Comparison of nutritional evaluation scores in frail elderly with care needs

Martina Jeske[a], Michael Joannidis[b], Rafaella Matteucci Gothe[a], Oliver Galvan[c], Hans-Christian Jeske[d] and Johann Michael Hackl[a]

a Unit for Medical Basics and Nutritional Sciences, University for Health Sciences, Medical Informatics and Technology UMIT, Hall, Austria
b Department of General Internal Medicine, ICU, Innsbruck Medical University, Innsbruck, Austria
c Department of Otorhinolaryngology, Innsbruck University Hospital, Innsbruck, Austria
d Department of Traumatology and Sports Medicine, Innsbruck Medical University, Innsbruck, Austria

INTRODUCTION

- We wanted to know, if the Mini-Nutritional Assessment MNA and Nutritional Risk Screening NRS 2002 are able to predict the need for nursing care in geriatric patients.
- NRS 2002 was evaluated since geriatric patients often show multiple morbidity and hospital stays are often prolonged.
- To address this issue, we analysed the relationship between health status and level of independence shown through the need for nursing care and the nutritional status assessed by MNA and NRS 2002 in a cross-sectional study in five nursing homes (1,3).
- Since data on nursing home patients in Austria and the use of these screening tools are still limited, we wanted to obtain information about the nutritional status of long term care patients and evaluate the characteristics of these scoring instruments.

METHODS

- The study population (n=272, 79.4% women) comprised elderly (mean age=84.4±8.9) persons living in five nursing homes in western Austria.
- Nutritional status was assessed using the Mini-Nutritional Assessment and Nutritional Risk Screening 2002 (2) .
- Health status and level of independence was determined by level of nursing care required, defined by treating physician according to the Austrian nursing care allowance act [Table 1].

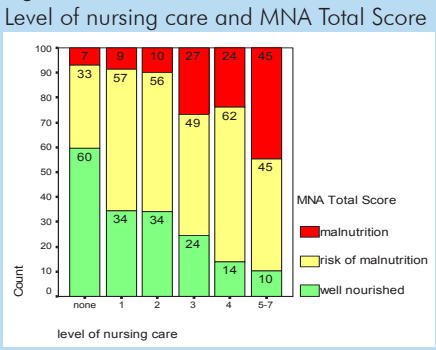
RESULTS

- Using Mini-Nutritional Assessment 18.7% were regarded as malnourished, 49.8% were at risk for malnutrition and 31.5% were well-nourished [Table 2].
- Malnutrition was significantly higher in patients classified in a higher level of nursing care.

CONCLUSIONS

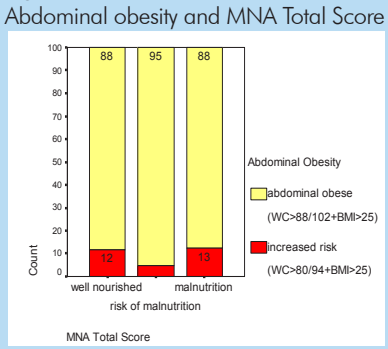
- Health status and level of independence correlate significantly with the nutritional status using Mini-Nutritional Assessment and Nutritional Risk Screening 2002 [Fig 1].
- Although the two scoring systems showed no statistically significant differences in their results, Mini-Nutritional Assessment covers a broad spectrum of items which are relevant for nutritional status in elderly [Table 4, Fig 4].
- The full MNA is best used in ill elderly with a high likelihood of malnutriton, since according to this result some patients at risk for malnutrition would remain undetected [Table 3, Fig 3].
- Waist circumference and Body Mass Index are not sufficient as solitary tools to evaluate nutritional status in elderly patients [Fig 2].
- A consequent systematic screening of all elderly patients using Mini-Nutritional-Assessment is required to define the risk of malnutrition.

Fig.1:
Level of nursing care and MNA Total Score



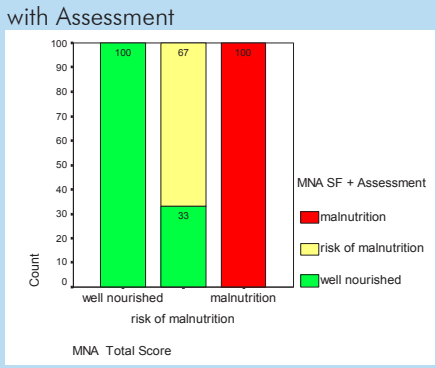
There was a negative monotone correlation between both MNA and Short-MNA and the level of nursing care required (rs = -0.447, P=0.000 respectively rs = -0.363, p=0.000)

Fig.2:
Abdominal obesity and MNA Total Score



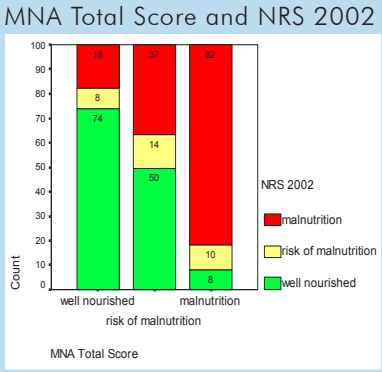
There was a positive monotone correlation between waist circumference (WC) and MNA Total Score (rs = 0.219, p=0.001), whereas Pearson Chi-Square showed no significant correlation between the screening for abdominal obesity and MNA Total Score (Chi-Square = 2.361, df=2, p=0.307) .

Fig.3:
MNA Total Score and MNA Short Form with Assessment



The results of MNA Total Score and MNA Screening plus Assessment (Short-MNA; if the score is 12 or greater, the patient is not at risk and the rest of the questionnaire is not completed) using Bowker test differed from each other significantly (p=0.000). The reliability was estimated with a Kappa=0.746.

Fig.4:
MNA Total Score and NRS 2002



The results of MNA Total Score and NRS 2002 final screening did not differ from each other significantly using Bowker test (p=0.804), reliability was estimated with a Kappa=0.235

Table 1: Levels of nursing care according to the Austrian nursing care allowance act

Level	Needed care in hours per month and additional aggravating conditions
Level 1:	>50h
Level 2:	>75h
Level 3:	>120h
Level 4:	>160h
Level 5:	>180h and exceptionally effort in care, stand-by for emergency duties
Level 6:	>180h and constant attendance of nursing staff necessary because it is not possible to co-ordinate the timing of the needed care, which is routine during day and night time or patient is an imminent danger for himself or others
Level 7:	>180h and no purposeful co-ordination of all four extremities possible or comparable situation (Technical equipment is indispensable for life, e.g. respirator)

Table 2: Basic data and nutritional measurements in geriatric patients classified as well nourished (WN), risk of malnutrition (RM) and malnutrition (M) according to Mini-Nutritional Assessment (MNA) and Nutritional Risk Screening 2002 (NRS 2002)

Subject characteristics	MNA			NRS 2002		
	WN n=84	RM n=133	M n=50	WN n=132	RM n=30	M n=110
Sex distribution (%)						
Male	21,4%	12.8%	18%	17.4%	30%	10.9%
Female	78,6%	87.2%	82%	82.6%	70%	89.1%
Age (mean± SD)	83.6±9.3	84.9±8.0	84.2±9.4	84.1±8.7	80.4±11.3	85.8±7.7
Weight kg (mean± SD)	67.5±11.5	63.8±13.3	57.3±16.4	67.0±12.1	71.6±15.9	57.0±12.7
BMI kg/m² (mean± SD)	29.0±5.3	27.1±5.7	23.4±6.3	28.5±5.6	29.7±5.8	24.2±5.6
WC cm (mean± SD)	100.9±10.5	97.8±11.1	95.1±15.2	100.0±11.01	103.3±14.5	94.6±10.9
MAC cm (mean± SD)	27.9±3.1	27.1±3.9	25.3±4.0	27.9±3.4	28.1±3.0	25.5±4.0
CC cm (mean± SD)	36.9±4.5	35.0±5.2	34.3±6.8	35.9±5.0	38.2±6.6	34.1±5.0

Table 3: Correlations of MNA questions to total MNA score and Short-MNA° (n =267)

MNA question	MNA Spearman´s r	MNA P-values	MNA-SF° Spearman´s r	MNA-SF° P-values
R Calf Circumference CC	0.550	***	0.434	***
C Mobility°	0.542	***	0.542	***
Q Midarm Circumference MAC	0.507	***	0.429	**
B Weight loss during the last 3 month°	0.478	***	0.553	***
F Body Mass index°	0.476	***	0.553	***
D Psychological stress or acute disease during the last 3 month°	0.448	***	0.582	***
O self few of nutritional status	0.432	***	0.361	***
P self view of health status	0.406	***	0.200	**
A Anorexia: food intake declined°	0.375	***	0.414	***
N Mode of feeding	0.369	***	0.250	***
E Neuropsychological problems°	0.349	***	0.337	***
G Lives independently	0.326	***	0.181	**
I Pressure scores or skin ulcer	0.260	***	0.118	0.053
H More than 3 prescription drugs per day	0.252	***	0.149	*
M Consumption of fluid	0.221	***	0.094	0.122
K Protein intake	0.086	0.159	0.024	0.691
J Number of eaten meals per day	0.082	0.180	0.030	0.625
L Consumption of Fruits and vegetables	-0.024	0.699	-0.140	0.021

*** P< 0.001; ** P < 0.01; *P < 0.05

Table 4: Frequencies of MNA-questions and NRS 2002 Initial Screening and NRS 2002 Final Screening

MNA question	NRS 2002 Initial Screening χ^2; df	NRS 2002 Initial Screening P-values	NRS 2002 Final Screening χ^2; df r	NRS 2002 Final Screening P-values
A Anorexia: food intake declined°	27.978; 2	***	33.725; 4	***
B Weight loss during the last 3 month°	73.491; 3	***	33.725; 4	***
C Mobility°	15.948; 2;	***	27.025; 4	***
D Psychological stress or or acute disease during the last 3 month	15.661; 1;	***	15.821; 2	***
F Body Mass index°	34.059; 3	***	59.725; 6	***
Q Midarm Circumference MAC	28.383; 2	***	34.014; 4	***
O self few of nutritional status	(17.909; 2)	(***)	(23.051; 4)	(***)
R Calf Circumference CC	8.426, 1	**	12.734; 2	***
E Neuropsychological problems°	8.166; 2;	*	8.936; 4	0.063
N Mode of feeding	7.099; 2	*	12.086; 4	*
P self view of health status	8.020; 3	*	15.336; 6	*
H More than 3 prescription drugs per day	1.648; 1	0.199	2.036; 2	0.361
J Number of eaten meals per day	(3.048; 2)	(0.218)	(5.391; 4)	(0.249)
M Consumption of fluid	1.360; 2	0.507	13.340; 4	*
L Consumption of Fruits and vegetables	0.228; 1	0.533	6.696;2	*
K Protein intake	0.173; 2	0.917	0.261; 4	0.992
G Lives independently	0.002; 1	0.967	1.900; 2	0.387
I Pressure scores or skin ulcer	0.000; 1	0.987	3.364; 2	0.186

*** P< 0.001; ** P < 0.01; *P < 0.05 (>25%of the cells have expected count less than 5)

References: 1.Guigoz et al. (2002), Clin Geriatr Med.18(4):737-57. 2. Kondrup et al. (2003), Clin Nutr. 22(4):415-21. 3. Izawa et al. (2006), Clin Nutr. 25(6):962-7.

Support: FWF 17109, University of Innsbruck.