Malnutrition – The Ignored Risk Factor

Herbert Lochs  Christos Dervenis

Nutritional therapy, once a cornerstone of medical treatment, has lost its attractiveness in favor of drug treatment, molecular genetic interventions or other high-tech therapies. As a consequence, data about nutritional status or dietary habits are missing in many patient charts. This development reflects the opinion of many doctors that nutrition does not greatly affect the course of diseases, and that nutritional intervention is laborious but much less effective than other forms of therapy. In view of this trend, it seems interesting to analyze the importance of nutrition in different diseases.

Of course, it is well accepted that nutrition is an important factor for the therapy and prognosis in several diseases, such as diabetes mellitus, hyperlipidemia, obesity or hemochromatosis. However, the most basic nutritional disturbance – malnutrition – is frequently ignored since it is considered as a complication of the disease process, with little bearing on the prognosis and little possibility for therapeutic intervention. However, an analysis of the literature reveals that malnutrition is an independent risk factor in many disease processes and that treatment of malnutrition can indeed improve the patients’ prognosis.

Such an analysis has to address several questions, mainly the prevalence and diagnosis of malnutrition and its impact on the patients’ prognosis. It should set the stage for the papers in this issue of Digestive Diseases, which deals with nutritional questions.

Prevalence and Diagnosis of Malnutrition in Hospitalized Patients

An evaluation of the nutritional status of hospitalized patients in different countries shows a prevalence of malnutrition between 20 and 60% of admitted patients (table 1). The prevalence is not different among different countries; however, a subgroup analysis showed that geriatric patients as well as patients with malignant diseases carry the highest risk of becoming malnourished.

The parameters used to diagnose malnutrition varied considerably in the different studies. In older studies, usually static parameters of the nutritional status, like body mass index or anthropometric measurements, were used. However, later on, it became clear that body composition reflecting the percentage of lean body mass, water and fat, or indices including dynamic parameters, like weight loss or a stress factor, do correlate better with the patients’ prognosis than plain body weight or body mass index. From these studies, several nutritional indices have been developed which allow conclusions about the prognosis and might therefore be used to define patients with an indication for nutritional therapy.

The subjective Global Assessment (SGA) is one of the most widely used nutritional indices [1]. It consists of a patient history part (recent weight loss, changes in eating habits, gastrointestinal symptoms, physical fitness and stress factor) and a physical examination (body weight, subcutaneous fat mass, muscle atrophy, edema). The subjective global assessment is easy to calculate and therefore convenient to use in a clinical setting. A similar index (NRS 2002) has recently been developed by the European Society of Parenteral and Enteral Nutrition [2]. It also includes a patient history (weight loss, reduced dietary intake) physical parameters (body mass index) and a disease severity factor. Like the SGA, it can be calculated quickly and is therefore useful in the clinical situation. It is important to mention that malnutrition does not necessarily correlate with a low body mass. Changes in body composition with an increased fat mass and decreased body cell mass pose a similar risk to the patient than overt malnutrition with reduced body mass, as has been shown in a recent investigation [3].

Impact of Malnutrition on Prognosis

Malnutrition has a profound impact on a patient’s prognosis. Malnourished patients have a higher risk of postoperative complications when compared to well-nourished patients and a longer hospital stay [3–7]. Furthermore the long-term mortality of malnourished patients is much higher than that of comparable well-nourished patients [8]. This is particularly important since physicians in the hospital usually see the patient only for 7–10 days during his/her hospital stay. As has been shown in several studies, posthospital mortality is significantly increased in malnourished patients. The fact that this complication of malnutrition is developing so late explains why hospital physicians are not more aware of malnutrition-associated risks.

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However, there are also economic impacts of malnutrition during the hospital stay. Reilly et al. [9] calculated the patient costs of 771 hospitalized patients for USD 11,217 versus USD 7,660 for well-nourished patients. Robinson et al. [10] prospectively calculated the expenses for 100 patients. Well-nourished patients had a median stay of 10 days whereas malnourished patients stayed for 16.6 days. The actual cost was USD 7,692 for the well-nourished and USD 16,691 for the malnourished patients. On a DRG basis, payment from well-nourished patients was USD 4,352 and USD 5,124 for malnourished patients. This clearly shows that malnutrition is not just a risk for the patient but also a financial risk for the hospital. A study by Bruaenschweig et al. [11] who followed the expenses for 404 patients who were hospitalized for more than 7 days is especially interesting. Patients were divided into a reference group which had not lost weight during their hospital stay and a group who lost weight independently of their initial nutritional status. The control group generated an average expenditure of USD 28,631 whereas the group who lost weight generated an average expenditure of USD 45,762.

This issue of Digestive Diseases is devoted to nutritional problems. A number of papers deal with problems of malnutrition in different diseases. Besides the prevalence of malnutrition in hospitalized patients, questions concerning the impact of malnutrition in gastrointestinal cancer and acute pancreatitis as well as inflammatory bowel disease are discussed. Furthermore, nutritional therapy has proved to be effective not just as treatment of preexisting malnutrition but also to influence disease processes, as has been shown in inflammatory bowel disease, hepatic encephalopathy and other gastrointestinal diseases. By raising their attention to nutritional problems, doctors will hopefully increasingly again include nutritional therapy in patient care.

### Table 1. Prevalence of malnutrition in hospitalized patients

<table>
<thead>
<tr>
<th>Authors</th>
<th>n</th>
<th>Country</th>
<th>Disease</th>
<th>Malnourished, %</th>
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<td>Bistrian et al. (1976)</td>
<td>131</td>
<td>USA</td>
<td>surgery</td>
<td>50</td>
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<td>general medicine</td>
<td>44</td>
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<td>surgery</td>
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<tr>
<td>Weinsier et al. (1979)</td>
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<td>48</td>
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<tr>
<td>Coats et al. (1993)</td>
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<td>USA</td>
<td>general medicine</td>
<td>38</td>
</tr>
<tr>
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<td>multidisciplinary</td>
<td>40</td>
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<td>Cederholm et al. (1995)</td>
<td>205</td>
<td>S</td>
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<td>Pirlich et al. (2003)</td>
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<td>multidisciplinary</td>
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### References