Nutrition in Cancer Patients: It Does Make a Difference

Presented by
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Alicia Gilmore has nothing to disclose.
Suzanne Dixon has nothing to disclose.

Learning Objectives

• Explain the difference between cancer-related anorexia and cachexia
• Describe the evidence for specific medical and nutritional interventions for patients suffering from anorexia or cachexia
• Identify the proper nutritional assessment tools for identifying nutrition-specific indicators of malnutrition risk, and the optimal, multi-disciplinary, collaborative approaches for managing these issues

Anorexia Defined

• Anorexia ≠ Cachexia
• Terms are not interchangeable

Definition of Anorexia

“a lack or loss of appetite for food (as a medical condition)”
“loss of appetite and inability to eat”

Causes of Anorexia in Individuals with Cancer

• Nausea and vomiting
• Early satiety
• Taste alterations/sensitivity to food smells
• Dry mouth
• Constipation
• Diarrhea
• Mucositis/stomatitis
• Anxiety
• Depression
• Stress (many sources)
• Fatigue
• Medications

Symptom Burden a Predictor of Nutrition Risk

n = 191, medical oncology population of mixed tumor types

Physiology of Anorexia

- Metabolic function remains intact
- Caused only by inability to eat
- Physiologic changes do not prevent nutritional repletion
- Additional protein and calories will improve nutritional status

Managing Anorexia: Challenges

- How to creatively manage symptoms and side effects to allow for increased intake
- Must rely on patience, persistence, and repetition
- Need to be an advocate
- Must educate the family

Without the presence of obvious weight loss, the majority of cancer patients typically have similar protein and calorie needs as healthy individuals.

A. Yes
B. No

Individuals with Cancer May Need More

<table>
<thead>
<tr>
<th>Healthy Individuals</th>
<th>Cancer Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories: 25 to 30 kcal/kg</td>
<td>25 to 35 kcal/kg*</td>
</tr>
<tr>
<td>Protein: 0.8 to 1.0 g/kg</td>
<td>1.5 to 2.5 g/kg</td>
</tr>
</tbody>
</table>

*For maintenance; for gain/repletion, up to 40 kcal/kg!

What does 40 kcal/kg look like?

- 100 lbs: 1,800-1,900 kcal/day
- 130 lbs: 2,300-2,400 kcal/day
- 150 lbs: 2,700-2,800 kcal/day
- 180 lbs: 3,200-3,300 kcal/day

Cachexia Defined

- Cachexia ≠ Anorexia

Definition of Cachexia

“A multi-factorial syndrome defined by an ongoing loss of skeletal muscle mass (with or without loss of fat mass) that cannot be reversed by conventional nutritional support and leads to progressive functional impairment.”

Physiology of Cachexia

- Deranged metabolic state, with abnormal hormonal milieu
- Typically occurs in conjunction with anorexia, but not always
- Pathophysiology hinders nutritional repletion
- Protein and calories alone will not improve nutritional status
Insulin resistance
Hyperglucagonemia
Hyperglycemia
Hyperlipidemia
Failure to utilize glucose and free fatty acids for energy
\( \uparrow \) metabolism due to white to brown fat conversion
Lean body mass becomes primary energy source

Induced by combination of calorie deficit and underlying factors

LBM accounted for 71% of loss

Unintentional vs. Intentional Weight Loss

Intentional:
- Induced by intentional calorie deficit, results in adaptive response, and a switch from LBM and fat for energy to predominantly fat

Unintentional:
- Induced by combination of calorie deficit and underlying inflammatory response, and the switch from LBM and fat for energy to predominantly fat does not occur

Screening:
- The process of identifying those who are at risk for malnutrition.
- Why is this important?
  - 40% patients experience anorexia and weight loss prior to diagnosis
  - 40-80% patients are expected to experience malnutrition at some point in treatment

Hallmarks of Cachexia

- Insulin resistance
- Hyperglucagonemia
- Hyperglycemia
- Hyperlipidemia
- Failure to utilize glucose and free fatty acids for energy
- \( \uparrow \) metabolism due to white to brown fat conversion
- Lean body mass becomes primary energy source

Lean Body Mass Depletion: Predictor of Survival

- 2 prognostic models of survival in lung & GI patients (n=1,473)
  - Conventional covariates: tumor type, stage, age, performance
  - Nutrition covariates: BMI, weight loss, muscle index/attenuation

Unintentional Weight Loss

- Well-designed study of 17 head and neck patients in active, concurrent therapy protocol
- DEXA, Indirect Calorimetry, Physical Performance Assessment, Fasting Blood Measures, Serial 24-Hour Dietary Recalls

Over 9 Week Follow Up Through Treatment:
- Weight loss began immediately
- Average total loss of 6.8 kg (15 lbs) \( \sim \) 1.7 lbs per week
- LBM accounted for 71% of loss

Reality of Unintentional Weight Loss

- Induced by combination of calorie deficit and underlying inflammatory response, and the switch from LBM and fat for energy to predominantly fat

Unintentional vs. Intentional Weight Loss

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Screens

• Valid
• Specific
• Quick and easy to use
• Who is administering the tool?
• How much time will it take?
• How are referrals handled?

Tools

• Patient Generated Subjective Global Assessment (PG-SGA)
• Malnutrition Screening Tool (MST)
• Malnutrition Screening Tool for Cancer Patients (MSTC)
• Malnutrition Universal Screening Tool (MUST)

<table>
<thead>
<tr>
<th>Screening Tool</th>
<th>Items evaluated</th>
<th>Population validated</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG-SGA</td>
<td>7</td>
<td>Inpatient and Outpatient</td>
<td>Conducted by patient and RN; includes diagnosis and physical exam.</td>
</tr>
<tr>
<td>MST</td>
<td>2</td>
<td>Inpatient and Outpatient</td>
<td>Asks regarding weight loss, how much weight was lost, and if patient is eating less. Screening only.</td>
</tr>
<tr>
<td>MSTC</td>
<td>4</td>
<td>Inpatient only</td>
<td>Uses change in intake, weight loss, body mass index, and Eastern Cooperative Oncology Group (ECOG) performance measure.</td>
</tr>
<tr>
<td>MUST</td>
<td>4</td>
<td>Inpatient only</td>
<td>Uses BMI, unintentional weight loss, and acute disease effect as well as potential for no oral intake. Presence of obesity is noted.</td>
</tr>
</tbody>
</table>

Interventions: Dietary

On-going coaching, encouragement, being an advocate

• Taste
• Presentation
• Atmosphere
• Meal preparation
• Meal frequency and snacks
• Family dynamics

Interventions: Non-dietary

Potential benefits for symptoms contributing to anorexia:

• First address contributory factors: anxiety, depression, family and spiritual distress, malabsorption, pain, oral complications, constipation, insomnia, correctable hormonal factors (thyroid, hypogonadism, adrenal insufficiency, etc), lack of support/help
• Progestational agents and corticosteroids
• Cannabinoids – medical cannabis appears more effective than pharmaceuticals; consult knowledgeable resource
• Promotility agents and Proton pump inhibitors
• Non-steroidal anti-inflammatory agents
• Nutrients – omega-3s, amino acids, zinc, vitamins (IV and oral)
• Exercise – almost always underutilized
Early Nutrition Intervention = Improved Outcomes

Quality of life (QOL)
- Performance status
- Response and tolerance to treatment

Morbidity: Symptoms & Side Effects
- Complications

Early, Dedicated Nutrition Intervention Works
- RCT of 111 CRC patients seen in outpatient radiation oncology clinic
- Randomized to Dedicated Nutrition Intervention (NI) or Usual Care (UC)
- Followed Average of 7 Years

Maintain Adequate Nut Status: 91% for NI vs. 0% for UC (p < 0.002)
Late Radiotherapy Toxicity: 9% for NI vs. 65% for UC (p<0.001)
Median Survival: 7.3 years for NI vs. 4.9 years for UC (p<0.01)

Nutrition Matters in All Phases

Pre-cachexia ➔ Cachexia ➔ Refractory Cachexia
- Loss of just 5% of baseline weight can shorten survival
- Intervening early allows repletion when metabolic changes are not working against you
- Allowing patients to lose nutritional reserves early leads to death from malnutrition before death from disease process
- Consider Days/Weeks/Months For Nutritional Approach

Why Screening & Early Intervention Key

At Diagnosis
Weight Loss/Malnutrition Present
- Treatment and Disease Progression
- Exacerbate Malnutrition
- Further Progression Can Lead to Cachexia
- Important opportunity to halt loss and foster gains