Comparative Nutrition Evaluation with the Mini Nutritional Assessment and the Nutritional Risk Assessment Scale

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Malnutrition in geriatric hospital inpatients over 75 years old is one of the strongest indicators of a poor outcome, including mortality. A subjective rating of the nutritional status correlated strongly (p < 0.001) with the subsequent mortality at follow-up times of 6, 18, and 30 months after discharge from hospital. Mortality was twice as high in malnourished patients as in normally nourished patients and four times higher than in overweight patients [1]. We therefore developed an assessment of nutritional risk in order to identify possible nutritional interventions; this also included risk indicators for the future development of malnutrition owing to factors that might be related to the hospital admission itself [2]. In the present study we compared our nutritional assessment – the nutritional risk assessment scale (NuRAS) – with the Mini Nutritional Assessment (MNA) [3].

Patients and Methods

All patients, admitted consecutively to one acute geriatric and one rehabilitation ward, were eligible for the study; both assessments were performed by one interviewer during the first three days after admission. Drug treatments and body weight were taken from the patients’ records, and height was calculated from the knee-heel distance.

The MNA was performed after Guigoz et al. [3], and the NuRAS as described by Nikolaus et al. [2] (Table 1). In the MNA, points are given for positive nutrition factors, resulting in a high score for good nutritional status (24 points or more), an intermediate risk zone (17–23.5 points), and a low score <17 indicating malnutrition. The NuRAS assessment simply identifies single risk factors that
Table 1. Yes/no questions of the Nutritional Risk Assessment Scale [2]

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
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<tr>
<td>1. Has the patient a gastrointestinal disorder?</td>
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<td>2. Has the patient a chronic disease with pain?</td>
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<td>3. Has the patient swallowing problems?</td>
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<td>4. Has the patient difficulty in cutting food?</td>
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<td>5. Has the patient a gait disorder?</td>
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<td>6. Does the patient report an unexpected weight loss (&gt;5 kg during the last 6 months)?</td>
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<td>7. Does the patient complain of poor appetite or change in appetite?</td>
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<td>8. Does the patient show poor oral health or chewing problems?</td>
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<td>9. Is the patient taking five or more prescription drugs and/or has a high consumption of alcohol (&gt;3 drinks/day for a man, 1 drink/day for a woman) or of cigarettes (&gt;10 cigarettes/day)?</td>
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<td>10. Does the patient show clinical evidence of mental/cognitive impairment?</td>
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<td>11. Does the patient show clinical evidence of depressive illness?</td>
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<tr>
<td>12. Does the patient suffer from social isolation?</td>
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could result in nutritional interventions. For example, problems with teeth, swallowing, digestion, or loss of weight are analyzed separately, while in the MNA they are summarized under “anorexia.”

**Results**

Of 55 potential subjects, 50 could be included in the study (two refused, in one the anthropometric data could not be obtained, and two were not able to answer the questions because of aphasia). The average age of the participants was 78.4 years (range 59–95), 34 were female and 16 male, 34 were from the acute geriatric ward and 16 from the rehabilitation ward. Their average height was 159.5 cm (range 132–183) and their weight 65.3 kg (38.9–105.2), resulting in a mean body mass index of 26.5 kg/m² (13.9–41.6).

The risk scores in the two assessments correlated highly ($p < 0.01$), especially in the upper (normal) and lower (malnutrition) range of the MNA; variability was greatest in the intermediate risk zone of the MNA in comparison with the NuRAS risk factors (Fig. 1). If the simple subjective judgment of the physician was plotted against the MNA total score (Fig. 2), all patients classified as cachectic scored <17 points on the MNA and the majority of patients subjectively rated as undernourished scored <17 points, only three were in the risk zone, and none scored in the normal zone.

The time required for the performance of the assessments was highly variable. The MNA tended to be more time-consuming (about double the time), mainly because of the anthropometric measurements. In NuRAS, the question relating to the social situation needed a lot of time to answer for some patients. The NuRAS can be performed in 5–10 min.
Fig. 1. Risk factors NuRAS against points in the MNA; vertical bars mark the risk zone of the MNA.

Fig. 2. MNA points plotted against subjective classification of nutritional status in (1) obese, (2) normal, (3) undernourished, and (4) cachectic patients.
From the MNA scores there was a total of 31 possible nutrition interventions, and from the NuRAS, 26; this amounted overall to 548 nutritional interventions resulting from the MNA and 434 resulting from the NuRAS.

**Discussion**

In geriatric medicine, malnutrition is a strong indicator of poor outcome, including increased mortality, for many diseases. In institutionalized elderly patients, it is one of the most prevalent health problems [1, 4, 5]. Therefore every effort must be made to diagnose undernutrition. In this study we showed that a simple clinical assessment of nutritional status by the physician, classifying the patient as cachectic, undernourished, normally nourished, or overnourished, can be as good as a battery of biochemical and anthropometric tests [6]. Despite the ease of the diagnosis, malnutrition is still one of the most neglected problems in geriatric medicine. Because of this, formal assessment procedures like the MNA and the NuRAS have been developed, which are able to combine a nutritional diagnosis with suggestions for possible nutritional intervention. The time required to do these tests can be as short as 5 min, especially when incorporated in a comprehensive geriatric assessment.

In our study, 548 possible nutritional interventions could be identified in 50 patients as a result of the MNA assessment, and 434 as a result of the NuRAS. The difference is mainly explained by the section of the MNA dealing with specific food items and fluid intake. In the NuRAS the questions about the social situation and chronic pain are helpful in identifying possible nutritional interventions. A formal nutritional assessment is an educational tool for physicians (and other health workers) in training, while the somewhat complicated anthropometric measurements may well please the patient. Sometimes, however, anthropometry is impossible or unreliable (for example, when there is edema) or may produce unnecessary difficulties (as with an amputation).

Every procedure must be as simple as possible, especially when performed in young elderly and generally healthy populations, where only a few positive results can be expected. A screening procedure or an abbreviated MNA [Rubenstein LZ, this volume] should suffice; in the typical geriatric patient, where a formal comprehensive geriatric assessment is indicated, a nutritional assessment such as the MNA or the NuRAS should be incorporated. The questions and their interpretation must be as clear as possible, for example they should be outlined in an instruction manual (see question “living alone” in the MNA, because living alone can be either a good sign or a risk factor). Finally, the interventions resulting from the assessment should be effective and should ideally be followed by improved scores in the nutrition assessment, as could be shown by Battandier et al. [this volume] with the MNA, leading to a better quality of life for the geriatric patient.
References


Discussion

Dr. Ferry: A question for Dr. Oster about the item “living alone” in the MNA: does this mean “being isolated” or “being able to live alone,” that is, not in a nursing home. There is a big difference between the two.

Dr. Oster: You get a point in the MNA for living alone. This might be good, but it might be very bad if you are isolated and depressive.

Dr. Cohendy: I do not agree that the first block of the MNA questionnaire is difficult to calculate. We have calculated more than 400 questionnaires, and found no special difficulty. Perhaps this is because our aims were somewhat different. For us, the aim was to assess risk; for Dr. Oster it was to describe the mechanism leading to malnutrition in elderly patients. In my view, it would be desirable if at the end of this conference we could say whether the MNA is a tool for assessing risk of malnutrition or for assessing the mechanism leading to malnutrition.

Dr. Oster: I was quoting the opinions of my coworkers, who really performed the assessment. Knowing that subjective assessment is also quite reliable, they suggested that it might be sufficient just to have the subjective rating of a physician or a nutritionist. Rather than stopping doing the MNA because it is too complicated, it would be preferable to get a subjective idea of whether malnutrition is present or not.

Dr. Vellas: I’d like to remind you that the MNA was designed to be used in the clinic. If patients go to see a physician because of anorexia or weight loss, the clinician needs to examine them as well as taking a history. Anthropometric measurements are really useful clinical markers in this regard. It would be hard for the physician to ask for $50 if they don’t touch the patient! Also, when anyone learns to use the MNA, with all its questions, they are learning how to do a nutritional assessment. The MNA was designed for clinic-based nutritional assessment, not as a fast screening tool for public health.

Dr. Arnaud-Battandier: We observed in France that some general practitioners in private practice consider the anthropometry difficult to do and time-consuming. So we proposed that they not do this block in certain circumstances. When using MNA for diagnostic purposes, even if you have the maximum value for anthropometry, the score will still be below 17 if the other indicators are negative. Of course, to follow the patient with MNA, you need anthropometric measurements.

Dr. Shimmler: I think this touches on the issue of the use of MNA: is it to assess status or to measure risk? What you are saying is that if you want to get a measure of nutritional status at a particular point in time, and if the score is going to be below 17 whatever the body measurements, then you’ve answered the question already: their nutritional status is low.
Comparative Nutrition Evaluation with MNA and NuRAS

But if you want to predict the future outcome and risk, then you will need the additional part to complete the assessment.

*Dr. Salvad:* If you want to do a nutritional assessment, you need to measure body mass index or some other anthropometric index. It is very important to know if there has been weight loss, and how much change there has been. When we do the MNA, it is not enough to look at the total MNA score; we need to look at each of the questions, because if there is a diagnosis of malnutrition, we need to plan an intervention program. Only by obtaining anthropometric measures can we follow the patient’s progress.

*Dr. Morley:* Your point is very well taken. Dr. Miller and I have done two studies, one at UCLA and one in St. Louis, looking at the ability of residents to recognize malnutrition [1]. If you ask someone “Does this person look malnourished?”, they can often give you the right answer, but they are incapable of seeing it unless you ask the question. That is where I think anthropometry becomes very important; it trains people to understand and to look for malnutrition. I would strongly encourage maintaining the anthropometric score component.

*Dr. Chumlea:* I have a comment about MNA as an instrument for multicultural use. There may be problems with asking questions in the right way. For example, Japanese or Chinese people may have a different perception from Westerners about what constitutes fruits and vegetables. That needs to be looked into if you’re planning to use the MNA in other cultures.

**Reference**


40