ORIGINAL ARTICLE

PROGNOSTIC EVALUATION OF GERIATRIC NUTRITIONAL RISK INDEX IN GERIATRIC PATIENTS WITH HEAD AND NECK CANCER

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Abstract

Introduction: The aim of this study is to evaluate the prognostic effect of Geriatric Nutritional Index screening performed before oncological treatments in geriatric age group locally advanced head and neck cancer patients.

Materials and Method: Eighty-two patients diagnosed at geriatric age between January 2016 and November 2024 were included in the study. All patients had locally advanced disease (Stage 3 and Stage 4 disease). Age, tumor diameter, body mass index, Geriatric Nutritional Index, neutrophil-lymphocyte ratio , platelet-lymphocyte ratio , c-reactive protein, hemoglobin, lactate dehydrogenase, and primary tumor standardized uptake value maximum (pSUVmax) numerical variables were analyzed. Geriatric Nutritional Index was divided into four subgroups; patients with> 98 were considered as no risk for malnutrition, patients with≤ 98 and ≥ 92 were considered as mild risk, patients with< 92 and ≥ 82 considered as moderate risk and patients with< 82 considered as high risk.

Results: The median overall survival of the patients was 16.5 months. The median overall survival of patients with severe-risk Geriatric Nutritional Index was 5 months, while the median overall survival of patients with no-risk group was 44 months (p=0.067). In multivariate Coxregression analysis Geriatric Nutritional Index was identified as the single factor independently affecting survival (p: 0.032).

Conclusion: Geriatric Nutritional Index gave a comparable result with clinical and laboratory parameters known to have an effect on prognosis. Especially in geriatric patients, who are a group vulnerable to neglect in terms of treatment, a practical evaluation and Geriatric Nutritional Index calculation before oncological process planning may be guiding in terms of creating a survival prediction and deciding on the treatment process.

Keywords: Geriatrics; Head and Neck Neoplasms; Nutrition Assessment; Mortality; Aged.

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INTRODUCTION

Head and neck cancers account for approximately 3% of all cancer types but are associated with high mortality rates (1). Globally, an estimated 878,000 new cases are diagnosed each year, with annual fatalities reaching up to 444,000 (2). Despite advances in treatment modalities, the global 5-year survival rate remains around 50% (3). These cancers, which originate from the epithelium of the upper aerodigestive tract, are distributed across various anatomical sites, including the pharynx, larynx, nasal cavity, oral cavity, salivary glands, and paranasal sinuses. Due to both tumor localization and treatment-related complications following surgery or oncologic therapies, patients experience symptoms such as dysphagia, odynophagia, dysgeusia, and xerostomia, factors that contribute to a higher risk of malnutrition compared to other cancer types (4). Malnutrition-related mortality across all cancer types can reach up to 20% (1). This risk is particularly pronounced in the geriatric population, who are often frail and burdened with multiple comorbidities, making them more vulnerable to cachexia.

The European Society for Clinical Nutrition and Metabolism (ESPEN) recommends that nutritional screening be conducted for all cancer patients, including those diagnosed at early stages (1). Nutritional support initiated at the beginning of treatment and maintained throughout has been shown not only to improve quality of life but also to reduce treatment-related toxicity and lower the risk of mortality (5). While body mass index (BMI) is a commonly used and well-known parameter for nutritional screening, its standalone diagnostic utility is limited (6). Parameters that reflect both metabolic processes and body composition, rather than relying solely on height and weight, provide more accurate assessments. Accordingly, several nutritional screening tools have been developed, including the Nutritional Risk Index (NRI), Global Leadership Initiative on Malnutrition (GLIM) criteria, Geriatric Nutritional Risk Index (GNRI), and Prognostic Nutritional Index (PNI). This risk index, specifically defined for the geriatric age group, was first identified by Bouillanne O, et al. and colleagues as predictive of mortality and morbidity in a prospective study of elderly hospitalized patients(7).The GNRI, frequently used in geriatric populations, has been identified in several studies as a significant prognostic factor in patients with head and neck cancers, helping predict postoperative complications, survival outcomes, and treatment-related adverse effects (8–11). However, most of these studies involve heterogeneous patient populations with respect to age, and only a few have specifically targeted geriatric cohorts. One of these studies included preoperative evaluation in patients with oral squamous cell carcinoma and the other included pretreatment evaluation in patients with locally advanced head and neck cancer (LAHNC) treated with a tri-weekly cisplatin protocol(12,13). Demonstrating its prognostic impact in the elderly oncological patient group, those diagnosed with head and neck cancer, which can be considered the most nutritionally vulnerable, is invaluable for this fragile patient group, which is often confused about treatment approaches, as supported by these studies. By incorporating both serum albumin levels and the ratio of actual to ideal body weight, the GNRI offers a practical yet comprehensive method for assessing malnutrition.

In our study, we investigated the impact of GNRI assessment on survival before adjuvant or definitive oncological treatment in geriatric patients with LAHNC. We also compared it with clinical factors known to influence disease prognosis, including body mass index, neutrophil-lymphocyte ratio, platelet-lymphocyte ratio, c-reactive protein, hemoglobin, and lactate dehydrogenase.

MATERIALS AND METHOD

Research Protocol

91 patients aged 65 years and older who had been diagnosed with LAHNC at our institution between January 2016 and November 2024 were included

in the study. Patients were excluded if they lacked laboratory data, had no pathological diagnosis, were younger than 65, or had incomplete follow-up information. The study group comprised patients with squamous cell carcinoma located in the oral cavity, HPV-negative oropharynx, EBV-negative nasopharynx, hypopharynx, and larynx. Patients with EBV-positive nasopharyngeal carcinoma, HPV-positive oropharyngeal carcinoma, cervical esophageal carcinoma, stage I and stage II disease, and non-squamous cell carcinoma pathologies were excluded (Figure 1). Pre-treatment laboratory parameters were reviewed to calculate the GNRI, neutrophil-to-lymphocyte ratio (NLR), and platelet-to-lymphocyte ratio (PLR). Other laboratory values assessed included C-reactive protein (CRP), hemoglobin, lactate dehydrogenase (LDH), and albumin. Additional variables analyzed were age, sex, tumor size, T stage, N stage, TNM stage (AJCC 8th edition), number of metastatic lymph nodes, BMI, radiotherapy history, radiotherapy intent (definitive, adjuvant, palliative), and history of chemotherapy.

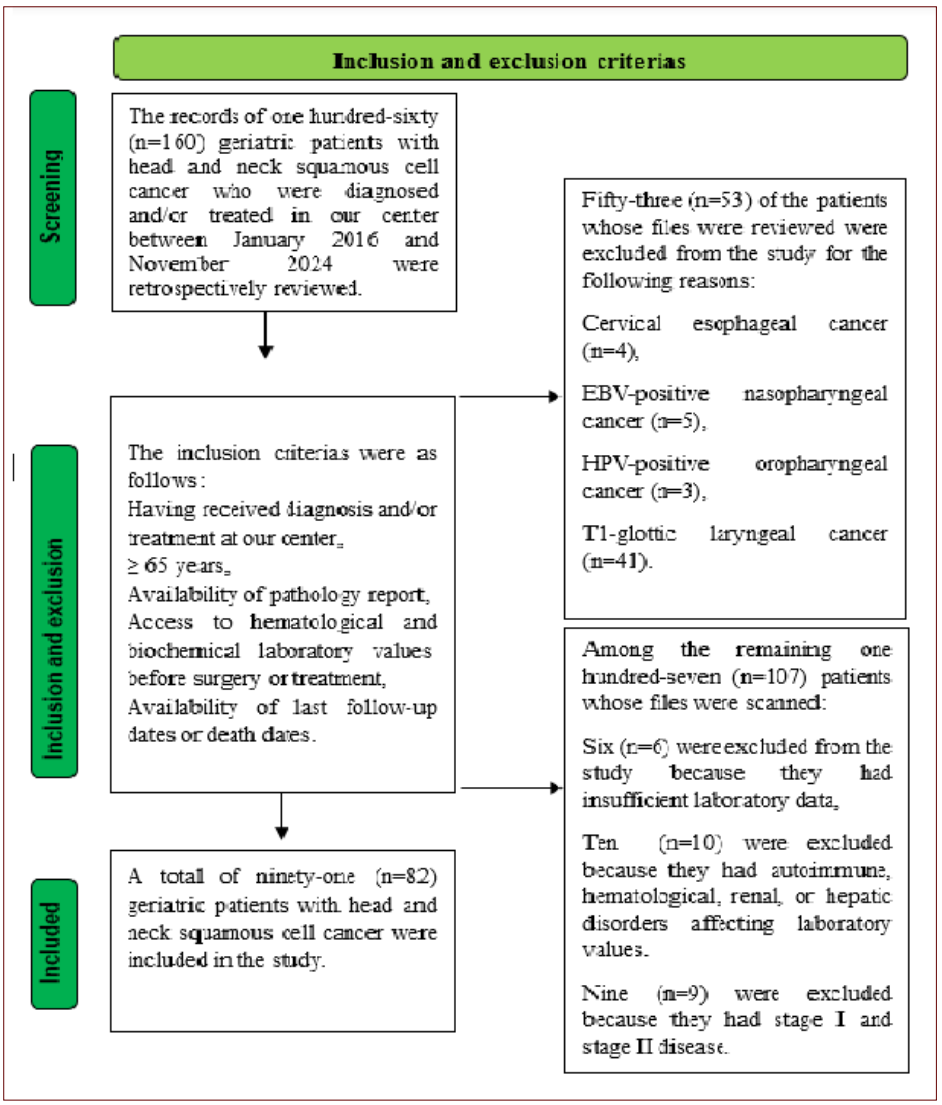

Figure 1. Inclusion and exclusion criterias

The steps of inclusion and exclusion from the study are shown in the flow diagram.

The GNRI was calculated using the following formula:

GNRI = (1.489 × albumin [g/dL]) + (41.7 × actual body weight / ideal body weight) (14). Ideal body weight (Wlo) was determined according to the Lorentz formula.

Geriatric Nutritional Index was divided into four subgroups;

patients with> 98 were considered as no risk for malnutrition,

patients with ≤ 98 and ≥ 92 were considered as mild risk,

patients with < 92 and ≥ 82 considered as moderate risk,

patients with < 82 considered as high risk.

Ethics Committee Approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the local ethics committee (Kayseri City Education and Research Hospital-Date/Number:25.03.2025 / 379).

Statistical Analysis

Power analysis was used to calculate the target sample size. Receiver operating characteristic (ROC) analysis was conducted to determine the cut-off values for numerical variables (age, tumor size, albumin, hemoglobin, LDH, CRP, NLR, PLR, BMI).

IBM SPSS version 21 (SPSS Inc., Chicago, IL, USA) was used for data analysis. Results are presented as frequencies, percentages, and medians (min–max). The Shapiro-Wilk test, along with histograms and Q-Q plots, was used to assess normality. Between-group comparisons were made using chi-square tests. Spearman's correlation test was used to analyze relationships between variables. Kaplan–Meier estimation and Cox regression methods were employed to assess and compare overall survival. Hazard ratios were calculated using Cox regression analysis with 95% confidence intervals. A p-value <0.05 was considered statistically significant.

RESULTS

The distribution of diagnoses among the 82 patients aged 65 years and older was as follows: 11 nasopharyngeal (12.2%), 5 oropharyngeal (6.1%), 4 hypopharyngeal (4.9%), 51 laryngeal (56.1%), and 20 oral cavity (20.7%) cancers. The cohort included 75 male (91.5%) and 7 female (8.5%) patients. The median overall survival (mOS) was 16.5 months. The median age at diagnosis was 70 years (range: 65–87). Lymph node involvement was observed in 49 patients (59.8%)and most of them (29.3%) had more than 4 positive lymph nodes. The distribution of clinical stages was: stage III – 34 (41.5%), and stage IV – 48 (58.5%) (Table 1).

Table 1. Patient's clinical, tumoral, and laboratory characteristics

Variables	Number (n=82)
Gender	
Female	7 (8.5%)
Male	75 (91.5%)
Age (years), median (range)	70 (65-87)
<69.5	40 (48.8%)
≥69.5	42 (51.2%)
Anatomic location	
Laryngeal	46 (56.1%)
Oral cavity	17 (20.7%)
Nasopharyngeal	10 (12.2%)
Oropharyngeal	5 (6.1%)
Hypopharyngeal	4 (4.9%)

Table 1. Continued...	
Tumor size (cm), median (range)	3 (0.2-10)
<2.95	40 (48.8%)
≥2.95	42 (51.2%)
T stage	
T1	13 (15.9%)
T2	12 (15.9%)
T3	27 (32.9%)
T4	29 (35.4%)
N stage	
N0	29 (35.4%)
N1	25 (30.5%)
N2	17 (20.7%)
N3	11 (13.4%)
TNM stage	
Stage III	34 (41.5%)
Stage IV	48 (58.5%)
Operation history	
Yes	52 (63.4%)
No	30 (36.6%)
Lymph nodal involvement	
Yes	33 (40.2%)
No	49 (59.8%)
Primary tumor SUVmax value, median (range)	13.59 (2.71-38.80)
<14.125	31 (37.8%)
≥14.125	28 (34.1%)
No PET-CT scanning	23 (28%)
GNRI, median (range)	103 (72-118)
> 98, no risk	51 (62.2%)
≤ 98, ≥ 92, mild risk	11 (13.4%)
< 92, ≥ 82, moderate risk	15 (18.3%)
< 82, severe risk	5 (6.1%)
BMI (kg/m^2), median (range)	23.88 (14.04-47.74)
≥ 24.04	38 (46.3%)
<24.04	44 (53.7%)
LDH (U/L), median (range)	213 (93-478)
<211	40 (48.8%)
≥211	42 (51.2%)
CRP (mg/dL), median (range)	8.35 (0.2-198.2)
<8.05	40 (48.8%)
≥8.05	42 (51.2%)
NLR, median (range)	3.13 (0.87-22.23)
<3.13	41 (50%)
≥3.13	41 (50%)
PLR, median (range)	143.31(21.74-593.42)
<143.31	41 (50%)
≥143.31	41 (50%)

Table 1. Continued...	
Hemoglobin (g/dL), median (range) ≥14.05 <14.05	14 (8.8-17.7) 40 (48.8%) 42 (51.2%)
Albumin (g/dL), median (range) ≥4.15 < 4.15	4.15 (2.51-5.1) 38 (46.3%) 44 (53.7%)
RT history Yes No	 79 (96.3%) 3 (3.7%)
RT intent Definitive Adjuvant Palliative No RT	 28 (34.1%) 48 (58.5%) 3 (3.7%) 3 (3.7%)
CT history Yes No	 58 (70.7%) 24 (29.3%)
PFS event Yes No	 53 (64.6%) 29 (35.4%)
Survival status Survi Ex	 38 (46.3%) 44 (53.7%)

Abbreviations: SUVmax; Standardized uptake value maximum, PET-CT; Positron emission tomography, GNRI;Geriatric nutritional risk index, BMI; Body mass index, LDH; Lactate dehydrogenase, CRP; C reactive protein, NLR; Neuthrophil to lymphocyteratio, PLR; Platelet to lymphocyte ratio, RT; Radiotherapy, CT; Chemotherapy, PFS; Progression-free survival

Based on ROC analysis, the determined cut-off values for numerical variables were as follows: age 69.5, tumor diameter 2.95 cm, albumin 41.5 g/L, BMI 24.04, LDH 211, CRP 8.05, NLR 3.13, PLR 143.31, primary tumor standardized uptake value maximum (pSUVmax) 14.125, and hemoglobin 14.05 g/dL. Patients were primarily categorized into four GNRI groups: no risk (>98, n=51), mild risk (92–98, n=11), moderate risk (82–92, n=15), and severe risk (<82, n=5).

In the survival analysis, the mOS for the GNRI-based groups was 44 months in the no-risk group and 5 months in the severe-risk group (Figure 2). For BMI, the mOS was 36 months in patients with BMI <24.04 and 33 months in those with BMI ≥24.04 (p = 0.917). For CRP, the mOS was 50 months in patients with CRP <8.05, compared to 25 months in those with CRP ≥8.05(p = 0.111). The mOS was 44 months for NLR <3.13 and 25 months for NLR ≥3.13(p = 0.232). For PLR, the mOS was 48 months for PLR <143.31 and 27 months for PLR ≥143.31 (p = 0.639). In patients with hemoglobin ≥14.05 g/dL and <14.05 g/dL, the mOS was 40 and 33 months, respectively (p = 0.539).In albumin evaluation, mOS was 48 months in those with >41.5 and 27 months in those with <41.5 (p=0.107). Regarding tumor diameter, patients with tumors <2.95 cm had an mOS of 42 months versus 27 months for those with tumors ≥2.95 cm (p = 0.386).

From a clinical standpoint, patients aged <69.5 had an mOS of 44 months, while those aged ≥69.5 had an mOS of 36 months (p = 0.454). Patients who received radiotherapy (RT) had a median overall survival of 40 months, compared to 1 months in

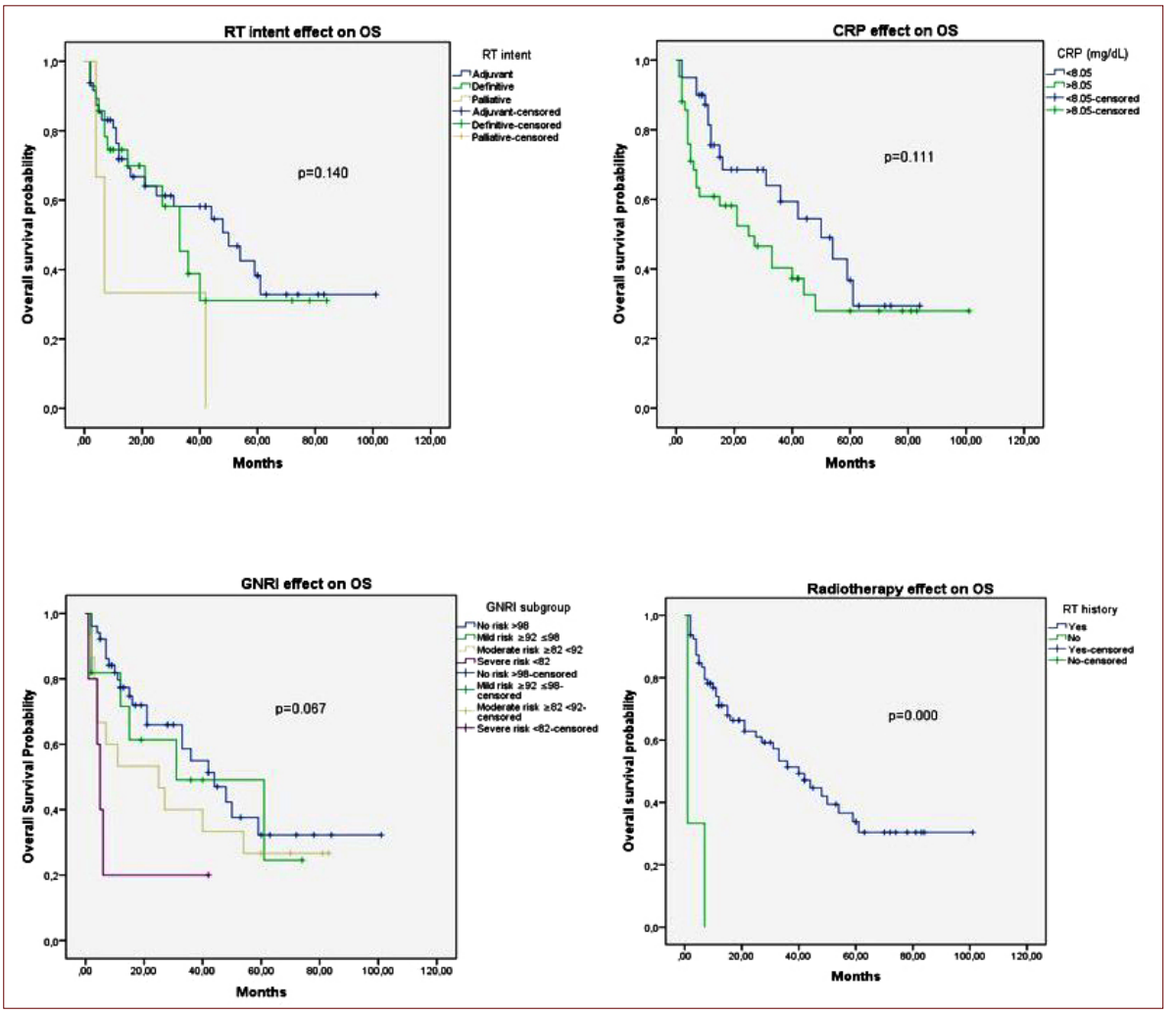

Figure 2. Kaplan-Meier Survival graphs

Survival graphs of laboratory parameters in terms of overall survival

those who did not receive RT (p = 0.000). However, the number of patients who did not receive RT was limited to only three, potentially introducing bias. Three of the patients who did not receive RT were stage 4, two with oropharyngeal malignant neoplasm, and one with hypopharyngeal malignant neoplasm. Two patients survived 1 month after diagnosis, while one survived 7 months. One of the patients who survived 1 month after diagnosis had stage 4 hypopharyngeal cancer and died due to respiratory distress and a fatal infectious event after diagnosis. The other patient had stage 4 oropharyngeal cancer and died due to persistent infection after diagnosis. The patient with stage 4 oropharyngeal cancer who survived 7 months refused treatment and died due to disease progression. Regarding RT intent, the mOS was 50 months for adjuvant RT, 33 months for definitive RT, and 7 months for palliative RT (p = 0.140), which is an expected result and supports the appropriateness of RT indications. In addition, stage 3 patients survived for 48 months, while stage 4 patients survived for 33 months (p=0.363).

In the univariate Cox regression analysis of factors affecting survival, GNRI was identified as the only prognostic factor that statistically significantly affected survival(Hazard Ratio(HR):3.735, %95CI: 1.273-10.964, p: 0.016) (Table 2). In the multivariate Cox regression analysis, GNRI was identified as the single significant prognostic factor (HR:1.376, %95CI: 1.027-1.843, p: 0.032) (Table 2).

Table 2. Evaluation of the effect of clinical and laboratory parameters on overall survival (Univariate and Multivariate Cox regression analyzes)

Univariate Cox regression analysis			
Variables	**HR**	**95%CI**	***p***
Age	1.252	0.689-2.275	*0.460*
Gender	1.235	0.382-3.991	*0.725*
TNM stage	1.319	0.720-2.416	*0.369*
Tumor size	1.297	0.715-2.351	*0.392*
Primary tumor SUVmax	0.844	0.413-1.726	*0.642*
BMI	1.032	0.570-1.867	*0.917*
Albumin	1.661	0.885-3.116	*0.114*
GNRI			
No risk	Ref	Ref	*0.098*
Mild risk	1.251	0.509-3.079	*0.625*
Moderate risk	1.568	0.759-3.239	*0.224*
Severe risk	3.735	1.273-10.964	***0.016***
LDH	0.936	0.516-1.697	*0.827*
CRP	1.618	0.885-2.957	*0.118*
NLR	1.384	0.788-2.591	*0.239*
PLR	1.151	0.635-2.087	*0.643*
Hemoglobin	1.202	0.664-2.177	*0.544*
RT history	11.597	3.337-40.302	***0.000***
RT intent			
Adjuvant	Ref	Ref	*0.173*
Definitive	1.243	0.638-2.419	*0.523*
Palliative	3.163	0.938-10.659	***0.063***
Multivarite Cox regression analysis			
Variables	HR	95%CI	*p*
GNRI	1.376	1.027-1.843	***0.032***

Abbreviations: SUVmax; Standardizeduptakevaluemaximum, PET-CT; Positronemissiontomography, GNRI;Geriatricnutritional riskindex, BMI; Body massindex, LDH; Lactatedehydrogenase, CRP; C reactive protein, NLR; Neuthrophil to lymphocyteratio, PLR; Platelet to lymphocyteratio, RT; Radiotherapy.

$p < 0.05$ was accepted statistically significant and shown in bold.

DISCUSSION

In geriatric patients with LAHNC, concerns regarding tumor location and treatment-related toxicity may limit the application of oncologic definitive approaches. In addition to patients' biological age, the presence of comorbidities often complicates clinical decision-making regarding definitive oncologic treatment. For this vulnerable age group, preliminary evaluations and prognostic scoring systems are particularly valuable in guiding oncological treatment planning (15). Several studies, regardless of age group, have demonstrated the prognostic importance of nutritional indices such as GNRI and PNI in patients with head and neck cancer (16,17). However, most of these studies have excluded geriatric patients. However, it is a well-known fact that the geriatric age group constitutes an increasing proportion of the world population and oncologic patient population (18). In elderly patients with head and neck cancer, whose treatment is inherently complex and associated with high risks, prognostic tools that are practical, time-efficient, and cost-effective are of substantial clinical value.

One of the studies conducted in this context is by Fujiwara Y et al., which evaluated the prognostic significance of GNRI in elderly patients with head and neck cancer receiving definitive chemoradiotherapy with a three-week cisplatin protocol (12). In this study, patients aged 65 and over, predominantly in stages T2-3 and N0-1-2, who were treated according to a specific regimen, were assessed. GNRI was categorized as >98 (high GNRI) and ≤98 (low GNRI). Among a total of 111 patients, 88 had high GNRI and 23 had low GNRI. Most patients had oropharyngeal, hypopharyngeal, or laryngeal cancer (HPV and EBV status were not differentiated in the cohort). In this specific cohort, factors affecting survival included stage 4 disease, N2 or higher disease, and high GNRI (p-values: 0.021, 0.026, and 0.048, respectively). In multivariate analysis, N2 or higher disease and high GNRI were identified as independent factors (HR: 4.37, 95% CI: 1.58–12.06, p=0.004; HR: 0.31, 95% CI: 0.64–4.17, p=0.029). In our study, 82 patients aged 65 and older, the all of whom were stage 3 or 4, were included. Unlike Fujiwara Y et al.'s study, our cohort predominantly consisted of patients with laryngeal cancer, and patients with HPV- and EBV-positive oropharyngeal and nasopharyngeal cancers, were excluded due to prognostic heterogeneity. Additionally, our cohort included the small number of patients who did not receive radiotherapy (3.7%). Regarding GNRI, the four-group classification was conducted. Of the total, 51 patients were in the no-risk group and 5 in the severe-risk group. While GNRI was also identified as an independent factor affecting overall survival in our study, similar to Fujiwara Y et al. Although GNRI maintained its role as an independent prognostic factor in both studies, its effect on survival was found to be stronger in our study (HR values: 0.31 vs. 1.376).

Another study was conducted by Yamahara K et al., which evaluated the predictive effects of pretherapeutic nutritional and inflammatory parameters in patients with early and advanced stage head and neck cancer (8). In this study, which included 164 patients of all ages, the primary tumor sites were larynx (46.3%), hypopharynx (24.4%), oropharynx (15.2%), oral cavity (8.5%), and nasal cavity (5.5%), with nasopharyngeal cancer excluded. In addition to GNRI, NLR, PLR, modified Glasgow Prognostic Score (mGPS), CRP/albumin ratio (CAR), hemoglobin, albumin, and BMI were analyzed. GNRI was divided into four categories: 92 patients <82 (high risk, 56.1%), 39 patients 82–92 (moderate risk, 68.3%), 25 patients 92–98 (low risk, 15.2%), and 8 patients >98 (normal, 4.9%). In univariate Cox regression analysis, factors affecting 3-year overall survival included T stage, TNM stage (early vs. advanced), hemoglobin, GNRI, PLR, NLR, mGPS, and CAR (p-values: <0.001, 0.036, <0.001, <0.001, 0.002, 0.03, 0.03, and 0.002, respectively). In multivariate Cox regression analysis, only GNRI was identified as an independent factor (normal vs. high:

HR: 0.06, 95% CI: 0.02–0.17, p<0.001; low vs. high: HR: 0.18, 95% CI: 0.06–0.52, p<0.001). The survival analyses also showed that GNRI value showed a statistically significant difference in survival in early and advanced stages, in tumor sites including larynx, oropharynx, and hypopharynx, and in treatment types involving both surgery and radiotherapy (p-values: <0.001, <0.001, <0.001, <0.05, <0.05, <0.001, and <0.001, respectively). Although our study also included a heterogeneous set of tumor sites, it exclusively focused on patients aged ≥65. In contrast to this study, only the advanced stage disease group was included in our study. Similar to this study, we also evaluated the GNRI subgroups by dividing them into four. In addition, similar to their study, we also evaluated NLR, PLR, hemoglobin and BMI values; however, none of these showed a significant impact on survival. This lack of effect may be attributed to the limited number of patients in our study and the limited age group and similar stage patients. Although mGPS and CAR were not assessed in our study, CRP, LDH, and albumin levels were analyzed. GNRI was also identified as the independent prognostic factor in our study, with a notably higher hazard ratio compared to theirs (HR values: 0.18 vs. 1.376), possibly due to the final analysis being conducted using a binary classification.

In the study by Yamagata G. et al., which investigated the predictive value of GNRI in patients with oral squamous cell carcinoma, data from a total of 155 patients were analyzed. The GNRI cut-off value was set at 98, and patients were divided into two groups: low GNRI (≤98) and high GNRI (>98) (19). In addition, PNI, BMI, and albumin values were also evaluated. As for treatment modalities, patients were grouped as surgery only, surgery + RT±CT, or RT only, and patients who did not undergo any intervention or treatment were excluded from the study. The OS rates in the high and low GNRI groups were 76.4% and 29.2%, respectively (p<0.001). In univariate Cox regression analysis, age (<70.4 vs. ≥70.4), T stage (T1–2 vs. T3–4), N stage (N0–1 vs. N2–3), TNM stage (I–II vs. III–IV), BMI (≥18.5 vs. <18.5), PNI (≥49.3 vs. <49.3), GNRI, and albumin (≥3.5 vs. <3.5) were identified as factors affecting survival (p-values: 0.023, 0.007, 0.018, 0.01, 0.004, 0.001, <0.001, and <0.001, respectively), while age, stage, and GNRI were identified as independent prognostic factors (HR: 2.184, 95% CI: 1.119–4.261, p=0.022; HR: 2.684, 95% CI: 1.457–5.367, p=0.011; HR: 4.559, 95% CI: 2.172–9.570, p<0.001). Although this study focused on a specific diagnostic cohort, the age group was heterogeneous. While the GNRI cut-off value was different from that in our study, GNRI continued to stand out as a prognostic factor with a high hazard ratio. This strong effect might be attributable to the homogeneity of the cohort in terms of diagnosis. Additionally, while numerical variables such as NLR, PLR, CRP, and LDH, which are available in our study, were not assessed in this study, the PNI, which we did not evaluate, was included. Although age is typically observed as a prognostic factor in studies including all age groups, as seen in this study, it had no effect on survival in our study. Also, categorizing the stage variable into two groups, which was not statistically significant in our study, might have contributed to the significance in theirs.

In another study conducted by Nakayama M. et al., which focused on a different outcome, the predictive role of pre-treatment GNRI values in anticipating side effects in patients with head and neck cancer receiving chemoradiotherapy was investigated (10). This study included a total of 82 patients from all age groups who received concurrent chemoradiotherapy, and patients were divided into two groups according to GNRI values: low GNRI (<98) and high GNRI (≥98). In addition, the mGPS was also analyzed. Total RT dose and cumulative CT dose were evaluated as guiding variables for side effect prediction. Striking findings regarding GNRI's effects on side effects were observed in the low GNRI group, which had significantly higher

rates of grade 3 or higher leukopenia, mucositis, and dermatitis (p-values: 0.001, 0.035, and 0.035, respectively). Regarding patient distribution, all patients in the high GNRI group had an mGPS score of zero ($p<0.001$). A statistically significant favorable distribution was also observed in favor of the high GNRI group in terms of BMI ($p<0.001$). Most N3 patients were in the low GNRI group, whereas most N0 and N1 patients were in the high GNRI group ($p=0.005$). In our study, the treatment group evaluated from a prognostic standpoint was more heterogeneous. Although our study was more homogeneous in terms of age, side effect evaluations could not be performed due to missing patient data. While our study included numerical values such as NLR, PLR, CRP, LDH, and albumin, which were not evaluated in this study, mGPS, a combined measure of CRP and albumin, was analyzed. The patient cohort consisted of laryngeal, nasopharyngeal, oropharyngeal, hypopharyngeal, oral cavity, and head and neck cancers of unknown primary origin. Except for the unknown primary group, it shows similarities with our cohort. While the dominant anatomical site in our study was the larynx, in this study, the oropharynx stood out (37%). This study, which assessed GNRI from a completely different perspective, demonstrated its predictive power not only for disease prognosis, as shown in both the literature and our study, but also for side effect predictability.

The limitations of our study include its single-center, retrospective nature; lack of side effect data, and the heterogeneity of diagnoses and treatment groups. In addition, another limitation is that the wide range in laboratory parameters such as CRP and LDH may have a negative effect on the albumin level and this may affect the results. Another potential shortcoming is the lack of consensus in the literature regarding GNRI cutoff values. Comparing our reference grouping with studies that do not use the same method may not be a sound approach. However, this is understandable given the limited number of studies available on patients diagnosed with geriatric head and neck cancer. Its original aspects are the inclusion of various numerical parameters(BMI, NLR, PLR, CRP, LDH) alongside GNRI in a specific age group, the analysis of variables such as the history of RT, and RT intent.

CONCLUSION

GNRI appears to be a strong prognostic predictor in geriatric patients with LAHNC. In this frail and difficult-to-treat patient population, a simple and cost-effective calculation in clinical practice may offer prognostic insights, enabling the planning of oncologic treatment and early enteral nutritional support.

Ethics Approval: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Kayseri City Education and Research Hospital (25.03.2025/ 379).

Competing Interests: The authors have no relevant financial or non-financial interests to disclose.

Consent to Participate: Not applicable.

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