Journal of Oncological Science 2 (2016) 77–81

Contents lists available at ScienceDirect

Journal of Oncological Science

journal homepage: https://www.elsevier.com/locate/jons

Original Article

Effects of educational status and the living environment on the prognosis of head and neck squamous cell carcinoma

Zeynep Oruç [a, *], M. Emin Büyükbayram [b], Muhammet Ali Kaplan [a], Zuhat Urakçı [a], Mehmet Küçüköner [a], Abdurrahman Işıkdoğan [a]

[a] Dicle University Medical Faculty Medical Oncology Department, Diyarbakır, Turkey
[b] Dicle University Medical Faculty Internal Medicine Department, Diyarbakır, Turkey

ARTICLE INFO

Article history:
Received 14 April 2016
Accepted 8 August 2016
Available online 24 October 2016

Keywords:
Socioeconomic status
Head and neck cancers
Educational status
Living environment

ABSTRACT

Introduction and purpose: Educational status and the living environment are closely related to the survival rates of patients with head and neck cancer. In this study we evaluate the effects of educational status and the living environment on the survival of patients with head and neck cancer.
Materials and methods: Patients with head and neck tumors that show squamous cell histological properties were included in the study. Cases had been followed up in Dicle University Medical Faculty Medical Oncology clinic between January 2006 and June 2013. Data was collected retrospectively from the medical records of the patients. Classical parameters, which are considered to affect the prognosis, such as age, gender, stage, tumor localization and performance status, were investigated, in addition to educational status and the living environment.
Results: The study comprised 171 cases. The rate of metastatic disease was determined to be higher in illiterate patients, when compared to ones with at least an elementary school or higher education (12.7% and 8.1%, respectively; $p = 0.012$). Similarly, patients living in rural areas showed higher rates of metastatic disease, when compared to those living in cities (16.3% and 8.0%, respectively; $p = 0.146$). It was determined that the educational status (median overall survival in the cases with elementary school or higher education 21.5 months; in cases that cannot read or write, it is 10.3 months; $p = 0.001$) and the environment being lived (median overall survival in cases living in cities 17.6 months; in cases living in rural areas it is 9.0 months; $p = 0.014$) affect survival in the patients with head and neck cancer. In the multivariate analysis; age (>60 vs < 60, OR: 1.94, 95% CI 1.19–3.17, $p = 0.008$), educational status (cases that cannot read or write vs elementary school or higher, OR: 1.64, 95% CI: 1.03–2.62, $p = 0.037$) and stage (early stage vs local advanced stage, OR: 3.07, 95% CI: 1.58–5.94, $p = 0.01$, early stage vs late stage, OR: 3.49, 95% CI: 1.52–8.03, $p = 0.003$) were determined to be independent prognostic factors.
Discussion: In addition to the classical prognostic factors, educational status was also determined to be an independent prognostic factor in the squamous cell head and neck cancers, and this fact was especially related with late diagnosis. The prognostic effect of living in rural area was determined by univariate analysis; however it was not determined to be an independent prognostic factor in the multivariate analysis.

1. Introduction

Head and neck cancers are among the most frequently observed cancer types in the world.[1] Distinct worldwide geographical differences exist in the anatomical distributions and incidences of head and neck cancers. Regional differences in the use of alcohol and tobacco, which contributes to the development of 80% of the head and neck cancers, are considered to be responsible for this fact. As a result of decreased tobacco use in the developed countries, incidences of larynx and oral cavity cancers in particular, decrease[2]; on the contrary, incidences of oropharyngeal squamous cell carcinoma have been determined to increase. This increase is explained by the increased frequency of exposure to high-risk subtypes of HPV.[2,3] Though variations exist in the incidences of

* Corresponding author.
E-mail address: zeynep44oruc@hotmail.com (Z. Oruç).
Peer review under responsibility of Turkish Society of Medical Oncology.

http://dx.doi.org/10.1016/j.jons.2016.08.001

head and neck cancers in developed countries, they are still observed in the highest rates in developing countries.

It is known that cancer survival can be affected by socioeconomic status.[4,5] Various studies have been performed to investigate the effects of socioeconomic conditions (occupation, education, living environment) on the risk and survival rates of head and neck cancer.[6–8] These studies indicated that cases with low socioeconomic level carry higher risks for head and neck cancers, when compared to those with higher socioeconomic level. However when other risk factors like alcohol and tobacco are considered, the importance of this finding is observed to decrease and a strong relation with other risk factors for head and neck cancers continue to exist.[6] In a study by Olsen et al of 9683 patients with head and neck cancers, the relation of socioeconomic level with the survival of head and neck cancer was evaluated. Rates of mortality risk at diagnosis for each subtype of head and neck cancer were determined to be higher in those patients with low socioeconomic level (low income and low educational status) and in those living in rural areas.[7] However, the complex relation of head and neck cancers with socioeconomic conditions has not yet been fully clarified. The aim of the present study is to determine the effects of educational status and the living environment on the survival of patients with head and neck squamous cell cancer.

2. Materials and methods

In our study, the medical records of patients with squamous cell head and neck tumors were investigated retrospectively; the patients had been followed up in Dicle University Medical Faculty Medical Oncology clinic between January 2006 and June 2013. Demographic, clinical and histopathological data of the patients were obtained from their medical and hospital records. Furthermore, parameters considered to affect the prognosis, such as age, gender, stage, tumor localization and performance status were investigated, in addition to educational status and the environment being lived.

The patients were separated to two groups, according to where they lived: ones from city centers, and ones not from the cities. The patients that are not from the city centers (from villages and small villages) were considered to be from the rural areas. These two groups, ie those from the rural areas and the others from the centers (city and town centers), were evaluated with regard to their survival rates. The patients were separated to two further groups, by assessing their educational and literacy levels; the ones that cannot read or write, and the others with at least an elementary education, or higher (elementary education, high school, university). These groups were also evaluated with regard to survival rates.

By considering the stages (according to the TNM staging system), cases were categorized according to local and local advanced stages (one group), and metastatic stages (the other group); the survival rates of these groups were also evaluated. The performance status of the patients was evaluated during application, using the Eastern Cooperative Oncology Group (ECOG) scoring system. One group involved the cases with ECOG 0 and 1, and the other group included the cases with ECOG 2,3 and 4; the survival rates of these two groups were also investigated.

Statistical analysis was performed using the SPSS 18.0 software program. Univariate analysis was applied to evaluate links to age, gender, ECOG performance status, stage (local, local advanced/metastatic), tumor localization (nasopharynx/nonnasopharynx) and mortality risk. These variables were also evaluated by multivariate analysis. Frequency tables were illustrated, and data analyzed using the Chi-square test and the Mann–Whitney U test. The Kaplan Meyer method was used in evaluating survival rates. A p value < 0.05 was accepted as statistically significant.

3. Results

The study included 171 patients, most of who were males (n = 149, 87.1%). The median age was 60 (13–93) years. The most frequent localization was found to be larynx (n = 107, 63%). 68% (n = 116) of the patients were of ECOG performance status 0–1, and 32% (n = 55) were of ECOG performance status 2 or higher. 10.2% (n = 17) of the patients were of late (metastatic) stage at diagnosis, 28.1% (n = 48) were of local stage, and 61.7% (n = 106) were of local advanced stage. 77% (n = 132) were from city centers, and 23% (n = 39) were from rural areas. 46% (n = 79) of the patients included ones that cannot read or write, and 54% (n = 92) included cases with at least elementary education. Rate of metastatic disease was determined to be higher in the patients that cannot read or write, when compared to ones with at least elementary or higher education (12.7% and 8.1%, respectively; p = 0.012). Similarly, patients living in rural areas showed higher rates of metastatic disease, when compared to those living in cities (16.3% and 8.0%, respectively; p = 0.146) (Table 1). Stage distributions of the patients from rural areas, when diagnosed at their application, were as follows: late stage 16.3% (n = 6), local advanced stage 65.1% (n = 25), and localized stage 18.6% (n = 8). For the patients from city centers, diagnostic distributions at their application were as follows: late stage 8% (n = 11), local advanced stage 60% (n = 79), and local stage 32% (n = 42). Diagnostic distributions of the cases who could not read and write, during their application were as follows: late stage 12.7% (n = 9), local advanced stage 67.6% (n = 54), and localized stage 19.7% (n = 16); these distributions for the patients that took at least elementary education, were as follows: late stage 8.1% (n = 7), stage 57.6% (n = 53), and local stage 34.3% (n = 32). Patients from rural areas, and those who have low educational status, attend the hospital at later stages of the disease, and this fact negatively affected their survival.

Factors that were determined to affect prognosis by using univariate analysis: age (for median OS <60 21.5 months; for >60 months 9.2; p = 0.003), ECOG performance status (median OS for PS 0–1 16.1 months, for PS > 1 10.1 months, p = 0.002), stage (median OS in local stage 29.8 months, in local late stage 12.3 months, in late stage 9 months, p = 0.004), and tumor localization (median OS in nasopharynx Ca 29.8 months, in non-nasopharynx Ca 11.3 months, p = 0.015). Gender was not found to affect prognosis (median OS in women 46.2, in men 14.3, p = 0.237) (Table 2). Educational status (median OS in cases with at least elementary education 21.5 months, in cases that cannot read or write 10.3 months, p = 0.001), and the living environment (median OS in cases from cities 17.6 months, in cases from rural areas 9.0 months, p = 0.014) were also found to affect survival rates in patients with head and neck cancer (Figs. 1 and 2). Cases with low educational levels and those living in rural areas were found to have poorer survival expectations.

In the multivariate analysis; age (>60 vs < 60, OR: 1,94, 95% CI 1.19–3.17, p = 0.008), educational status (cases that cannot read or write vs elementary school or higher, OR: 1.64, 95% CI: 1.03–2.62, p = 0.037) and stage (early stage vs local advanced stage, OR: 3.07, 95% CI: 1.58–5.94, p = 0.01, early stage vs late stage, OR: 3.49, 95% CI: 1.52–8.03, p = 0.003) were determined to be independent prognostic factors (Table 3).

4. Discussion

Distinct socioeconomic inequality is known to exist in head and neck cancer risk. This inequality cannot be solely explained by the