Unlocking the role of nutrition in cancer treatment: is nutritional status associated with treatment tolerance?

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Introduction

Optimal nutrition is integral for maintaining health + recovering from illness

Existing gap of how inadequate nutritional maintenance may affect tolerance of cancer treatment

Clinical Questions

Do patients with poor nutritional status have worse treatment tolerance?

Can we identify risk factors for poor nutrition to better direct dietitian interventions?

3. Symptoms: I have had the following problems that have kept me from eating enough during the past two weeks (check all that apply)

- ☐ no problems eating (0)
- ☐ no appetite, just did not feel like eating (3)
- ☐ nausea (1)
- ☐ constipation (1)
- ☐ mouth sores (2)
- ☐ things taste funny or have no taste (1)
- ☐ problems swallowing (2)
- ☐ pain; where? (3) _____
- ☐ other (1)** _____
- ☐ vomiting (3)
- ☐ diarrhea (3)
- ☐ dry mouth (1)
- ☐ smells bother me (1)
- ☐ feel full quickly (1)
- ☐ fatigue (1)

Examples: depression, money, or dental problems **Box 3 ☐

Weight loss in 1 month	Points	Weight loss in 6 months
10% or greater	4	20% or greater
5-9.9%	3	10- 19.9%
3-4.9%	2	6- 9.9%
2-2.9%	1	2- 5.9%
0-1.9%	0	0- 1.9%

Figure 1. Box 3 and Worksheet 1 of the PG-SGA

Methods

Design: retrospective chart review

Inclusion criteria: patients at the Hillman Cancer Center (HCC) in Pittsburgh, PA + cancer diagnosis in the last 18 years

Exclusion criteria: personal exposure to chemo/radiation prior to HCC intake

Analysis: linear and logistic regression, significance was set a priori at 0.05

Nutritional status followed through treatment and scored using Box 3 + Worksheet 1 of the standardized Patient-Generated Subjective Global Assessment (PG-SGA) (Fig. 1)

Results

Patients with PG-SGA Score >3:

- Terminate therapy early (OR: 7.09, p <0.001)
- Change therapy secondary to intolerance (OR: 1.96, p =0.002 for cytopenia; OR: 2.15, p <0.001 for fatigue; OR: 6.19, p <0.001 for dehydration)
- Are no more likely to see outpatient dieticians (p =0.51)

Results, cont

n (%) or mean (SD)	PG-SGA 1-3 n=328 (64.2%)	PG-SGA 4-8 n=183 (35.8%)	Total n=511 (100%)	p-value
Sex				0.29
Female	149 (45.4)	92 (50.3)	241 (47.2)	
Male	179 (54.6)	91 (49.7)	270 (52.8)	
Age	60.8 (13.8)	62.3 (12.5)	61.2 (13.4)	0.14
ECOG				0.003
0	186 (57.9)	76 (41.8)	262 (52.1)	
1	124 (38.6)	97 (53.3)	221 (43.9)	
2	9 (2.8)	9 (5.0)	18 (3.6)	
3	2 (0.6)	0 (0.0)	2 (0.4)	
Cancer Stage				0.04
I	41 (13.4)	19 (10.6)	60 (12.4)	
II	70 (23.0)	27 (15.1)	97 (20.0)	
III	83 (27.2)	46 (25.7)	129 (26.7)	
IV	111 (36.4)	87 (48.6)	198 (40.9)	
Therapy Type				
Immunotherapy	185 (56.4)	110 (60.1)	295 (57.7)	0.42
Radiation	133 (40.6)	89 (48.6)	222 (43.4)	0.08
Chemotherapy	253 (77.1)	169 (92.4)	422 (82.6)	<0.001
Surgery	196 (59.8)	103 (56.3)	299 (58.5)	0.45
Monoclonal antibody	2 (0.6)	0 (0.0)	2 (0.4)	0.29
Palliative	25 (7.6)	30 (16.4)	55 (10.8)	0.002
Hormone therapy	44 (13.4)	17 (9.3)	61 (11.9)	0.17
Clinical trial	77 (23.5)	40 (21.9)	117 (22.9)	0.67
Early Therapy Termination	26 (8.0)	68 (38.2)	94 (18.7)	<0.001
Therapy Changes Secondary to Intolerance	178 (54.6)	134 (74.0)	312 (61.5)	<0.001
Cytopenia	59 (18.0)	55 (30.1)	114 (22.3)	0.002
GI Distress	43 (13.1)	45 (24.6)	88 (17.5)	0.001
Fatigue	62 (18.9)	61 (33.3)	123 (24.1)	<0.001
Dehydration	4 (1.2)	13 (7.1)	17 (3.3)	<0.001
Nutritionist Consult Request	155 (47.4)	86 (47.5)	241 (47.4)	0.98
BMI				0.67
Underweight (<18.5)	8 (2.5)	6 (3.3)	14 (2.8)	
Normal weight (18.5-24.9)	111 (33.9)	63 (34.4)	174 (34.1)	
Overweight (25-29.9)	105 (32.1)	59 (32.2)	164 (32.2)	
Class I Obesity (20-24.9)	68 (20.8)	29 (15.9)	97 (19.0)	
Class II Obesity (35-39.9)	22 (6.7)	15 (8.2)	37 (7.3)	
Class III Obesity (>40)	13 (4.0)	11 (6.0)	24 (4.7)	
Nutritionist Visit				
Yes, either	161 (49.2)	159 (86.9)	320 (62.8)	<0.001
Inpatient	126 (78.3)	155 (97.5)	281 (87.8)	<0.001
Outpatient	70 (43.5)	74 (46.5)	144 (45.0)	0.51

Table 1. Association between PG-SGA score and clinical characteristics; PG-SGA 4-8 indicates need for dietician intervention

Results, cont

Exposure to chemotherapy is associated with higher likelihood of poor nutritional status (p <0.001)

Diagnosis of pancreatic cancer is associated with need for dietician intervention (p <0.001)

Conclusions

Nutrition status is significantly associated with treatment intolerance.

Systems are needed to triage at-risk patients to limited dietitian resources.

Future Directions

Why aren't high-risk patients seeing dieticians as outpatients?

Are these associations maintained if timing of diagnosis is narrowed to the last 5 years?

Is this generalizable to patients outside of the HCC in Pittsburgh, PA?