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Original Article

Sociodemographic Features of Cancer Patients Registered at a Single Rural Cancer Hospital in Western India

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Abstract

Aim: The aim of the study was to know the sociodemographic features of cancer patients registered at a rural cancer hospital in Western India. **Materials and Methods:** The demographic and clinical data were extracted from the medical records of the newly registered patients at the cancer center in the calendar year 2018. **Results:** A total of 2813 new patients were registered who were confirmed to have a malignancy. The median age was 59 years for males and 55 years for females. Mouth, tongue, esophagus, hypopharynx, and lung were the leading five sites in men, whereas breast, cervix, ovary, mouth, and esophagus were the leading five sites in women. The proportion of cancer patients above the age of 65 years at the center was more than the other neighboring hospital-based cancer registries. The proportion of tobacco consumption in female patients was found to be higher.

Keywords: *Cancer, demography, hospital-based cancer registry, rural India*

Introduction

Cancer is the second leading cause of death worldwide.[1] Cancer burden in India varies substantially across the length and breadth of the country. The two popular cancer registries in India are Population-Based Cancer Registries (PBCR) and Hospital-Based Cancer Registries (HBCR). The Global Burden of Diseases, Injuries, and Risk Factors Study 2016 estimated that the incidence of cancer in India has increased from 548,000 in 1990 to 1,069,000 in 2016, and the crude cancer incidence rate in India has increased from 63.4 / 100,000 in 1990 to 81.2 / 100,000 in 2016.[2] Here, we present the data from Kolhapur Cancer Centre (KCC) which is a comprehensive cancer center from the western part of India situated at the border of Maharashtra, Karnataka, and Goa states. The aim of the study was to find the sociodemographic pattern of the patients coming to our center to formulate the strategies for the management. It gave us an estimate of the number of cancer patients and leading sites of cancer cases attending the cancer center. We also compared our data with the data published from the neighboring HBCRs, namely Tata Memorial Hospital (TMH), Mumbai; Kidwai Memorial Institute of Oncology (KMIO), Bengaluru; and Rashtra Sant Tukadoji (RST) Regional Cancer Hospital, Nagpur, and one rural PBCR, i.e., Barshi, Maharashtra, situated approximately 400 km, 600 km, 850 km, and 250 km north, south, east, and north-east of the present study center, respectively.[3,4]

Materials and Methods

This was a retrospective study carried out at KCC, India. After ethics committee approval, all the cancer patients registered at the center from January 1, 2018, to December 31, 2018, were included in the study. The demographic and clinical data were extracted from the medical records in the patient files and electronic database of these patients.

Statistical analysis

The data were collected, compiled, and summarized using percentages and proportions using IBM SPSS Statistics for Windows, version 21 (IBM Corp., Armonk, NY, USA).

Results

The total number of new patients registered in the year 2018 was 3658. The medical records of 3534 patients could be retrieved. The total number of histologically proven cancer

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patients was 2813 (79.6%). On an average, 234 new cancer patients were registered in each month. Nearly 80% of the patients were from the state of Maharashtra and the rest were from neighboring states. The state-, district-, and taluka-wise distribution is shown in Tables 1-3.

The proportion of male patients was 51.1%, with a median age of 59 years (range 4 months–100 years), whereas 48.9% of patients were female with a median age of 55 years (range 3 months–98 years). The proportion of cancer patients by broad age groups, namely 0–14, 15–34, 35–64, and 65+ years, is shown in Figure 1 and Table 4. The top ten leading sites in males and females at our center are shown in comparison with the neighboring HBCRs in Figures 2, 3 and Tables 5-8. The leading sites according to broad age groups are displayed in Figures 4-11 and Tables 9-16. The incidence of tobacco addiction was 67% in males and 23% in females, whereas the incidence of alcohol addiction was 23% in males and <1% in female patients. The leading cancer sites in tobacco users are displayed in Figures 12, 13 and Tables 17-19. The proportion of the cancer patients with age between 0 and 14 years at KCC was 1.3% as compared to the other center ranging from 4% to 5%. The proportion of cancer patients above the age of 65 years at KCC was 37.1% and 29.0% in males and females, respectively, which is more than the other center, which ranges from 13.7% to 25%. We could retrieve the stage at presentation for

Table 1: State-wise distribution of patients

State	Number of patients (%)
Maharashtra	2248 (79.9)
Karnataka	543 (19.3)
Others	22 (0.8)
Total	2813 (100)

Table 2: District-wise distribution of patients

District	Number of patients (%)
Kolhapur	1569 (55.9)
Belgaum	492 (17.5)
Sangli	309 (11)
Satara	117 (4.1)
Sindhudurg	108 (3.8)
Others	218 (7.7)
Total	2813 (100)

Table 3: Taluka-wise distribution of patients in Kolhapur District

Talukas in Kolhapur district	Number of patients (%)
Karvir	451 (28.7)
Hatkanangale	342 (21.8)
Kagal	151 (9.6)
Gadhinglaj	111 (7.1)
Shirol	97 (6.2)
Panhala	87 (5.5)
Chandgad	80 (5.1)
Radhanagari	68 (4.3)
Bhudargad	63 (4)
Shahuwadi	60 (3.8)
Ajara	50 (3.2)
Gaganbawda	9 (0.6)
Total	1569 (100)

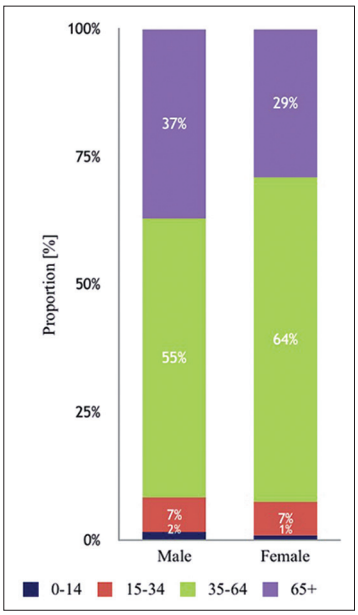

Figure 1: Stack diagram showing proportion of cancers by broad age

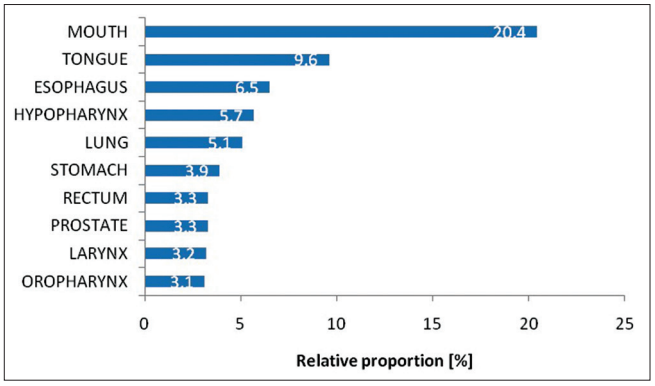

Figure 2: Top ten leading sites of cancer in males

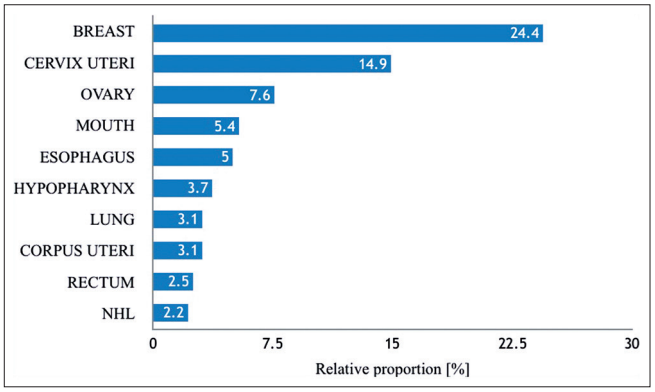

Figure 3: Top ten leading sites of cancer in females

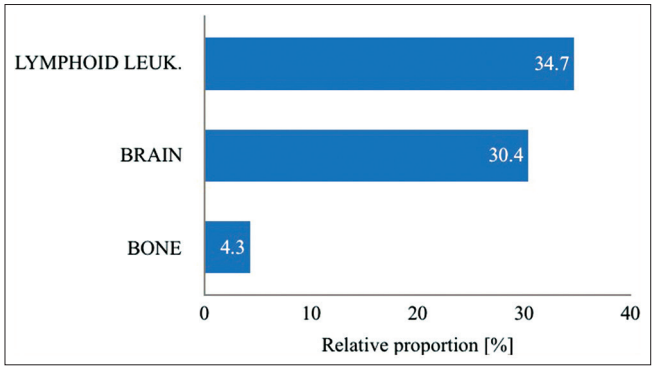

Figure 4: Leading sites in broad age group (0–14 years) – male

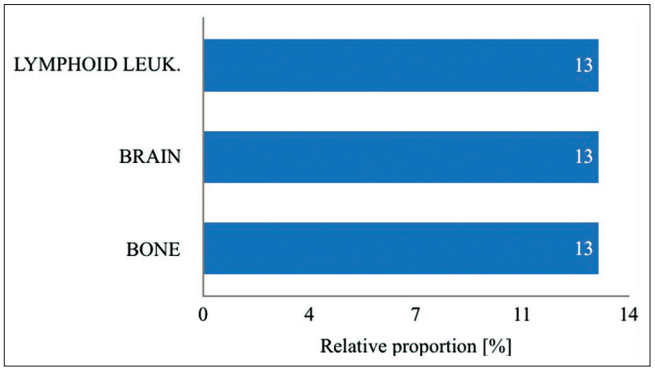

Figure 5: Leading sites in broad age group (0–14 years) – female

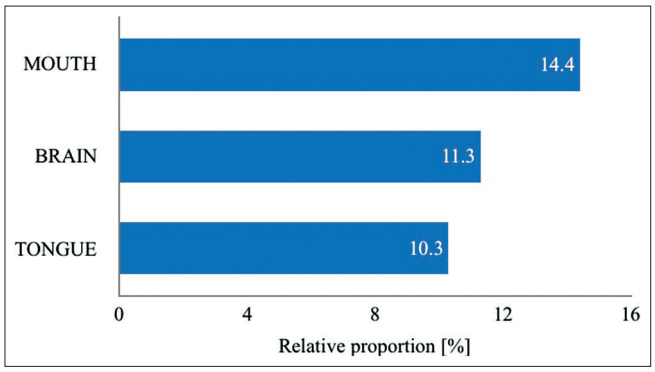

Figure 6: Leading sites in broad age group (15–34 years) – male

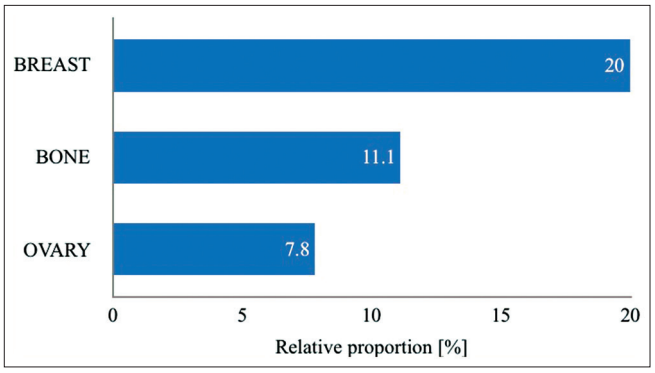

Figure 7: Leading sites in broad age group (15–34 years) – female

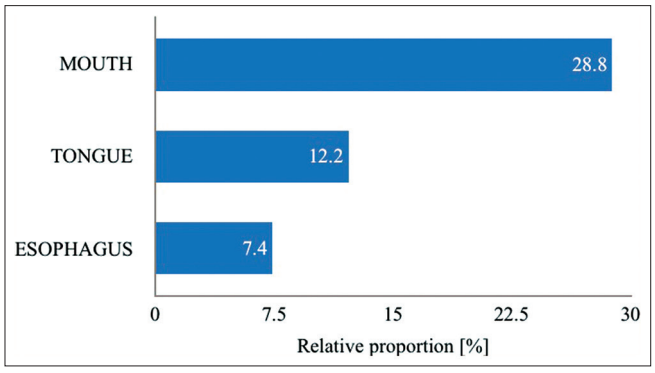

Figure 8: Leading sites in broad age group (35–64 years) – male

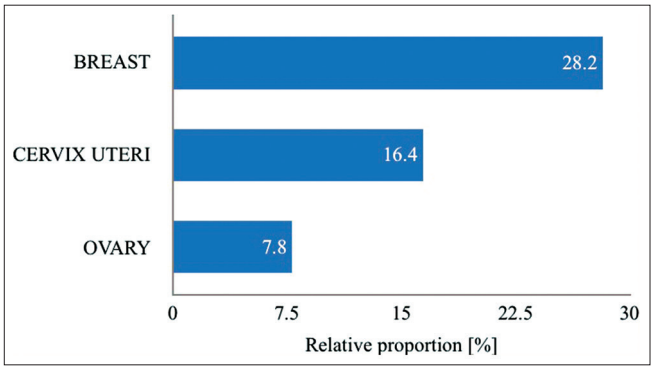

Figure 9: Leading sites in broad age group (35–64 years) – female

Table 4: Number (#) and proportion (%) of cancers by broad age groups

Gender	Age, *n* (%)				Total
	0-14	15-34	35-64	65+	
Male	23 (1.6)	97 (6.7)	784 (54.6)	534 (37.1)	1438
Female	13 (0.9)	90 (6.5)	873 (63.4)	399 (29.0)	1375
Total	36 (1.3)	166 (5.9)	1678 (59.6)	933 (33.2)	2813

82.5% of the patients, and we found that two out of three patients presented in either Stage III or Stage IV [Figure 14 and Table 20]. Nearly 75% of the patients diagnosed with cancer received at least one modality of treatment, i.e.,

Table 5: Top ten leading sites of cancer in males

Site	*n* (%)
Mouth	294 (20.4)
Tongue	139 (9.6)
Esophagus	94 (6.5)
Hypopharynx	82 (5.7)
Lung	73 (5.1)
Stomach	57 (3.9)
Prostate	48 (3.3)
Rectum	47 (3.3)
Larynx	46 (3.2)
Oropharynx	45 (3.1)

n – Absolute number, % - Proportion

surgery, chemotherapy, or radiation therapy. A vast majority of the patients (more than 90%) were low-economic class, and hence, received the cancer treatment under government schemes.

Discussion

Cancer registration helps us to know the cancer burden seen at a particular hospital, which reflects the population burden catered by the hospital. To our knowledge, this is the first report of a hospital-based cancer patient data registered at a rural nonacademic cancer center in the western part of India bordering the states of Maharashtra, Karnataka, and Goa. The leading sites of cancers in males are all tobacco related, namely mouth, tongue, esophagus, hypopharynx, and lung. The leading sites of cancers in females are breast, cervix, ovary, mouth, and esophagus. This pattern matches with the neighboring HBCRs. Needless to say, tobacco is the leading cause of majority of the cancer burden at this center. The proportion of tobacco consumption in female patients was found to be higher than that in another study.[5] Mouth cancer proportion in male patients is found to be 20.4% at KCC, which is more than TMH (14.0%), Barshi (8.6%), KMIO (7.6%), and similar to RST (20.9%), whereas the proportion of lung cancer in male patients is found to be 5.1% at KCC, which is less than TMH (7.9%),

Table 6: Top ten leading sites of cancer in females

Site	*n* (%)
Breast	335 (24.4)
Cervix uteri	205 (14.9)
Ovary	104 (7.6)
Mouth	74 (5.4)
Esophagus	69 (5.0)
Hypopharynx	51 (3.7)
Lung	43 (3.1)
Corpus uteri	42 (3.1)
Rectum	34 (2.5)
NHL	30 (2.2)

n – Absolute number, % - Proportion; NHL – Non-Hodgkin's lymphoma

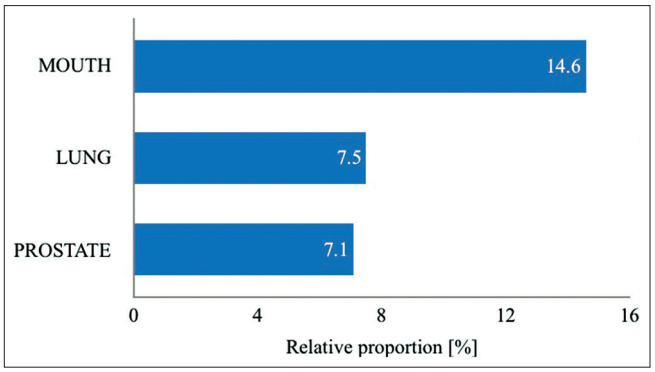

Figure 10: Leading sites in broad age group (65+ years) – male

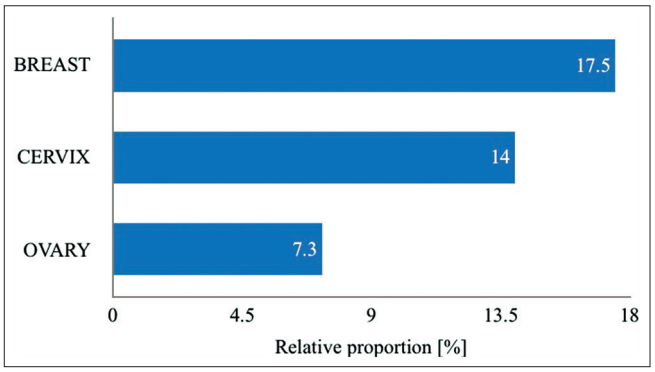

Figure 11: Leading sites in broad age group (65+ years) – female

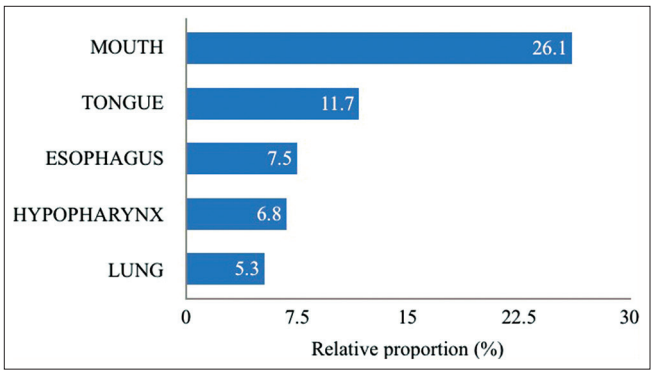

Figure 12: Top five cancer sites in male with addiction of tobacco and/or alcohol

Table 7: Top ten sites of cancer in male comparison with neighboring cancer registries

KCC (%)	TMH (%)	KMIO (%)	RST (%)	Barshi (PBCR) (%)
Mouth (20.4)	Mouth (14.0)	Esophagus (7.6)	Mouth (20.9)	Mouth (8.6)
Tongue (9.6)	Lung (7.9)	Lung (7.6)	Tongue (9.6)	Esophagus (7.7)
Esophagus (6.5)	Tongue (7.4)	Hypopharynx (7.4)	Lung (8.7)	Liver (6.2)
Hypopharynx (5.7)	NHL (5.1)	Tongue (7.1)	Esophagus (8.1)	Rectum (4.4)
Lung (5.1)	Myeloid leukemia (3.8)	Stomach (7.0)	Larynx (5.4)	Tongue (4.4)
Stomach (3.9)	Esophagus (3.6)	Mouth (6.7)	Brain (3.4)	NHL (4.4)
Rectum (3.3)	Stomach (3.6)	Brain (4.9)	Pharynx (2.9)	Prostate (4.4)
Prostate (3.3)	Lymph leukemia (3.4)	Larynx (4.6)	Rectum (2.9)	Larynx (4.2)
Larynx (3.2)	Larynx (3.1)	Myeloid leukemia (3.5)	Myeloid leukemia (2.5)	Stomach (4.2)
Oropharynx (3.1)	Prostate (3.1)	NHL (3.3)	NHL (2.4)	Hypopharynx (4.2)

KMIO – Kidwai Memorial Institute of Oncology; TMH – Tata Memorial Hospital; KCC – Kolhapur Cancer Centre; PBCR – Population-Based Cancer Registries; RST – Rashtra Sant Tukadoji; NHL – Non-Hodgkin's lymphoma

Table 8: Top ten sites of cancer in female comparison with neighboring cancer registries

KCC (%)	TMH (%)	KMIO (%)	RST (%)	Barshi (%)
Breast (24.4)	Breast (27.6)	Cervix uteri (29.4)	Cervix uteri (24.9)	Cervix uteri (26.7)
Cervix uteri (14.9)	Cervix uteri (11.2)	Breast (14.2)	Breast (23.4)	Breast (20)
Ovary (7.6)	Ovary (5.5)	Mouth (9.9)	Mouth (8.1)	Ovary (4.6)
Mouth (5.4)	Gall bladder (5.3)	Ovary (5.1)	Esophagus (4.9)	Esophagus (3.8)
Esophagus (5.0)	Mouth (4.4)	Esophagus (4.7)	Ovary (4.3)	Lung (3.6)
Hypopharynx (3.7)	Thyroid (3.6)	Thyroid (3.8)	Tongue (3.4)	Skin (3.2)
Lung (3.1)	Lung (3.1)	Stomach (2.9)	Lung (3.0)	Rectum (2.1)
Corpus uteri (3.1)	Myeloid leukemia (2.7)	Corpus uteri (2.4)	Corpus uteri (2.8)	Mouth (2.1)
Rectum (2.5)	NHL (2.6)	Brain (2.2)	Rectum (2.0)	Thyroid (2.1)
NHL (2.2)	Esophagus (2.6)	Myeloid leukemia (1.9)	Bone (1.9)	Brain (1.9)

KMIO – Kidwai Memorial Institute of Oncology; TMH – Tata Memorial Hospital; KCC – Kolhapur Cancer Centre; RST – Rashtra Sant Tukadoji; NHL – Non-Hodgkin's lymphoma

Table 9: Leading sites in broad age groups (0-14 years) - male

Site	*n* (%)
Lymphoid leukemia	8 (34.7)
Brain	7 (30.4)
Bone	1 (4.3)

Table 10: Leading sites in broad age group (0-14 years) - female

Site	*n* (%)
Lymphoid leukemia	3 (13)
Brain	3 (13)
Bone	3 (13)

Table 11: Leading sites in broad age group (15-34 years) - male

Site	*n* (%)
Mouth	14 (14.4)
Brain	11 (11.3)
Tongue	10 (10.3)

Table 12: Leading sites in broad age group (15-34 years) - female

Site	*n* (%)
Breast	18 (20.0)
Bone	10 (11.1)
Ovary	7 (7.8)

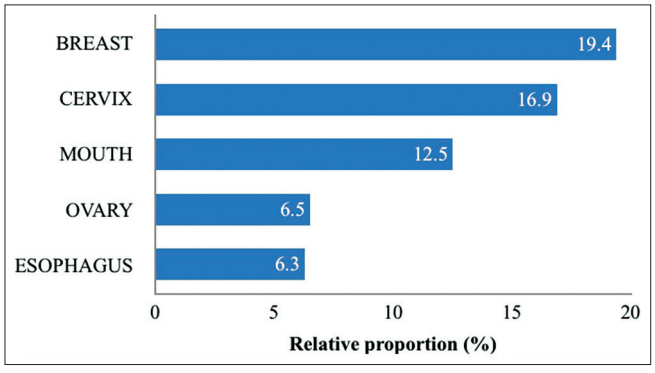

Figure 13: Top five cancer sites in female with addiction of tobacco and/or alcohol

Table 13: Leading sites in broad age group (35-64 years) - male

Site	*n* (%)
Mouth	226 (28.8)
Tongue	96 (12.2)
Esophagus	56 (7.4)

Table 14: Leading sites in broad age group (35-64 years) - female

Site	*n* (%)
Breast	246 (28.2)
Cervix uteri	143 (16.4)
Ovary	68 (7.8)

Table 15: Leading sites in broad age group (65+ years) - male

Site	*n* (%)
Mouth	78 (14.6)
Lung	40 (7.5)
Prostate	38 (7.1)

Table 16: Leading sites in broad age group (65+ years) - female

Site	*n* (%)
Breast	70 (17.5)
Cervix	56 (14.0)
Ovary	29 (7.3)

KMIO (7.6%), and RST (8.7%). More prevalence of smokeless tobacco with alcohol consumption than smoked tobacco could be the reason for this. The leading sites of cancer in female patients match with the other centers. This study gave us an insight into the leading sites of cancer in our region and the need to formulate the strategies to cater these patients without significant loss to follow-up.

Limitations

As the study was done for 12 months, the exact pattern of cancer prevalent in the region could not be estimated.

Table 17: Addictions

	Tobacco (%)			Alcohol (%)		
	Yes	No	Unknown	Yes	No	Unknown
Male	963 (67.0)	319 (22.2)	156 (10.8)	337 (23.4)	945 (65.8)	156 (10.8)
Female	447 (32.5)	721 (52.4)	207 (15.1)	3 (0.2)	1165 (84.7)	207 (15.1)
Both genders	1410 (50.1)	1040 (37.0)	363 (12.9)	340 (12.1)	2110 (75.0)	363 (12.9)

Table 18: Top five cancer sites in male with addiction of tobacco and/or alcohol

	Total (*n*=996), *n* (%)
Mouth	260 (26.1)
Tongue	117 (11.7)
Esophagus	75 (7.5)
Hypopharynx	68 (6.8)
Lung	53 (5.3)

Table 19: Top five cancer sites in female with addiction of tobacco and/or alcohol

	Total (*n*=448), *n* (%)
Breast	87 (19.4)
Cervix	76 (16.9)
Mouth	56 (12.5)
Ovary	29 (6.5)
Esophagus	28 (6.3)

Table 20: Stage at presentation

Stage	*n* (%)
0	11 (0.4)
1	119 (4.2)
2	357 (12.7)
3	839 (29.8)
4	996 (35.4)
Unknown	491 (17.5)
Total	2813 (100)

Complete data from patients pertaining to treatment details, follow-up, and outcome could not be retrieved owing to the short study period. Further, we acknowledge the limitations of the patient data registered in a cancer hospital as it does not necessarily the true population picture.

Financial support and sponsorship

Nil.

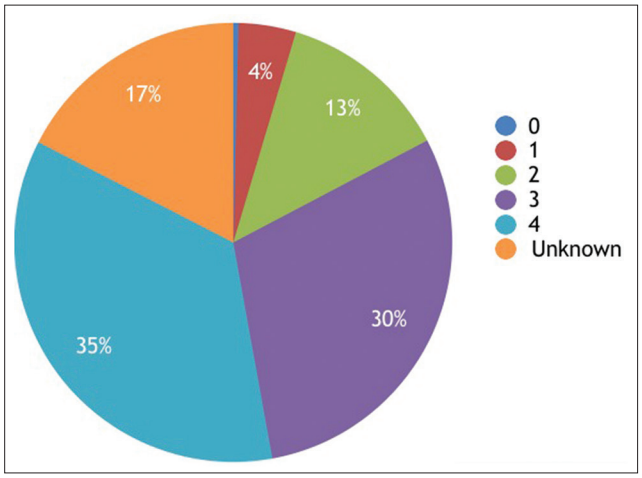

Figure 14: Stage at presentation

Conflicts of interest

There are no conflicts of interest.

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