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Head & Neck Cancer in Odisha: A five-year retrospective study at a Regional Cancer Centre

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Abstract
Background: *Head and neck cancers (HNC) constitute about one-third of all cancers in India, in contrast to 4-5% in the developed world. A hospital based five year's retrospective study was conducted to report the present burden of HNC in the state of Odisha, which has about one twenty-eighth population of India at present.*
Material and Methods: *All the patients suffering from HNC who were treated by radiation therapy during 2010-14 at a Regional Cancer Centre (RCC) in Odisha were analyzed year-wise for age, sex, site of disease and their native area.*
Results: *Basing on the census-2011 data, the number of registered HNC patients per annum in radiotherapy per million of population from low, medium and high literacy areas were calculated and found as 5.34, 6.36 and 29.51 respectively. Out of the total HNC patients treated, more than 66.49% were from oral cancer at the median age of 52 years.*
Discussion: *Odisha has 83.3% rural population with literacy below 70%. Due to large number of tobacco users, lack of awareness, higher percentage of illiteracy and unavailability of basic cancer care facilities at their reach, people mainly depend on various unscientific methods for their health care.*
Conclusion: *Strengthening of existing RCC of the state, development of oncology wings in all medical college hospitals by providing basic radiotherapy facilities, emphasising more on district cancer control programs, decent ralising of NGO schemes and facilitating with more cancer screening and awareness programs may help better registration, prevention and treatment of cancer in Odisha.*
Keywords: *Head & Neck cancer, radiotherapy, Odisha.*

Introduction

Distribution of population based cancer registries is grossly uneven, as certain important parts of the country being not represented at all and hence the current cancer burden is not reflected by registry data. South-east Asia is likely to face sharp increases of over 75% in the number of cancer deaths in 2020 as compared to 2000. [1] Head and neck cancer (HNC) is the most common malignancy seen in both the sexes across the globe, and is the commonest malignancy encountered in Indian males. It accounts for one-

fourth of male cancers and one-tenth of female cancers.[2] Excepting about 7.4% of cancer patients who are non-adicted,[3] it is mainly attributed to the habits of smoke/ smokeless tobacco, betel nut, alcohol, etc. [4] Oral cancers are the most common amongst all head and neck squamous cell cancers, which in the developing world differ from those in the western world in terms of age, sex, site of disease, etiology, and molecular biology. Poverty, illiteracy, advanced stage at presentation, lack of access to health care, and poor treatment infrastructure pose a major challenge in management of these cancers.[5,6] India is a lower-middle-income group country as classified by the World Bank. [6, 7] 90% of the oral cancer patients in rural areas belong to the lower or lower-middle socio-economic class, and 3.6% are below the poverty line. [8,9]

Although good-quality population-based cancer registries are the best indicators of the extent of the problem, hospital-based registries provide information as the outcome of a complex interaction between incidence of disease and health care-seeking behavior. [8] Hence, a hospital based five year's (2010-2014) retrospective study was planned at a Regional Cancer Centre (RCC) of Odisha with an aim to report the present burden of HNC in this state, which has more than 45.5 million of population at present. [9]

Strengthening of existing Regional Cancer Center, development of oncology wings in all medical college hospitals and district headquarter hospitals by providing basic radiotherapy facilities, emphasizing more on district cancer control programs, decentralising of NGO schemes and facilitating with more cancer screening and awareness programs may help better registration, prevention and treatment of cancer in Odisha. [10]

Material and Methods

Annual reports from 2009-10 to 2014-15 were collected from the statistical section of this hospital. Data of Census-2011[11] of India was downloaded from the website of Ministry of Home Affairs, Government of India to find out the district wise population and literacy percentage of Odisha for analysis. Out of the total 81,442 new patients attended the hospital OPD from January 2010 to December 2014, data of only 11008 (13.5%) patients who were treated by radiotherapy was extracted for this study. Among the total radiotherapy patients, 3393 (30.8%) patients were treated for HNC. Those cases were classified into six categories: (1) Oral Cavity: alveolus, angle of mouth, buccal mucosa, gingivo-buccal sulcus, palate, retromolar trigone, lip and tongue; (2) Pharynx: nasopharynx, oropharynx, hypopharynx, laryngopharynx, cricopharynx, pyariform fossa, tonsil, vallecula and base of skull; (3) Larynx: cricoid, glottis and vocal cord; (4) Paranasal sinus (PNS): maxillary sinus and parasinal region; (5) Salivary gland: parotid, submandibular and sublingual gland; and (6) Others: nasal cavity, thyroid, neck node, sinonasal, pinna and auditory canal etc. Age, sex, site of disease and native district of all the patients suffering from HNC and treated by radiotherapy in this hospital during 2010-14 were then analyzed.

Analysis

As per census-2011 data, Odisha has about one twenty-eighth population of India with male to female ratio 1000: 978. During 2001-2011, the population growth in Odisha was reported as 14.43%, while in this five year's study period (2010-14), the growth in the HNC patient attendance as registered in the Radiotherapy department of this hospital had a drastic rise of 97.5%. The female patients were only 26.3% of the total HNC patients. All the patients were in the age-range of 5-95 years, with an average of 53.1 years. Although, about 50% of HNC patients were in the age group of 41-60 years, their number was observed to be increasing with age. 66.5% of HNC patients were belonging to oral cancer followed by 12.1% pharynx, 10.7% larynx, 4% salivary gland, 2.2% PNS and 4.4% others. It was also observed that female HNC patients were very younger to the male HNC patients except in PNS and oral cancer cases. The median age of larynx

patients was 62 years, whereas that of the salivary gland cancer patients was 47 years.

Result

It is revealed from the present study that the prevalence rate of cancer is in increasing order from 2010 to 2014 [Table 1]. Out of 3393 cases included in our study, oral cavity patients (66.49%) were the maximum [Table 2]. It showed male predominance with male to female ratio as 100:36.

Table 1: Distribution of cancer patients received radiotherapy year wise.

Year	2010	2011	2012	2013	2014	Total	<Age>
Male	784	839	991	1127	1355	5096 (46.3%)	49.8
Female	919	1013	1137	1271	1572	5912 (53.7%)	49.6
Total=	1703	1852	2128	2398	2927	11008 (100%)	49.7

Table 2: HNC patients who had received radiotherapy during 2010-14

Site	Total HNC patients (2010-14)	Average patients (±SD) per annum			Sex Ratio (M : F)	Age Range	Median Age
		Male	Female	Total			
Oral Cavity	2256 (66.49%)	325±47	126±13	451±60	100:39	14-90	52
Pharynx	410 (12.08%)	64±7	18±2	82±8	100:28	5-95	55
Larynx	364 (10.73%)	64±7	8±2	73±8	100:13	23-89	62
Salivary gland	137 (4.04%)	17±1	11±1	27±2	100:63	12-88	47
Paranasal Sinus (PNS)	76 (2.24%)	10±1	5±1	15±2	100:46	9-75	45
Others	150 (4.42%)	19±4	11±2	30±5	100:55	8-85	56
Total	3393 (100%)	500±65	178±19	679±83	100:36	5-95	54

However, out of all female cancer patients the incidence of HNC patients was second to cancer cervix patients of this centre. [10] All the organs of head and neck region showed maximum involvement in the 6th decade of life, whereas the larynx showed high incidence in the 7th decade of life [Table 3]. District wise distribution of cases per million of people showed high incidence of HNC (50.62) in Cuttack district in comparison to lowest in Raygada (1.04) district [Table 4].

Table 3: Distribution of HNC patients in different age-groups

Age Group:	< 21	21-30	31-40	41-50	51-60	61-70	71-80	> 80	Total
Oral Cavity	6	78	407	599	626	375	147	18	2256
Pharynx	27	17	45	64	109	84	53	11	410
Larynx	0	3	17	54	98	123	56	13	364
Paranasal Sinus (PNS)	2	2	24	16	22	6	4	0	76
Salivary gland	4	14	28	32	27	24	7	1	137
Others	1	11	12	33	37	40	10	6	150
Total HNC	40	125	533	798	919	652	277	49	3393
Total of all cancers	494	624	1820	2812	2779	1698	665	116	11008
HNC (%)	8.10	20.03	29.29	28.38	33.07	38.40	41.65	42.24	30.82

Table 4: Distribution of HNC patients as per different literacy area

High literacy Districts	<Patients> per million per year	Medium literacy Districts	<Patients> per million per year	Low literacy Districts	<Patients> per million per year
Cuttack*	50.62	Keonjhar	11.66	Mayurbhanja	8.34
Jagatsinghpur	39.82	Angul	9.60	Malkanagiri	6.56
Kendrapara	39.02	Deogarh	9.04	Koraput	5.80
Jajpur	34.86	Ganjam$	6.86	Bolangir	5.70
Puri	30.70	Sonepur	4.92	Boudh	5.00
Dhenkanal	25.54	Sundargarh	4.12	Kalahandi	4.68
Bhadrak	24.38	Nuapara	3.60	Kandhamal	4.66
Khurdha#	22.94	Bargarh	2.98	Nabarangapur	3.78
Nayagarh	16.46	Sambalpur$	2.50	Gajapati	2.42
Balasore	12.16			Rayagada	1.04
Jharsuguda	7.94				
Total population= 17.54 million	29.51 (71.61%)	Total population= 12.74 million	6.36 (15.43%)	Total population= 11.68 million	5.34 (12.96%)

** Having two radiotherapy centres; # Having one radiotherapy centre;*
$ Having one radiotherapy department in the Medical College hospitals.

As per the census-2011 data, it was calculated and observed that there were 5.34 (12.96%) patients per million of population from the low literacy districts, 6.36 (15.43%) patients per million from the medium literacy districts and 29.51 (71.61%) patients per million of population from the high literacy districts, who had received radiation therapy in this hospital. The average age of the HNC patients from the high literacy districts was about 53 years and that in low literacy districts was about 49 years.

Discussion

According to the latest annual health survey (AHS), Odisha has highest percentage of tobacco chewers (38%) among nine surveyed states. It is ahead of Assam (36.6%), Chhattisgarh (32.5%), Jharkhand (24.1%), Bihar (22.5%), Uttar Pradesh (21%), Madhya Pradesh (18.9%), Uttarakhand (8.8%) and Rajasthan (6.9%). Among all the districts of Odisha, the number of smokeless-tobacco users is highest in Malkangiri, where 58.4% consume gutkha, khaini or paan masala, followed by Mayurbhanj (51.4%). Tobacco chewing population is more than 40% in Bolangir, Balasore, Bargarh, Bhadrak, Dhenkanal, Jajpur, Keonjhar and Koraput. [6,7,12]

Odisha has 83.3% population in rural areas with literacy rate below 70%. [11] Due to large number of tobacco users, lack of awareness, illiteracy and unavailability of basic cancer care facilities at their reach, they mainly depend on various unscientific methods for their health care. Possibly this is the reason why the registration of HNC cases is very low in those districts. Accurate registration of cancer cases from this area has also become a difficult task. This sample of patients suffered from HNC can be taken as a representative sample of the state of Odisha as majority of its patients suffering from cancer are being treated here.

Conclusion

Out of 396 radiotherapy centers (about 30 centers per 100 million of population) licensed by the Atomic Energy Regulatory Board (AERB), Government of India as on 31-May-2016 [13] for treatment of cancer, there are only five centres for 45.5 million of population of Odisha including one RCC, two radiotherapy departments in two medical colleges and two private institutes to cater the need of its own and its neighbouring areas of West Bengal, Jharkhand, Chhattisgarh and Andhra

Pradesh. This RCC being the only full-fledged cancer institute under the state Government of Odisha, bears the maximum patient load of this state because of delivering radiotherapy treatment at a very highly subsidized rate.

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