Prevalence and screening of hospital malnutrition at the Azienda Ospedaliero Universitaria Careggi (Florence, Italy)

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1. INTRODUCTION
Malnutrition is a common cause and consequence of illness, especially in older people (1,2). Malnutrition affects the function of every organ system, increases the risk of infection, extends hospital stay and increases costs. In European and US hospitals, an average of 30% of patients are malnourished. Despite the frequency of malnutrition, it is undiagnosed in most patients. Many scientific bodies recommend that screening tools be implemented and regularly employed in hospitals but this suggestion is rarely followed. The Council of Europe has identified 5 factors contributing to hospital malnutrition in Europe: 1) dilution of responsibility as nutritional assistance is concerned; 2) lack of adequate training of health care providers; 3) lack of knowledge of patient’s preferences and objectives; 4) lack of cooperation among different health care operator and, 5) lack of interest about nutrition from health care administrators (3). In line with the available evidence, nutritional support is a neglected problem at the Azienda Ospedaliero-Universitaria Careggi (AOUC, Florence, Italy). Our clinical charts do report the diagnosis of undernutrition only in a very small number of cases. Even more important, our charts do not report simple data from clinical history and physical examination which are essential to diagnose undernutrition. These data are weight, height, involuntary weight loss, difficulty at eating, and quantity of food consumed during the hospital stay. This is a problem because, as pointed out by the World Health Organization, “Anthropometry is the single, most universally applicable, inexpensive, and non-invasive method to assess the size, proportions and composition of the human body. Moreover, since body dimensions at all ages reflect the overall health and welfare of individuals and populations, anthropometry may be used to predict performance, health and survival” (4).

2. METHODOLOGY
The aim of this study was twofold: 1) to assess the prevalence and incidence of malnutrition at the Azienda Ospedaliero-Universitaria Careggi and, 2) to evaluate the accuracy of nutritional screening performed by nurses as compared to dietitians. In a pilot study aimed at identifying the most suitable screening test for AOUC, we compared the nurse vs. dietician accuracy of MUST and NRS-2002 in a sample of 18 consecutive patients (5,6). As a result of this study, we choose MUST as the screening tool because simpler to compile and less prone to errors. A sample size of 720 patients was chosen for the study hypothesizing a frequency of malnutrition of 0.30 to be assessed with a 95% confidence interval from 0.27 to 0.33. Patients were enrolled at 5 medical and surgical wards of AOUC. They were randomly selected in number of about 16/month per ward using a computer-generated list. Within 24 hours from admission of the patients, the nurses measured weight, height, arm circumference (left), calculated BMI, and compiled MUST. Within 48 hours from admission, the dietitians performed the same measurements made by the nurses plus those of triceps and subscapular skinfold and recomputed weight if standard weight could not be measured. The same procedure was repeated at patients’ discharge.

3. RESULTS
662 (92%) of 720 planned patients were enrolled into the study and 132 nurses and 11 dietitians took part to the study. However, only 499 MUST were compiled in their entirety by both nurses and dietitians at admission and 259 at discharge. Moreover, only 222 MUST were compiled in their entirety by dietitians and nurses at both admission and discharge. The prevalence and incidence of malnutrition calculated from the available MUST are given in Table 1. Taking dieticians as the gold standard, the true positive rate and the true negative rate of nurses in detecting a MUST ≥ 2 were 0.70 and 0.95 respectively. This corresponds to a positive likelihood ratio of 1.43 and to a negative likelihood ratio of 0.3.

4. CONCLUSIONS
The prevalence of malnutrition (MUST ≥ 1) as admission in the AOUC was around 30%, in line with available estimates. Importantly, nearly half of the patients were severely malnourished (MUST ≥ 2). On the basis of the admission data, AOUC nurses can screen malnutrition using MUST with virtually no false negatives (5%) but with some false positives (30%). The prevalence of malnutrition at discharge was very high, in line with available evidence. Nonetheless, these data must be taken with caution because they were obtained only in a subsample of patients.

After this study, we created an ad hoc group in order to assess the best strategy to control hospital malnutrition inside AOUC. The Italian Association of Dieters (ANDID) collaborated with the Centre for Clinical Risk Management and Patient Safety of the Tuscany Region to the development of a protocol of “Good Clinical Practice” protocol aimed at treating and preventing undernutrition. Such protocol was enacted by the Government of the Tuscany Region on February 25, 2008.

5. REFERENCES

<table>
<thead>
<tr>
<th>Prevalence/admission (n=499)</th>
<th>Prevalence/discharge (n=259)</th>
<th>Incidence (n=222)</th>
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<tbody>
<tr>
<td>N</td>
<td>D</td>
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<tr>
<td>MUST ≥1 (“severe”)</td>
<td>28%</td>
<td>32%</td>
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<tr>
<td>MUST 2 (“moderate”)</td>
<td>16%</td>
<td>18%</td>
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Table 1: Prevalence and incidence of malnutrition