

Predictors of Advanced Stage Presentation in Head and Neck Cancer Patients at Tikur Anbessa Specialized Hospital, Oncology Unit, Addis Ababa, Ethiopia

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Abstract

Background: One of the determinants of the prognosis of head and neck cancer is the stage at presentation, one third of patients with head and neck cancer are present in the early stages of disease and the rest of them come in advanced stages. Advanced stage of head and neck cancer results not only in poor survival but is also associated with more severe late effects of the disease and treatment. Therefore, this study aims to determine predictive factors of advanced stage presentation of head and neck cancer patients at Tikur Anbessa specialized hospital, Ethiopia.

Methods: A cross sectional study was conducted in patients with histologically proven head and neck cancer during March to April, 2019 at Tikur Anbessa specialized hospital, oncology center. Data were collected using patient chart review and a pretested interviewer administered questionnaire. EPI-INFO 7.2.2.6 and Stata 14.0 were used for data entry and analysis. Bivariate and multivariate logistic regressions were used to analyze the associated variables.

Results: From a 102 head and neck cancer patients 59.80% of presented with advanced stage. Male respondents (AOR=0.19; 95% CI=0.06-0.64; p=0.007), insured medical expenses (AOR=0.22; 95% CI=0.07-0.69; p=0.01) and living in Addis Ababa (AOR=0.10; 95% CI=0.03-0.33; p=0.000) decrease the odds of advanced stage presentation while substance use (AOR=3.10; 95% CI=1.01, 9.49; p=0.047) increased odds of advanced tumor stage presentation.

Conclusion and recommendation: In conclusion, head and neck cancer patients presented at advanced stage in TASH, Ethiopia. This study also declared that gender; live in out of Addis Ababa, lack of governmental health insurance and substance user are a factors of advanced stage presentation among head and neck cancer patients. Author recommends that the government could increase the accessibility of health care facilities for those out of Addis Ababa, expand health care insurance, and better to practice evidenced based intervention at the national level according to WHO recommendation.

Keywords: Head and neck cancer • Risk factors • Stage at presentation • Quality control • Nasal cavity

Abbreviations: ETB: Ethiopian Birr; HNC: Hade and Neck Cancer; MW: Mulugeta Wassie; TA: Tseganesh Asefa; TASH: Tikur Anbessa Specialized Hospital; WT: Winta Tesfaye; ZW: Zerko Wako

Introduction

The term head and neck cancer do not refer to a single entity, rather to a diverse spectrum of malignancies that arises from the epithelial lining of upper aero digestive tract. The major sites are oral cavity, pharynx, larynx, nasal cavity, and paranasal sinuses, salivary glands and skin cancer, including melanoma [1,2].

Head and neck cancer is a major global health issue with half million new cases diagnosed per year, it is the nine most common malignancy in the world. The two thirds of the global burden of head and neck cancer cases occur in developing countries. According Addis Ababa cancer registry, HNC stood first and third in male and female respectively among the six common malignancies. In addition to this, the study in university of Gondar hospital reported that HANC is one of the five commonest cancers in the male [3-5].

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Received: 16 February, 2023, Manuscript No. JIO-23-89505; **Editor assigned:** 20 February, 2023, PreQC No. JIO-23-89505 (PQ); **Reviewed:** 07 March, 2022, QC No. JIO-23-89505; **Revised:** 08 May, 2023, Manuscript No. JIO-23-89505 (R); **Published:** 16 May, 2023, DOI: 10.37421/2329-6771.2023.12.425.

One of the determinants of the prognosis of head and neck cancer is the stage at presentation, one third of patients with head and neck cancer are present in the early stages of disease (stage I or II) and the rest of them come in advanced stages (stage III, IV). Early stage cancers have a 60%–95% chance of cure from local treatment alone while advanced cancers have more than 50% chance of recurrence and distant metastases [6,7].

Advanced stage of head and neck cancer results not only in poor survival but is also associated with more severe late effects of the disease and treatment, such as dysphagia, with implications for rehabilitation and survivorship [8,9].

Many patients in Africa present late with clinically advanced tumors as a result of factors mentioned below, which result in delayed diagnosis and treatment with resultant worsening in the outcomes. Various factors have been investigated as predictors for a diagnosis of an advanced stage presentation in head and neck cancer such as gender, age, site of origin, access to care, insurance status, tobacco and alcohol consumption; poor socioeconomic status, race, periodontal disease and dietary factors [10,11]. This study aiming to determine predictive factors of advanced stage presentation in head and neck cancer patients.

Materials and Methods

Study design, period, and setting

Institutional based cross-sectional study was conducted from March to April 2019 at the oncology center, Tikur Anbessa Specialized Hospital, Ethiopia. The hospital is a teaching hospital of Addis Ababa University and a major referral center from all corners of country especially for cancer patients. The hospital is the only oncology center in the nation providing radiation therapy during the study period [12].

Inclusion and exclusion criteria

Patients who are ≥ 18 years, with a histologically confirmed diagnosis of head and neck cancer at the time of data collection included in this study. Patients who had HNC cancer disseminated from another site were excluded.

Sample size determination and sampling procedure

To determine the sample size a single population proportion formula was used.

$n = (Z/2)^2 P(1-P)/d^2$, since there was no prior study, taking 50% expected prevalence and used 95% confidence level (1.96). $n = (1.96)^2 0.5(1-0.5)/(0.05)^2 = 384$.

Where,

n =Required sample size;

z =Critical value at 95% CI;

p =Prevalence rate;

d =Margin of error to be 5%

Since the study population less than 10,000, the finite correction formulas were used to calculate the final sample size (N_f).

Thus, $N_f = n/1 + n/N$

Where,

N_f =Desired sample size;

n =The calculated sample size;

N =Total population;

$N_f = (n/(N+n))/N = (384/(384+134))/134 = 99$.

After adding 10% contingency, the total sample size was 109 head and neck cancer patients.

According to the one year record of head and neck cancer, 1608 cases were seen in the oncology unit at Tikur Anbessa specialized hospital. Since the duration of the study was four weeks, the calculated flow within four weeks was 134 and the required sample size was 109. Therefore, k value was 1.22, approximately=1. Participants were selected by using systemic random sampling every other patient.

Operational definition

Early stage: Patient diagnosis in head and neck cancer stage I and II.

Advanced stage: Patient diagnosis in head and neck cancer stage II and IV.

Stage at diagnosis: Clinical stage was defined according to the AJCC staging system 7th edition, with stage I-II defined as early stage and II-IV as advanced stage [13].

Substance use: Patients who used one, two or all of three substances (cigarette, chat and alcohol).

Medical expenses: Modality of payment coverage or costs for hospital visits and prescriptions [14].

Data collection tools

A structured questionnaire was prepared from reviewing different literatures to collect data by interview guided and information from patient medical records. The questionnaire were developed in english and translated into amharic version for better understanding by patients. The translated amharic version was translated back to english to ensure consistency.

Patient charts review guide was used to identify diagnosis of head and neck cancer and to extract other clinical characteristics such as, stage at presentation, primary cancer site, and type of carcinoma. The interview guided questionnaire was also used to collect information on patients' socio-demographics such as gender, age, marital status, level of education, occupation, modality of payment coverage for medical expenses, place of residence, and substance use habit.

Data quality control

To control the data quality, two day training was provided for the supervisor and the three data collectors. The questionnaire was pre tested and modifications were made to fit our set up based on the pretest result. The collected data were checked on daily basis for

completeness and cleaned manually and double data entry was performed to check clarity.

Data processing and analysis

Firstly, data were checked for completeness and consistencies. The collected data was entered into EPI-INFO version 7.2.2.6 then exported to stata version 14.0 for analysis. The data was analyzed descriptively and Shapiro-Wilk test (p-value=0.99875) were used to determine the normality of the data.

Binary logistic regression analysis was applied. The multivariable logistic regression analysis was done for variables with a p-value less than 0.2 in the bi-variable analysis. Those variables with p value, 0.05 were claimed as significant associated factors of advanced stage presentation of head and neck cancer patients.

The mean age of respondents was 42.5 with standard deviation of ± 14.08 years and a minimum and maximum range from 18 to 76. More than half 55 (53.92 %) of the respondents were currently married. In regards to participant's education, 52 (50.98%) of the respondents didn't attended formal education while the rest 50 (49.02 %) had completed some level of formal education.

By occupation, thirty seven (36.27%) of respondents were unemployed like house wife or student. Forty six (45.10%) of respondents were insured (their medical expenses covered by government). Forty three (42.16%) of the participants came from regions other than Addis Ababa. Nearly half (53.92%) of participants were substance user. The most prevalent primary tumor site was nasal cavity/ nasopharyngeal that accounted about 42%. The common type of carcinoma was squamous cell carcinoma which accounts 62.70% (Table 1).

Results

Socio-demographic and clinical characteristics of study participants

Overall, 102 respondents were surveyed in this study giving response rate 93.6 %. From the respondents 55 (53.92%) were male.

Characteristics		Frequency	Percent %
Gender	Male	55	53.92
	Female	47	46.08
Age	18 to 45 years	56	54.9
	Above 45 years Mean \pm SD => 42.58 \pm 14.08	46	45.1
Marital status	Unmarried	47	46.08
	Married	55	53.92
Level of Education	No formal education	52	50.98
	Formal education	50	49.02
Occupation	Employed	65	63.73
	Unemployed	37	36.27
Medical expenses	Insured	46	45.1
	Uninsured	56	54.9
Place of resident	Addis Ababa	59	57.84
	Regions other than Addis Ababa	43	42.16
Substance use	User	55	53.92
	None user	47	46.08
Primary tumor site	Oral cavity/oropharyngeal	37	36.27
	Nasal cavity/nasopharyngeal	43	42.16
	Larynx/hpopharyngeal	22	21.57
Type of carcinoma	Squamous cell carcinoma	64	62.75
	Adenocarcinoma	23	22.55
	Other	15	14.71

Table 1. Socio demographic and clinical characteristics of study participants in Tikur Anbessa specialized hospital, oncology center, Addis Ababa, Ethiopia, 2019 (n=102).

Prevalence of advanced stage presentation among head and neck cancer patients

The overall prevalence of advanced stage presentation among patients with head and neck cancer was 59.8% (95% CI (0.49, 0.69)) (Figure 1). It was higher (59.02%) among female patients, 54.10% among patients whose age groups of 18-45 years. About 60% of married and nearly three fourth (77%) of patients living in Addis Ababa presented with advanced stage. More than half (55.74%) of educated and employed respondents presented in advanced stage.

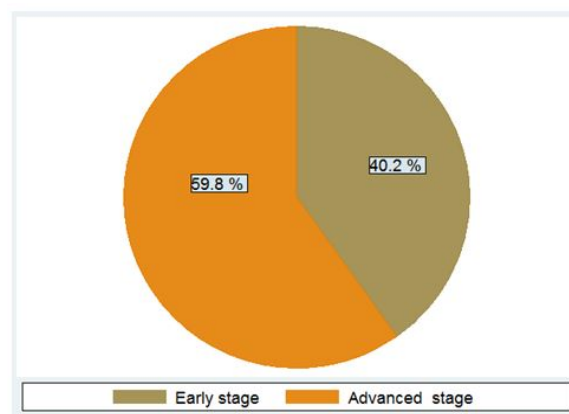


Figure 1. Prevalence of advanced stage presentation of head and neck cancer patients in Tikur Anbessa specialized hospital, oncology center, Addis Ababa, Ethiopia, 2019 (n=102).

Closely half (50.82%) patients with nasal cavity/ nasopharyngeal tumor and those insured in their payment coverage (57.38%) presented with advanced stage in the current study (Table 2).

Characteristics		Stage	
		Early N (%)	Advanced N (%)
Gender	Male	30 (73.17)	25 (40.98)
	Female	11 (26.83)	36 (59.02)
Age	18 to 45 years	23 (56.10)	33 (54.10)
	Above 45 years	18 (43.90)	28 (45.90)
Marital status	Unmarried	24 (58.54)	23 (37.70)
	Married	17 (41.46)	38 (62.30)
Level of education	No formal education	25 (60.98)	27 (44.26)
	Formal education	16 (39.02)	34 (55.74)
Occupation	Employed	31 (75.61)	34 (55.74)
	Unemployed	10 (24.39)	27 (44.26)
Medical expenses	Insured	11 (26.83)	35 (57.38)
	Uninsured	30 (73.17)	26 (42.62)
Place of resident	Addis Ababa	12 (29.27)	47 (77.05)
	Regions other than Addis Ababa	29 (70.73)	14 (22.95)
Substance use	User	32 (78.05)	23 (37.70)
	None user	9 (21.95)	38 (62.30)

Primary tumor site	Oral cavity/oropharyngeal	22 (53.66)	15 (24.59)
	Nasal cavity/nasopharyngeal	12 (29.27)	31 (50.82)
	Larynx/hpopharyngeal	7(17.07)	15 (24.59)
Type of carcinoma	Squamous cell carcinoma	27 (65.85)	37 (60.66)
	Adenocarcinoma	7 (17.07)	16 (26.23)
	Other	7 (17.07)	8 (13.11)

Table 2. Prevalence of advanced stage presentation among head and neck cancer patients in Tikur Anbessa specialized hospital, oncology center, Addis Ababa, Ethiopia, 2019 (n=102).

Predictors of advanced stage presentation in head and neck cancer patients

In the bi-variable logistic regression analysis, gender, marital status, level of education, occupation, medical expenses, place of residences and substance use were significantly associated with outcome variable at $p < 0.2$. All variables with $p < 0.2$ in the bi-variable analysis were included in the multivariable analysis. In multivariable analysis, four variables were found to be statically significant at the level of $p < 0.05$. Accordingly gender, medical expenses, place of residences, and substance use were demonstrated to have statically significant association with advanced stage presentation in head and neck cancer patients.

Male respondents presented in advanced stage about 81% (AOR=0.19; 95% CI=0.06- 0.64) lower than female. Likewise, participants who were insured their medical expenses presented in advanced stage about 78% (AOR=0.22; 95% CI=0.07-0.69) lower than those uninsured. Respondents living in Addis Ababa presented in advanced stage about 90% (AOR=0.10; 95% CI=0.03-0.33) lower than those who came outside Addis Ababa. Finally, Substance users presented with advanced stage about three times (AOR=3.10; 95%CI=1.01, 9.49) more than non-users (Table 3).

Variables	Stage		COR (95% CI)	P-value	AOR (95% CI)	P-value
	Early N (%)	Advanced N (%)				
Gender						
Male	30 (73.17)	25 (40.98)	0.25 (0.11, 0.60)	0.002	0.19 (0.06, 0.64)	0.007*
Female	11 (26.83)	36 (59.02)	1		1	
Marital status						
Unmarried	24 (58.54)	23 (37.70)	0.43 (0.19, 0.96)	0.04	2.62 (0.85, 8.06)	0.092
Married	17 (41.46)	38 (62.30)	1		1	
Level of education						
No formal education	25 (60.98)	27 (44.26)	0.51 (0.23, 1.14)	0.1	2.41 (0.79, 7.33)	0.123
Formal education	16 (39.02)	34 (55.74)	1		1	
Occupation						
Employed	31 (75.61)	34 (55.74)	0.41 (0.17, 0.97)	0.043	0.89 (0.26, 2.84)	0.803
Unemployed	10 (24.39)	27 (44.26)	1		1	
Medical expenses						
Insured	11 (26.83)	35 (57.38)	3.67 (1.56, 8.65)	0.003	0.22 (0.07, 0.69)	0.010*
Uninsured	30 (73.17)	26 (42.62)	1		1	
Place of residences						
Addis Ababa	12 (29.27)	47 (77.05)	8.11 (3.30, 19.9)	0	0.10 (0.03, 0.33)	0.000*
Regions other than Addis Ababa	29 (70.73)	14 (22.95)				
Substance use						
User	32 (78.05)	23 (37.70)	0.17 (0.07, 0.42)	0	3.10 (1.01, 9.49)	0.047*

None user	9 (21.95)	38 (62.30)	1	1
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CI: Confidence Interval, *significant at p-value less than 0.05

Table 3. Factors of advanced stage presentation of head and neck cancer patients in Tikur Anbessa specialized hospital, oncology center, Addis Ababa, Ethiopia, 2019.

Discussion

The current study aimed to identify factors of advanced stage presentation among head and neck cancer patients. In this study about 60% of participants presented with advanced stage. The current prevalence is in line with the study conducted in Denmark, and USA with prevalence of 58%, and 61% respectively [15,16]. On the other hand, the result of this study is lower than the studies conducted in India, Tanzania and Kenya with a higher prevalence 88.1%, 95.9% and 70% respectively [17,18]. This might be due to variations in study design, sample size, sociocultural status of study participants, and health care delivery policy of each country.

Male patients presented with advanced stage nearly 81% lower than female patients. This could be due to the fact that life style factors such as use of cigarette, chat and alcohol have been associated with the occurrence of head and neck cancer which could explain the notable sign and symptoms of earlier stage at a diagnosis [19]. This result is in contrast with the study done in India, Canada and Nigeria [20]. The difference might be sociocultural status of the study participants, attitude towards screening and willingness to bring symptoms to medical attention.

Participants living in Addis Ababa presented with advanced stage about 90% lower than those who live outside Addis Ababa. This finding is supported by the study conducted in TASH, and Greece. This might be respondents came from out of Addis Ababa need additional expenses for traveling, the need for somebody to accompany them and the need to stay in a new environment during the treatment period.

The current study revealed that participants who were insured presented with advanced stage about 78% lower than those uninsured. This is in agreement with the studies conducted in USA, US, France and Pennsylvania. This might be related to high healthcare costs, financial stress related to transportation, and inability or leave work.

Insurance and cost related barriers to care were a critical playing field that ensure patients to access a high quality care and early detection.

Another established risk factor was substance use. Substance users in the current study presented with advanced stage about three times more than non-users. This is inconsistent with the studies done in Nigeria, British Colombia and South Africans. This might be due to substance users could encounter other concurrent infections that mask the sign and symptoms of cancer.

Conclusion

In conclusion, more than half head and neck cancer patients presented in advanced stage in TASH, Ethiopia. This study also declared that gender; live in out of Addis Ababa, lack of governmental health insurance and substance user are a factors of advanced stage presentation among head and neck cancer patients. Author recommends that the government could increase the accessibility of health care facilities for those out of Addis Ababa, expand health care insurance, and better to practice evidenced based intervention at the national level according to WHO recommendation.

Ethical Approval and Consent to Participants

Ethical clearance was obtained from Institutional Review Board (IRB) of Addis Ababa university, collage of health science, school of nursing and midwifery with protocol number of 011/19/SNM. A support letter was obtained from cancer center of Tikur Anbessa specialized hospital to conduct the data collection. Additionally, an informed consent was obtained from each participant after providing sufficient information.

Consent for Publication

Not applicable.

Availability of Data and Materials

The datasets used in this study are available upon request of author.

Funding

The author was not funded for this work.

Acknowledgements

My heartfelt gratitude was going to Addis Ababa university for providing ethical clearances. Also, I would like to acknowledge the patients who respond questions, hospital director and data collectors for their support during data collection.

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How to cite this article: Asefa, Tseganesh. "Predictors of Advanced Stage Presentation in Head and Neck Cancer Patients at Tikur Anbessa Specialized Hospital, Oncology Unit, Addis Ababa, Ethiopia." *J Integr Oncol* 12 (2023): 425.