Oral Feeding in the Nutritional Management of the Cancer Patient

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Summary

Nutritional therapy of the cancer patient by the oral route includes management of factors that may cause anorexia, attempts to modify the patient’s eating behavior, and the offering of nutritional supplements to the patient. Anorectic patients for which specific strategies may be employed include taste abnormalities, pain, nausea, and depression. Modification of the patient’s eating behavior involves patient education, monitoring, and feedback. Education includes nutritional instruction and instruction in favorable patterns for mealtime eating and stimulation of snack eating. Snack eating includes the use of nutritional supplements, and patient acceptance of commercially available supplements was studied. When synthetic chemically defined nutritional products were compared with a milk-based product, patients preferred the milk-based product. Intercomparisons between milk-based products showed slight differences in preference ranking among these products and also differences between patients and controls in their relative order of ranking. Preference testing may be useful in assisting the health care team in selecting the optimal nutritional supplement to offer each patient.

Anorexia occurs in many cancer patients, and in most patients the mechanism is incompletely understood (3). The clinician has several approaches to offer the anorectic patient, including strategies for modifying the patient’s pattern of food intake and the use of oral nutritional supplements, tube feeding, or parenteral nutrition. Treatment of anorexia and improvement in the patient’s metabolic condition may contribute to the patient’s sense of well being, improve his chances of response to therapy, and diminish the toxicity from such therapy. In this presentation we will review a strategy for modifying the patient’s food intake behavior and will present a preference evaluation of commercially available oral nutritional supplements.

Strategy for Modifying Food Intake

We have formulated a strategy for modifying food intake based both on an understanding of factors that may contribute to the patient’s anorexia and on the principles of behavior modification, which have been partially successful in modifying feeding behavior in the obese patient. As long as anorexia is incompletely understood, this strategy will of necessity be incomplete, but it may provide a worthwhile overall approach by incorporating our present level of understanding of anorexia. This strategy can be divided into 2 parts, approaches to specific problems and nonspecific approaches to the modification of eating behavior. Specific problems that may be dealt with include taste abnormalities, pain, nausea, depression, and conditioned responses. Patients who complain that food has lost its taste have been found to have an elevated taste threshold for sweet, and they may be benefited by the use of increased seasoning and flavoring of their food (1–4). Patients having difficulty with the taste of meat may often have a lower threshold for bitter, and these patients may benefit from changes in the meat composition of their diet. Patients with this symptom have the greatest difficulty with beef and pork but may still be able to eat poultry and fish. If this symptom is more severe, they may also have difficulty with poultry and fish but may still be able to eat eggs and cheese as a protein source.

Pain may significantly interfere with eating behavior, and the judicious use of analgesics, especially if given a short time before the meal, may improve eating behavior. Patients with cancer may have nausea either as an effect of their treatment or as a systemic effect of their malignancy, and liberal use of antiemetics may improve eating behavior in these patients. Cancer patients may develop depressive reactions, especially at the time of diagnosis or when the disease is progressing, and such depression may interfere with food intake. Emotional supportive care may be of value, but we usually do not recommend psychopharmacological agents. Conditioned responses may develop, for example, in a patient who has bowel obstruction and develops abdominal pain repeatedly after eating. These patients, even after surgical correction of their problem, may experience difficulty eating, and this may respond to behavior therapy approaches.

The nonspecific approach to modification of eating behavior is based on behavior modification principles. This involves educating the patient; establishing a limited, potentially achievable goal; and measuring and providing feedback. The goal usually suggested is maintenance of current weight. Regaining lost weight is often an unachievable goal. The body weight is measured at regular visits, and patients are given feedback on the basis of this result. Additional details are the maintenance of a diary of food intake, discussion with the patient of techniques of meal-
time eating, and encouragement of specific behaviors to stimulate mealtime and snack eating. The techniques of mealtime eating that may be advantageous include serving food family style, attempting to serve foods of high caloric density, and allowing the patient a leisurely pace of eating. Specific maneuvers to stimulate mealtime and snack eating include providing an adequate supply of snack foods in the home, storing leftover foods in attractive containers, allowing the patient to suggest freely items for the food shopping list, and associating meals with pleasant surroundings and activities. One type of snack of high nutritive value is the commercially available nutritional supplement. In an effort to achieve better patient acceptance of these products, we have evaluated patient preferences of several supplements.

Evaluation of Nutritional Supplements in Cancer Patients

Commercially available nutritional supplements were evaluated in panels of 5 supplements presented to each patient using a double-blind randomized sequence based on a latin square (8, 9). Patients were presented 5-cc aliquots of each supplement and were asked to rate the taste of the supplements on a 7-point scale ranging from −3 to +3 (see Chart 1 and Table 1). Patients rinsed their mouths with distilled water between samples. Two panels of supplements were tested in cancer patients, and the 2nd panel was also tested in normal controls. The 1st panel included 4 supplements that are synthetic in formulation, which were tested as orange-flavored products, and a 5th supplement that was a milk-based vanilla-flavored product (Chart 1; Table 1). Since the vanilla-flavored, milk-based product was favored most highly, a 2nd panel with 4 vanilla-flavored, milk-based products and 1 semisynthetic vanilla-flavored product was tested (see Chart 2 and Table 2). Two products were common to both panels, namely the Meritene, which was presented in each panel with a vanilla flavor, and Vivonex standard, which was presented in the 1st panel as an orange flavor and in the 2nd panel as a vanilla flavor.

The study sample consisted of 2 groups of 25 patients with metastatic neoplasia who were studied as outpatients or inpatients of the Northwestern University Medical Oncology Service. The study patients ranged in age from 25 to 81 years (median, 57 years). Selection of patients was based on patient willingness to participate in this study, and an effort was made to obtain a broad distribution of patients as to extent of disease and extent of weight loss. A series of 25

### Table 1

<table>
<thead>
<tr>
<th>Food supplement</th>
<th>Mean preference score</th>
<th>Significance testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meritene</td>
<td>+0.88</td>
<td>p &lt; 0.03</td>
</tr>
<tr>
<td>Precision LR</td>
<td>−0.28</td>
<td>NS</td>
</tr>
<tr>
<td>Vivonex HN</td>
<td>−0.30</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Vivonex standard</td>
<td>−1.72</td>
<td>NS</td>
</tr>
<tr>
<td>WT low residue</td>
<td>−1.96</td>
<td>NS</td>
</tr>
</tbody>
</table>

* Meritene was studied in a vanilla flavor and the others orange flavor.

Food supplement preference scale: −3, very bad taste; −2, moderately bad taste; −1, mildly bad taste; 0, indifferent taste; +1, mildly good taste; +2, moderately good taste; +3, very good taste.

c Significance testing using the Mann-Whitney U test.

### Table 2

<table>
<thead>
<tr>
<th>Nutritional supplement</th>
<th>Mean preference score</th>
<th>Significance testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure</td>
<td>+0.52</td>
<td>NS</td>
</tr>
<tr>
<td>Nutri-1000</td>
<td>+0.36</td>
<td>NS</td>
</tr>
<tr>
<td>Sustacal</td>
<td>+0.28</td>
<td>p = 0.02</td>
</tr>
<tr>
<td>Meritene</td>
<td>−0.84</td>
<td>NS</td>
</tr>
<tr>
<td>Vivonex standard</td>
<td>−1.96</td>
<td>NS</td>
</tr>
</tbody>
</table>

* All supplements were vanilla flavored.

b Food supplement preference scale: −3, very bad taste; −2, moderately bad taste; −1, mildly bad taste; 0, indifferent taste; +1, mildly good taste; +2, moderately good taste; +3, very good taste.

c Significance testing using the Mann-Whitney U test.
Correlation of urea recognition threshold and rating of nutritional supplements shown in Table 2

<table>
<thead>
<tr>
<th>Urea recognition threshold (mmoles/liter)</th>
<th>Negative</th>
<th>Zero or positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 60</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>60 or more</td>
<td>7</td>
<td>11</td>
</tr>
</tbody>
</table>

* No. of patients with a mean preference score in the categories shown.

Comparison of nutritional supplement scoring in cancer patients and controls

<table>
<thead>
<tr>
<th>Nutritional supplement</th>
<th>Av. preference scores*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients</td>
</tr>
<tr>
<td>Ensure</td>
<td>+0.52</td>
</tr>
<tr>
<td>Nutri-1000</td>
<td>+0.36</td>
</tr>
<tr>
<td>Sustacal</td>
<td>+0.28</td>
</tr>
<tr>
<td>Meritene</td>
<td>-0.84</td>
</tr>
<tr>
<td>Vivonex standard</td>
<td>-1.16</td>
</tr>
</tbody>
</table>

* Food supplement preference scale: -3, very bad taste; -2, moderately bad taste; -1, mildly bad taste; 0, indifferent taste; +1, mildly good taste; +2, moderately good taste; +3, very good taste.

Comparison between patients and controls using the Mann-Whitney U test indicated a significant difference (\( x^2 = 85.36 \), 4 degrees of freedom, \( p < 0.001 \)). Thus, the overall evaluation of nutritional supplements by patients is significantly different from the overall evaluation of the same supplements by a normal control population. In addition to this overall statistical evaluation, comparison by specific nutritional supplements shows 2 differences that approached statistical significance (Ensure and Sustacal) and the Vivonex comparison, which is statistically significant (see Table 4).

Comment

As the mechanisms of anorexia in cancer patients become better understood, the approach outlined herein should be modified to incorporate newer information. We see the need for better understanding of food choices and use of food supplements to assist the cancer patient in maintaining adequate caloric intake.

There was no correlation between patient preference scores and sucrose recognition thresholds. A comparison of the nutritional supplement preference scores of the cancer patients and the controls is presented in Table 4. There is a difference in sequence of preference for the supplements between patients and controls. Patients preferred Ensure and ranked Sustacal 3rd, whereas controls reversed the position of these 2 supplements. Controls and cancer patients were similar in ranking Meritene and Vivonex lowest of these 5 supplements. The controls scored Vivonex more strongly negative than did the cancer patients. Overall the range of average scores is broader for the controls (+0.96 to -1.88) than for the patients (+0.52 to -1.16). Thus one may consider that patients have a construction of their preference scores. Analysis of the data in Table 4 using a \( x^2 \) test indicated a significant difference (\( x^2 = 85.36 \), 4 degrees of freedom, \( p < 0.001 \)). Thus, the overall evaluation of nutritional supplements by patients is significantly different from the overall evaluation of the same supplements by a normal control population. In addition to this overall statistical evaluation, comparison by specific nutritional supplements shows 2 differences that approached statistical significance (Ensure and Sustacal) and the Vivonex comparison, which is statistically significant (see Table 4).

References

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