm muscle circumference(AMC)
 神经肌肉电刺激术
 neuromuscular electrical stimulation(NMES)
 肾素-血管紧张素系统 renin-angiotensin system(RAS)
 视黄醇结合蛋白 retinol-binding protein(RBP)
 视觉模拟情绪量表 Visual Analogue Mood Scale(VAMS)
 视频透视吞咽检查
 Video Fluoroscopic Swallowing Study(VFSS)
 室管膜下巨细胞型星形细胞瘤
 subependymal giant cell astrocytoma(SEGA)
 嗜酸性肉芽肿 eosinophilic granuloma(EG)