GCC Cancer Treatment Protocol Guidelines for Breast and Colorectal Cancer

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Original Article

Pre-Treatment Nutritional Status and Radiotherapy Outcome in Patients with Locally Advanced Head and Neck Cancers

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Abstract

Aim: Poor oral intake and associated nutritional depletion can affect treatment outcome in locally advanced head and neck cancers. The aim of this study was to evaluate the pre-radiotherapy nutritional status as a predictor for response to radiotherapy treatment.

Patients and Methods: Fifty patients of locally advanced head and neck cancers undergoing radical chemoradiotherapy were evaluated in this prospective analysis. Patients were treated with definitive radiotherapy to a total dose of 60–70 Gy along with concurrent chemotherapy with injection Cisplatin 100mg/m² delivered three weekly. The patients were evaluated for pre-treatment nutritional status using the Patient-Generated Subjective Global Assessment (PG-SGA) questionnaire. The PG-SGA evaluation was completed just before starting radiotherapy treatment and scores correlated to treatment outcome.

Results: Forty-seven male and three female patients were evaluated in this analysis. The median PG-SGA score was 8 with a range from 2–14. Grade 3–4 mucositis was seen in seven patients (21.8%) with PG-SGA <9 compared to 55.5% in those with PG-SGA ≥ 9 (p=0.01). At the time of evaluation a complete response was seen in 16 patients (32%) with a PG-SGA score < 9 compared to 4 patients (8%) with a PG-SGA ≥9 (p=0.05). The median survival was 16±2.8 months (Median ±S. Error) and 17±2.9 months in those with PG-SGA <9 and ≥9 respectively (p=0.49, log rank).

Conclusion: PG-SGA nutritional score <9 is associated with a better local control and acute toxicity profile in radically treated head and neck cancer patients

Keywords: radiotherapy, head and neck, PG-SGA

Introduction

Patients with locally advanced head and neck cancers are susceptible to having a poor nutritional status. Multiple factors including mechanical obstruction and symptoms caused by the disease, tobacco, alcohol abuse and a poor socio-economic status may contribute to this. The prevalence of malnutrition is reported to be 30–50 % in head and neck cancer patients.1,2 Poor oral intake and associated nutritional depletion can affect treatment outcome in locally advanced head and neck cancers. Nutritional evaluation done before starting treatment can help prevent treatment interruptions and improve the quality of life of patients.

Several screening tools like Patient-Generated Subjective Global Assessment (PG-SGA),3 Onodera’s Prognostic Nutrition Index (O–PNI), and Nutrition Risk Index (NRI)4 are validated for nutritional assessment in cancer patients. The PG–SGA tool comprises questions on medical history which are completed by the patient and a physical examination component which is completed by the treating physician. It assigns both a nutritional score and a triage category (Stage A, B&C) to the patient. The scores for different components range from 0–4. An overall score more than 9 puts a patient at risk of malnutrition and in need for nutritional intervention. The aim of the present study was to evaluate the pre-radiotherapy nutritional status using PG–SGA questionnaire and correlate its impact on the treatment outcome.

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Patients and Methods

Fifty patients of locally advanced head and neck cancers were evaluated in this prospective analysis. The inclusion criteria included patients more than 18 years of age, those planned for radical chemoradiotherapy and diagnosed with a non-nasopharyngeal head and neck cancer. Patients undergoing surgery and those treated with palliative intent were excluded from the analysis. All patients were staged as per the American Joint Committee on Cancer staging system (AJCC 2010). Patients were treated with definitive radiotherapy to a total dose of 60–70 Gy along with concurrent chemotherapy with injection cisplatin 100mg/m² delivered on days 1, 22 and 43 or 40 mg/m² given weekly during the course of radiotherapy. The patients were evaluated for pre-treatment nutritional status using the Patient-Generated Subjective Global Assessment (PG-SGA) questionnaire. The PG-SGA evaluation was completed just before starting radiotherapy treatment.

Statistical analysis was performed using SPSS. Descriptive statistics were generated for all variables under study. Univariate analysis was done using chi square test. Paired ‘t’ test was done to evaluate continuous variables. Response evaluation was done at time of analysis using Response Evaluation Criteria for Solid tumors (RECIST). Acute toxicity was evaluated using common terminology criteria for adverse events (CTCAE v3) and was defined as toxicity occurring within ninety days of treatment. Progression was considered as loco regional increase in disease or distant metastasis. Disease free survival was evaluated using Kaplan Meir analysis. A p value <0.05 was considered as statistically significant.

Results

Forty-seven male and three female patients were evaluated in this analysis. The median age of the study population was 53±11.14 years. Oropharyngeal tumors constituted 66 % (n=33) and oral cavity tumors 34% (n=17) of the study cohort. 88% (n=44) of the patients were diagnosed with stage III–IV disease. The mean haemoglobin at presentation was 13.74±1.68 gm% (mean ± standard deviation) with a range from 9.31 to 16.3 gm%. Haemoglobin <12gm% was present in 20% of patients. Weight loss more than 5% in the preceding six months was present in 44% of the patients.

The median PG–SGA score was 8 (range 2–14). Well nourished (PG–SGA stage A), moderately malnourished (PG–SGA stage B) and severely malnourished (PG–SGA stage C) patients were 28%, 54% and 18% respectively. 36% of the study subjects had a score >9 indicating urgent need for nutritional intervention prior to starting radiotherapy. Grade 3–4 mucositis was seen in seven patients (21.8%) with PGSGA < 9 compared to 55.5% in those with PG-SGA score ≥ 9 (p=0.01). Patients with PGSGA > 9 had a higher incidence of Grade 3–4 dysphagia (11.1%) (p=0.05) (Table1).

At time of evaluation a complete response was seen in 16 patients (32%) with a PG–SGA score < 9 compared to 4 patients (8%) with a PGSGA ≥ 9 (p=0.05).The median disease free survival (Fig.1) was 16±2.8months (Median ±S Error) and 17±2.9 months in those with PG–SGA <9 and ≥9 respectively (p=0.49,log rank).

Discussion

Multiple nutritional parameters including body mass index, total protein, serum albumin, C reactive protein, total lymphocyte count and weight loss have been evaluated in literature for nutritional assessment in head and neck cancer patients. Nutritional status can be a
potential prognostic factor for treatment outcome in head and neck cancers as it can impact the treatment compliance during a course of chemoradiotherapy. Treatment toxicity particularly mucositis occurring during the protracted course of chemoradiotherapy decreases the normal oral intake and adversely impacts the nutritional status. Wittenar et al reported a deterioration in nutritional status in 0–3 months after treatment. Few studies have correlated the pre–treatment nutritional status for predicting treatment related adverse events and locoregional failures in patients treated with definitive radiotherapy. Kono et al reported Onodera’s Prognostic Nutrition Index (O–PNI) <40 and a Controlling Nutrition Status (CONUT) score ≥ 5 to be associated with severe adverse events during radiotherapy.

Pre–treatment percentage of ideal body weight was associated with locoregional failure in pharyngeal and laryngeal cancers after concurrent chemoradiotherapy. Biological nutritional factors like serum albumin and C–reactive protein have been associated with overall survival in head and neck squamous cell carcinomas. Overall survival has also been correlated with nutritional index in laryngeal cancers undergoing curative laryngectomy.

Our results show 72% of our patients falling in PG–SGA stage B and C of malnutrition in the pre–treatment phase which is higher than that reported in literature. A correlation between malnutrition and increased incidence of mucositis (p< 0.01) and dysphagia (p= 0.05) was seen in our analysis. A loss of muscle and fat mass seen during concurrent chemoradiotherapy may explain this observation. A higher rate of complete responses was seen in patients having a better nutritional status (p=0.05) though it did not impact the median survival observed in our study.

PG–SGA is a simple and reliable method for evaluating pre–treatment nutritional status in cancer patients undergoing radical chemoradiotherapy and helps to identify subsets of patients likely to have increased toxicity and poorer treatment outcomes. This can help in better management and nutritional support for these patients.

Conclusion

The present analysis highlights the importance of pre–treatment nutritional evaluation in head and neck cancer patients. PG–SGA nutritional score <9 is associated with a better local control and lower incidence of mucositis in radically treated head and neck cancer patients. Nutritional evaluation using PG–SGA should be included in the pre–treatment work up of head and neck cancer patients.

References

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