

· 临床研究 ·

MNA和NRS2002对老年住院患者营养评估的比较

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【摘要】目的 简易营养评价法(MNA)是专为老年人设计的营养评估方法, 而营养风险筛查2002(NRS2002)常用于住院患者, 本研究探讨哪一种营养评估方法更适用于老年住院患者。**方法** 本研究纳入了179名在内科老年病房住院的≥65岁的老年患者, 分别应用MNA简表(MNA-SF)和NRS2002进行营养风险评估, 比较两种筛查方法的评估结果以及对临床营养治疗的指导作用, 并分析与传统的临床营养指标相关性。**结果** MNA-SF评估, 营养不良危险者55例, 营养不良者42例, 总的营养风险异常率54.2%, 较NRS2002筛查(有营养风险69例, 38.5%)差异有统计学意义。MNA-SF筛查的营养不良危险组和营养不良组的营养治疗率分别为29.1%和50.0%, 而NRS2002的营养风险组的营养治疗率为49.3%。常用的营养指标体质量指数(BMI)、体质量变化、血清白蛋白和前白蛋白与两种营养评估结果的相关性低($r=0.09\sim0.48$), 上述指标的异常对营养风险筛查结果无可靠的提示作用。**结论** 内科住院老年患者的营养风险筛查, 同一个患者群体MNA-SF可发现较多具有营养风险的患者, 而NRS2002筛查结果异常对营养治疗的指导意义更大。常用的营养指标如BMI、血清蛋白不是可靠的营养风险筛查指标。

【关键词】 老年人; 营养评价; 肠道营养; 简易营养评价法; 营养风险筛查2002

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Comparison of malnutrition risk screening methods MNA and NRS 2002 in geriatric inpatients

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【Abstract】Objective To investigate which one out of the 2 most commonly used tools for screening malnutrition, Mini Nutritional Assessment (MNA, specially designed for the elderly) and nutritional risk screening 2002 (NRS 2002, usually for inpatients) is more suitable for the geriatric inpatients. **Methods** A total of 179 inpatients over 65 years old from geriatric ward in our hospital from July 2010 to January 2012 were enrolled in this study. All the patients were assessed with MNA-short form (SF) and NRS2002 within 48h after admission. The coincidence of the 2 tools was studied, and their efficiency of guiding the patients for nutritional support was compared. Meanwhile, the relationship of the nutritional status screened by the 2 methods with traditionally used nutritional indicators, i.e. body mass index (BMI), serum albumin and pre-albumin was analyzed. **Results** By MNA-SF, 55 cases (30.7%) were rated as at risk of malnutrition, and 42 cases (23.5%) were as malnutrition, which were significantly different from the results by NRS2002 (69 cases as at risk of nutrition, 38.5%). MNA-SF had an efficiency of 29.1% for the patients at risk of malnutrition, and of 50% for those of malnutrition, and NRS 2002 had an efficiency of 49.3%. Besides, the commonly used nutritional indicators BMI, serum albumin and pre-albumin showed little correlation with the results rated by MNA-SF and NRS2002 ($r=0.09$ to 0.48), indicating that these indicators had no reference value for nutritional risks screening. **Conclusion** In the nutritional risks screening for geriatric inpatients in department of internal medicine, MNA-SF is a relatively sensitive tool for screening nutritional risks, while, NRS2002 has a better value in the guidance for the patients needing for nutritional therapy. The conventionally used nutritional indicators such as BMI, serum albumin and pre-albumin are not reliable or effective factors for screening nutritional risks in the elderly.

【Key words】 aged; nutrition assessment; enteral nutrition; mini-nutritional assessment; NRS2002

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营养不良是常见的老年问题,与不良预后密切相关。国内外资料显示住院老年患者的营养不良及其风险发生率在50%~70%,但常常被漏诊漏治,国内大规模研究提示营养治疗率仅在30%左右。为改变上述现状,对住院的老年患者应该常规进行营养风险筛查,但应该采用哪一种营养风险评估方法呢?简易营养评价法(Mini Nutritional Assessment, MNA)是专门为老年人设计的有效营养不良危险评估方法,具有很高的临床敏感度和特异度,分别为96%和98%^[1,2],但MNA由18个问题构成,耗时10~15min,并且需要患者进行主观自我评价以及膳食定性和定量评价,应用在具有认知功能和交流障碍患者身上也有难度。改良的简易营养评价法简表(Mini Nutritional Assessment Short Form, MNA-SF)提取其中的6项,并采用小腿围代替身体质量指数(body mass index, BMI),应用简便,且敏感性和特异性与MNA完整版相当^[2,3]。营养风险筛查2002(Nutrition Risk Screening-2002, NRS-2002)是一个在住院患者中广为使用的营养风险筛查工具,能快速、简便地发现需要给予营养支持治疗的患者^[4]。另外,临床工作中,常常简单地应用BMI、血清白蛋白和前白蛋白水平来判断患者营养状态。本研究目的是探讨MNA-SF和NRS2002哪一种更适用于内科老年住院患者,并探讨常用的营养指标对营养风险评估的效能。

1 对象与方法

1.1 对象

纳入179例在2010年7月至2012年1月间新收入北京协和医院老年示范病房的老年患者(≥ 65 岁),其中男性87例,女性92例,年龄(76.7 ± 7.3)岁,患有(5.6 ± 2.4)种慢性疾病,住院日(18.9 ± 16.2)d。

1.2 方法

1.2.1 营养风险评估 在入院48h内分别应用MNA-SF和NRS2002进行营养风险评估。评分标准:MNA-SF评分 > 11 分为营养正常,8~11分为有营养不良风险, ≤ 7 分为营养不良。NRS2002经年龄校正后的总分 ≥ 3 分为有营养风险。

1.2.2 决定是否进行营养干预 在住院期间,临床医师根据患者病情和营养情况、而不是根据MNA-SF或NRS2002营养评估的结果来决定是否进行营养干预。

1.2.3 检查 入院48h内测定BMI,并检查血清白蛋白(albumin, ALB)和前白蛋白(prealbumin, PA)。

1.3 统计学处理

采用SPSS16.0软件对数据进行统计分析、处理。计量资料以均数 $\pm$ 标准差表示,比较采用 t 检验或方差检验,计数资料采用卡方检验。以 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 两种营养筛查结果的比较

采用MNA-SF方法进行评估,营养不良风险的发生率30.7%;营养不良发生率为23.5%,总的异常率为54.2%。而应用NRS2002进行筛查,有营养风险者69例,营养风险发生率为38.5%。两种筛查方法评估结果,经 χ^2 分析,差异有统计学意义($\chi^2 = 44.414, P < 0.0001$;表1)。同一个患者群体,MNA-SF评定为营养风险/营养不良的患者明显多于NRS2002。

表1 MNA-SF与NRS2002的筛查结果

Table 1 The results rated by MNA-SF and NRS2002 (n)

Group	NRS-N	NRS-NR
MNA-N	68	14
MNA-MR	33	22
MNA-M	9	33

MNA-SF: Mini Nutritional Assessment Short Form; NRS-2002: Nutrition Risk Screening-2002; MNA-N: Normalized by MNA-SF; MNA-MR: Malnutrition Risk by MNA-SF; MNA-M: Malnutrition by MNA-SF; NRS-N: Normalized by NRS2002; NRS-NR: Nutritional Risk by NRS2002

2.2 两种营养筛查对临床营养治疗指导的特异性

临床医师根据患者的病情和营养情况,共对45例患者进行营养干预治疗。两种营养风险评估的结果和相应的营养治疗情况,详见表2。各亚组间的营养治疗率差异均有统计学意义,在对临床营养治疗的指导方面,50.0%的MNA-SF评估为营养不良组患者与49.3%的NRS2002评估为有营养风险组患者接受了营养治疗,而29.1%的经MNA-SF评估为有营养不良风险组接受了营养治疗。

2.3 两种营养筛查结果与体质量及其变化的相关性分析

2.3.1 BMI BMI是衡量人营养状态的重要参数,在本研究中,有18例患者未测体质量。BMI均值在各亚组间比较差异均有统计学意义(表3);按国人的BMI标准进行分组,MNA-SF的各亚组间($\chi^2 = 40.504, P < 0.0001, r = 0.20$)和NRS2002的各亚组间($\chi^2 = 49.182, P < 0.0001, r = 0.48$)比较差异也有统计学意义,但BMI与两种方法评估结果相关性差(表3)。多数患者的BMI正常,BMI低下(< 18.5)对两种评估方法的评估结果无可靠的提示作用。

表2 MNA-SF和NRS2002评估各亚组的营养治疗情况
Table 2 Nutritional therapy of subgroups rated by the MNA-SF and NRS2002 [n(%)]

Group	n	No therapy	Nutritional therapy
MNA-N	82	74 (90.2)	8 (9.8)
MNA-MR	55	39 (70.9)	16 (29.1)
MNA-M*	42	21 (50.0)	21 (50.0)
NRS-N	110	99 (90.0)	11 (10.0)
NRS-NR*	69	35 (50.7)	34 (49.3)

MNA-SF: mini nutritional Assessment Short Form; NRS-2002: Nutrition Risk Screening-2002; MNA-N: Normalized by MNA-SF; MNA-MR: Malnutrition Risk by MNA-SF; MNA-M: Malnutrition by MNA-SF; NRS-N: Normalized by NRS2002; NRS-NR: Nutritional Risk by NRS2002. *Subgroups of MNA-SF: $\chi^2 = 24.56, P < 0.0001$; #Subgroups of NRS2002: $\chi^2 = 34.76, P < 0.0001$.

2.3.2 体质量变化 也是人体营养状态改变和营养风险筛查的重要指标。本研究中有16例患者体质量变化不详。体质量变化情况在两种评估的各亚组间比较差异均有统计学意义,但相关性小(表4)。但本研究中多数患者无明显体质量变化,仅35.7%的MNA-SF的营养不良组患者和29.0%NRS2002评估的营养风险组患者有体质量下降。

2.4 两种营养筛查结果与血清营养指标的相关性分析

2.4.1 血清ALB水平 本研究中有30例血ALB化验数据缺失。血清ALB均值在两种评估的各亚组间比较差异有统计学意义(表5)。以住院患者低血清ALB标准($< 35\text{g/L}$)分组,进行 χ^2 检验, MNA-SF的各亚组间($\chi^2 = 16.006, P < 0.0001, r = 0.097$)和NRS2002各亚组间($\chi^2 = 19.685, P = 0.001, r = 0.117$)比较差异均有统计学意义,但相关性较小。

2.4.2 血清PA水平 本研究中有11例患者的化验数据缺失,血清PA均值在两种评估的各亚组间比较有统计学差异(表6)。而根据共识推荐的血清PA的危险分层标准($\geq 150\text{mg/L}$, $110 \sim 150\text{mg/L}$ 和 $< 110\text{mg/L}$)^[5]分组并进行 χ^2 统计,血清PA与MNA-SF的各亚组间($\chi^2 = 27.033, P < 0.0001, r = 0.37$)和NRS2002的亚组间($\chi^2 = 29.155, P < 0.0001, r = 0.38$)

比较差异有统计学意义,但与两种方法的营养风险评估结果的相关性小。血清PA中重度降低 $PA < 150\text{mg/L}$ 对营养风险评估也无可靠的提示作用。

3 讨论

老年人的住院管理需要纳入营养风险评估以指导营养干预治疗,对于营养风险筛查方法,本研究的结果提示同一组患者应用MNA-SF和NRS2002两种方法评估,其结果差异有统计学意义, MNA-SF评估发现有营养不良风险患者明显多于NRS2002筛查,但在指导临床营养干预治疗的特异性方面, NRS2002高于MNA-SF。国外多项MNA和NRS2002的对比研究也有类似发现^[6-10],但也有研究提示NRS较MNA可发现更多的有营养风险的住院老年患者,更适用于急性住院患者,对营养支持治疗的指导意义更大^[11,12]。究其原因,与这两个量表的纳入参数有关, MNA-SF纳入患者近3个月的BMI、体质量下降、因食欲、消化和咀嚼功能引起的食量变化、活动能力、精神心理疾病和急性疾病应激情况^[11]。而NRS2002仅考虑患者的体质量、BMI、近1周内进食量、疾病应激和年龄^[4],纳入的参数较少,故对老年人的营养不良的筛查敏感性较MNA-SF低,但NRS2002纳入的因素均是可反映患者营养状态和能量供需盈亏的直接指标,而住院患者的营养管理也更多的是关注患者的营养供需平衡,要评价的是否需要给予营养支持治疗,故NRS2002更适用于指导住院患者的营养支持治疗。而MNA及MNA-SF则因纳入功能评估,能发现潜在的致营养不良危险因素,更适用于社区和机构内的老年人的营养评估^[11,13],有利于对营养不良患者进行全面综合管理。另外,本研究对患者的营养治疗决策是基于医师对其临床情况的判断,可能存在一定的局限性。

另外,临床工作中常用人体测量数据和血液生化指标来判断患者营养状态。本研究提示BMI、体质量下降、血清ALB和PA与营养风险评估结果的相关性很低。国外也有类似的报道, MNA评估结果与血清

表3 两种营养筛查结果与BMI的相关分析
Table 3 BMI in subgroups rated by MNA-SF and NRS2002

Group	n	BMI ($\text{kg/m}^2, \bar{x} \pm s$)	BMI $< 18.5\text{kg/m}^2$ [n(%)]	BMI $18.5 \sim 24.0\text{kg/m}^2$ [n(%)]	BMI $24.0 \sim 28.0\text{kg/m}^2$ [n(%)]	BMI $> 28.0\text{kg/m}^2$ [n(%)]
MNA-N	81	25.7 ± 3.8	1 (1.2)	22 (27.2)	39 (48.1)	19 (23.5)
MNA-MR	51	22.9 ± 5.7	5 (9.8)	21 (41.2)	19 (37.3)	6 (11.8)
MNA-M	29	$19.6 \pm 7.6^{***}$	7 (24.1)	12 (41.4)	6 (20.7)	4 (13.8)
NRS-N	101	25.8 ± 0.3	0 (0.0)	29 (28.7)	47 (46.5)	25 (24.8)
NRS-NR	57	$20.1 \pm 0.9^{###}$	13 (22.8)	24 (42.1)	17 (29.8)	3 (5.3)

MNA-SF: Mini Nutritional Assessment Short Form; NRS-2002: Nutrition Risk Screening-2002; MNA-N: Normalized by MNA-SF; MNA-MR: Malnutrition Risk by MNA-SF; MNA-M: Malnutrition by MNA-SF; NRS-N: Normalized by NRS2002; NRS-NR: Nutritional Risk by NRS2002; BMI: body mass index. ***Subgroups of MNA-SF: $F = 13.7, P < 0.0001$; ###Subgroups of NRS2002: $F = 15.1, P < 0.0001$

表4 MNA-SF和NRS2002筛查各亚组的体质量变化
Table 4 Change in body mass in subgroups rated by MNA-SF and NRS2002 [n(%)]

Group	n	No data	No change	Losing	Gaining
MNA-N	82	3 (3.7)	65 (79.3)	12 (14.6)	2 (2.4)
MNA-MR	55	3 (5.5)	39 (70.9)	13 (23.6)	0 (0.0)
MNA-M ^{***}	42	10 (23.8)	16 (38.1)	15 (35.7)	1 (2.4)
NRS-N	110	9 (8.2)	80 (72.7)	20 (18.2)	1 (0.9)
NRS-NR [#]	69	7 (10.1)	40 (58.0)	20 (29.0)	2 (2.9)

MNA-SF: Mini Nutritional Assessment Short Form; NRS-2002: Nutrition Risk Screening-2002; MNA-N: Normalized by MNA-SF; MNA-MR: Malnutrition Risk by MNA-SF; MNA-M: Malnutrition by MNA-SF; NRS-N: Normalized by NRS2002; NRS-NR: Nutritional Risk by NRS2002. ^{***}Subgroups of MNA-SF: $\chi^2 = 27.81$, $P < 0.0001$, $r = 0.38$; [#]Subgroups of NRS2002: $\chi^2 = 4.77$, $P = 0.189$, $r = 0.17$.

表5 MNA-SF和NRS2002筛查结果与血清白蛋白的相关性分析
Table 5 Comparison of ALB level in subgroups rated by MNA-SF and NRS2002

Group	n	ALB (g/L, $\bar{x} \pm s$)	ALB < 35g/L [n(%)]	ALB $\geq$ 35g/L [n(%)]
MNA-N	71	38.62 $\pm$ 4.68	11 (15.5)	60 (84.5)
MNA-MR	43	38.62 $\pm$ 4.23	11 (25.6)	32 (74.4)
MNA-M	35	33.50 $\pm$ 5.77 ^{***}	19 (54.3)	16 (45.7)
NRS-N	87	38.44 $\pm$ 4.00	14 (16.1)	73 (83.9)
NRS-NR	59	34.28 $\pm$ 5.86 ^{###}	27 (45.8)	32 (54.2)

MNA-SF: Mini Nutritional Assessment Short Form; NRS-2002: Nutrition Risk Screening-2002; ALB: albumin; MNA-N: Normalized by MNA-SF; MNA-MR: Malnutrition Risk by MNA-SF; MNA-M: Malnutrition by MNA-SF; NRS-N: Normalized by NRS2002; NRS-NR: Nutritional Risk by NRS2002. ^{***}MNA-M and MNA-N: $F = 15.495$, $P < 0.0001$; ^{###}Subgroups of NRS2002: $F = 30.966$, $P < 0.0001$.

表6 两种营养筛查结果与血清白蛋白的相关性分析
Table 6 Comparison of PA level in subgroups rated by MNA-SF and NRS2002

Group	n	PA (mg/L, $\bar{x} \pm s$)	PA < 110 [n(%)]	PA 110–149 [n(%)]	PA $\geq$ 150 [n(%)]
MNA-N	78	205.82 $\pm$ 61.48	6 (7.7)	9 (11.5)	63 (80.8)
MNA-MR	49	180.49 $\pm$ 52.05	6 (12.2)	6 (12.2)	37 (75.5)
MNA-M	41	147.71 $\pm$ 73.065 ^{**}	17 (41.5)	4 (9.8)	20 (48.8)
NRS-N	101	205.94 $\pm$ 54.47	6 (5.9)	8 (7.9)	87 (86.1)
NRS-NR	67	150.73 $\pm$ 68.45 ^{###}	23 (34.3)	11 (16.4)	33 (49.3)

MNA-SF: Mini Nutritional Assessment Short Form; NRS-2002: Nutrition Risk Screening-2002; PA: prealbumin; MNA-N: Normalized by MNA-SF; MNA-MR: Malnutrition Risk by MNA-SF; MNA-M: Malnutrition by MNA-SF; NRS-N: Normalized by NRS2002; NRS-NR: Nutritional Risk by NRS2002. ^{**}Subgroups of MNA-SF: $F = 11.926$, $P < 0.0001$; ^{###}Subgroups of NRS2002: $F = 33.565$, $P < 0.0001$.

ALB和PA均不相关^[12]。毫无疑问,上述指标可反映患者的营养状态,而营养不良状态和营养不良风险是两个概念,MNA和NRS2002除了关注营养不良状态同时也评估营养风险。临床工作中,不但要治疗营养不良,更要对存在营养不良风险的患者尽早进行干预,因此正规的营养评估对临床指导意义更大。

总之,对内科住院的老年患者,MNA-SF可以发现较多具有营养风险的患者,而NRS2002则对老

年患者的营养治疗的指导意义更大,常用的营养指标如BMI、血清ALB和PA对患者的营养风险筛查无可靠的提示作用。

【参考文献】

- [1] Guigoz Y, Lauque S, Vellas BJ. Identifying the elderly at risk for malnutrition. The Mini Nutritional Assessment[J]. Clin Geriatr Med, 2002, 18(4): 737–757.
- [2] Guigoz Y. The Mini Nutritional Assessment (MNA) review of the literature—What does it tell us[J]? J Nutr Health Aging, 2006, 10(6): 466–485; discussion 485–487.
- [3] Kaiser MJ, Bauer JM, Ramsch C, et al. MNA-International Group. Validation of the Mini Nutritional Assessment Short-Form (MNA-SF): a practical tool for identification of nutritional status[J]. J Nutr Health Aging, 2009, 13(9): 782–788.
- [4] Kondrup J, Rasmussen HH, Hamborg O, et al. Nutritional Risk Screening (NRS 2002): a new method based on an analysis of controlled clinical trials[J]. Clin Nutr, 2003, 22(3): 321–336.
- [5] Bernstein L, Bachman TE, Meguid M, et al. Measurement of visceral protein status in assessing protein and energy malnutrition: standard of care. Prealbumin in Nutritional Care Consensus Group[J]. Nutrition, 1995, 11(2): 169–171.
- [6] Söderhamn U, Flateland S, Jessen L, et al. Perceived health and risk of undernutrition: a comparison of different nutritional screening results in older patients[J]. J Clin Nurs, 2011, 20(15–16): 2162–2171.
- [7] Lomivorotov VV, Efremov SM, Boboshko VA, et al. Evaluation of nutritional screening tools among patients scheduled for heart valve surgery[J]. J Heart Valve Dis, 2013, 22(2): 239–247.
- [8] Velasco C, García E, Rodríguez V, et al. Comparison of four nutritional screening tools to detect nutritional risk in hospitalized patients: a multicentre study[J]. Eur J Clin Nutr, 2011, 65(2): 269–274.
- [9] Neelemaat F, Meijers J, Kruijenga H, et al. Comparison of five malnutrition screening tools in one hospital inpatient sample[J]. J Clin Nurs, 2011, 20(15–16): 2144–2152.
- [10] Raslan M, Gonzalez MC, Dias MC, et al. Comparison of nutritional risk screening tools for predicting clinical outcomes in hospitalized patients[J]. Nutrition, 2010, 26(7–8): 721–726.
- [11] Sieber CC. Nutritional screening tools—How does the MNA compare? Proceedings of the session held in Chicago May 2–3, 2006 (15 Years of Mini Nutritional Assessment)[J]. J Nutr Health Aging, 2006, 10(6): 488–492; discussion 492–494.
- [12] Drescher T, Singler K, Ulrich A, et al. Comparison of two malnutrition risk screening methods (MNA and NRS 2002) and their association with markers of protein malnutrition in geriatric hospitalized patients[J]. Eur J Clin Nutr, 2010, 64(8): 887–893.
- [13] Phillips MB, Foley AL, Barnard R, et al. Nutritional screening in community-dwelling older adults: a systematic literature review[J]. Asia Pac J Clin Nutr, 2010, 19(3): 440–449.

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