

Prevalence of Cancer in an Urban Cancer Centre in Western Odisha – A Retrospective Analysis

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Abstract:

Aim: To estimate the prevalence of cancer burden in an urban cancer centre in Western Odisha.

Material And Methods: This retrospective analysis was done in Radiotherapy Department of Veer Surendra Sai Institute of Medical Sciences (VIMSAR), Burla of Sambalpur district, Odisha, India for a three year period from 1st April 2014 to 31st March 2017. Total number of cases existing during this period was 3181.

Results: Cancer prevalence in our three year period study was 1017, 1066 and 1098 respectively during the 1st, 2nd and the 3rd year. Females were more affected in malignancies with 69.54% than males with 30.46%. The mean age of prevalence in our study period was 50.8 years. The most affected age group was 41-50 with 29.86%. Cervical cancer with 25.34% was the most common cancer followed by Carcinoma Breast with 23.51%.

Conclusion: This study of VIMSAR aims to statistically evaluate retrospectively the prevalence of different cancers and exposing higher incidences linked with appropriate aspects like geographical areas, sex and age for creating awareness and targeted solutions and calls for challenging, massive and meticulous statistical efforts.

Keywords: Cancer, Prevalence, Western Odisha

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I. Introduction

It is predicted that by the year 2030, cancer will be affecting 20 million individuals globally¹. In India, every year almost 1 million cancer cases are detected and more than half a million cancer deaths have been reported to occur². The prevalence of cancer is on the rise due to growth in size of the population, and an ageing population. Previous studies show that in India, lung and oral cancers are the commonest cancer for men³. It is a matter of concern as lung cancer is the most common cause of cancer deaths in the world. Among women, breast cancer is the principal cause of death from cancer worldwide and cervical cancer accounts for nearly 50% of all female malignancies⁴. In our country too, the scenario is similar.

Epidemiological studies undertaken previously have contributed immensely in our understanding about cancer associated risks factors and thus prevention of the cancers. The epidemiology of cancer is defined as study of the factors affecting cancer, as away to infer possible trends and causes. Murthy and Mathesis have previously described epidemiology of cancers, its control and prevention applicable to the Indian population⁵. Even though it is known that epidemiology of cancer studies could be valuable in cancer prevention yet relatively fewer epidemiological studies have so far been carried out. In this scenario, undertaking epidemiological studies such as this are imperative to attain information regarding patterns and trends which would help not only in identifying persons at high risk for the development of a particular cancer, but also various preventive and curative measures for the disease. Hence the present study was undertaken as a novel attempt to assess the prevalence of cancer in an urban cancer centre in Western Odisha.

II. Material And Methods

This retrospective observational study was carried out on patients attending Department of Radiotherapy at Veer Surendra Sai Institute of Medical Sciences (VIMSAR), Burla of Sambalpur District, Odisha from April 2014 to March 2017.

Study Design: Retrospective open label observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of Radiotherapy at Veer Surendra Sai Institute of Medical Sciences (VIMSAR), Burla of Sambalpur District, Odisha.

Study Duration: April 2014 to March 2017.

Subjects & Selection Method: Both male and female patients presenting with cancer who attended Department of Radiotherapy at VIMSAR between April 2014 to March 2017.

Procedure Methodology:

Data was collected from records and registers of Outdoor of Department of Radiotherapy, VIMSAR. Socio-demographic characteristics such as age, gender, ethnicity, nativity were noted. The type of cancer i.e., whether cancer of breast, cervix, head and neck etc with which the patient had presented was noted down. The records contained that patients registered from Sambalpur and its neighbourhood districts and states. In this paper we have tried to represent the frequency distributions of age and sex by various cancer types. Initially after finding out the incidence of various types of cancers, the prevalence of the cancers was estimated as per the following formula.

$$\text{Prevalence} = \text{incidence} \times \text{duration}$$

Thus the prevalence rates included both the older and the newer cases of cancer within in the population pool attending the Radiotherapy Department for a period of three years from 1st April 2014 to 31st March 2017. All relevant data were then entered into excel sheet, validated, summarised and analysed.

III. Result

The prevalence of cancer cases in this three year period study in number was 1017, 1066 and 1098 respectively for the 1st, 2nd and the 3rd year totalling 3181 cases. There was an increase of 4.82% in the second year and 7.96% in the third year as against the first year as shown in Fig. 1.

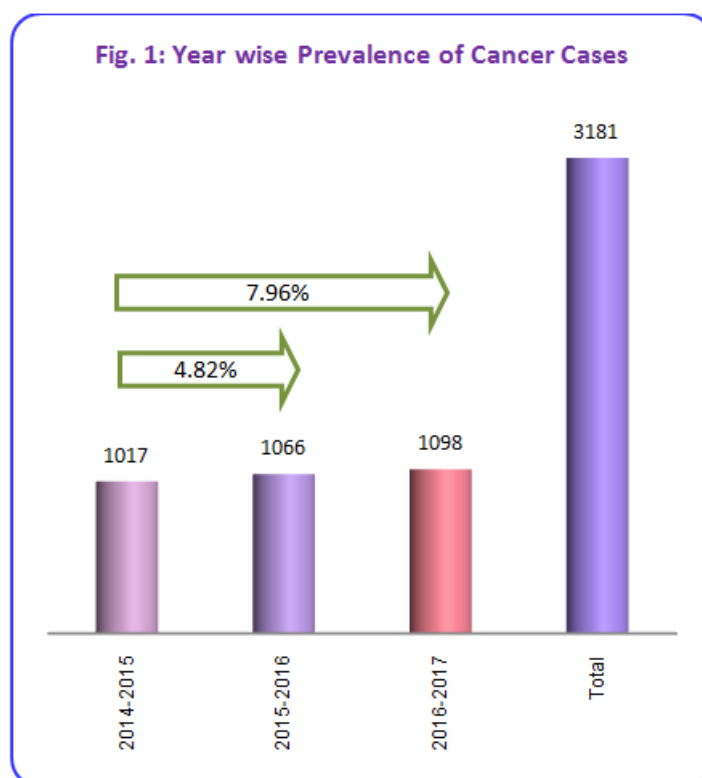
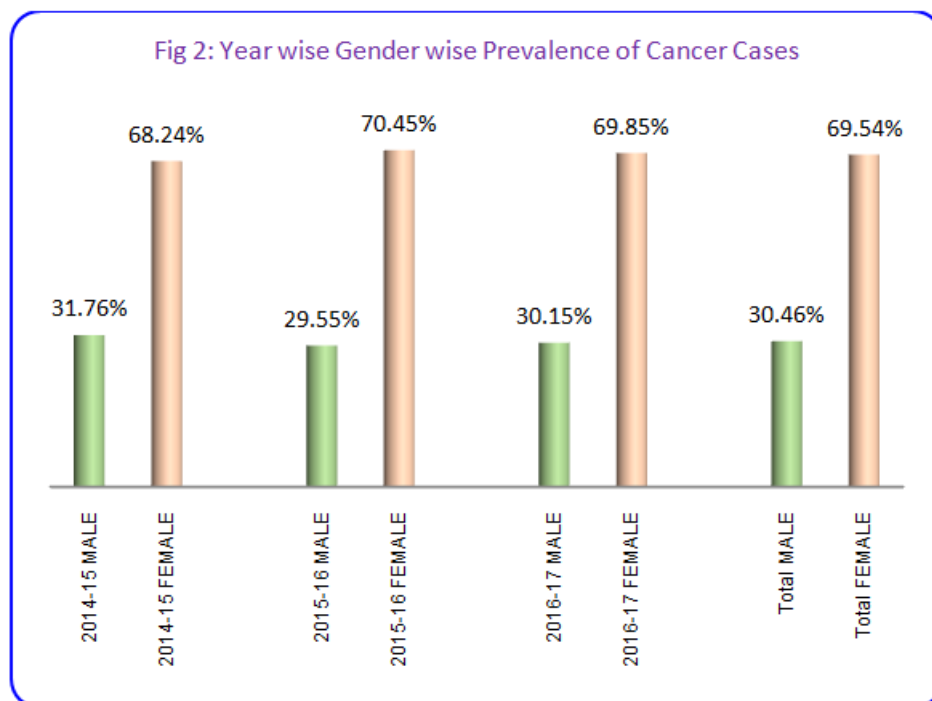
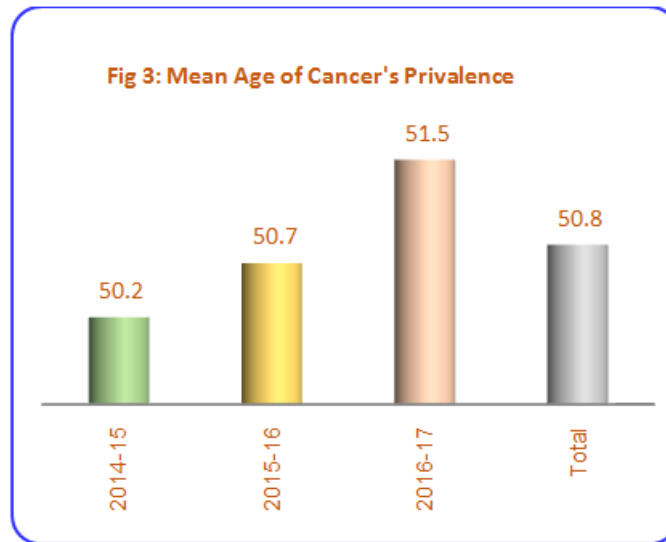


Table 1 gives year wise percentage prevalence of various types of cancer cases treated at this centre.

Sl.	Site	2014-15	2015-16	2016-17	Total
1	Cervical	27.34	25.42	23.41	25.34
2	Carcinoma Breast	21.63	24.58	24.23	23.51
3	Head & Neck	14.55	15.01	14.21	14.59
4	Stomach	6.29	6.75	6.74	6.60
5	Lung	3.54	3.47	4.10	3.71
6	Lymphoma	3.83	2.72	3.55	3.36
7	Colorectal	2.75	3.28	2.64	2.89
8	Ovarian	1.87	1.78	3.83	2.51
9	Carcinoma Gallbladder	2.46	1.69	2.09	2.07
10	Softtissue Sarcoma	2.75	2.25	1.09	2.01
11	Squamous Cell Carcinoma	2.16	0.84	1.28	1.41
12	Testicular Cancer	1.38	1.13	1.46	1.32
13	Leukemia	0.39	1.50	1.55	1.16
14	Carcinoma Penis	0.98	1.59	0.82	1.13
15	Esophageal Cancer	0.88	1.13	1.37	1.13
16	Multiple Myloma	1.28	1.22	0.82	1.10
17	Others	5.90	5.63	6.83	6.13
	Total	100.00	100.00	100.00	100.00

Females were more affected in malignancies with 69.54% than males with 30.46% as depicted in Fig 2.





As indicated by Fig 3, the mean age of prevalence in our study period has shifted marginally from 50.2 years in the first year to 50.7 years in the second year and to 51.5 years in the third year putting the overall mean age at 50.8 years.

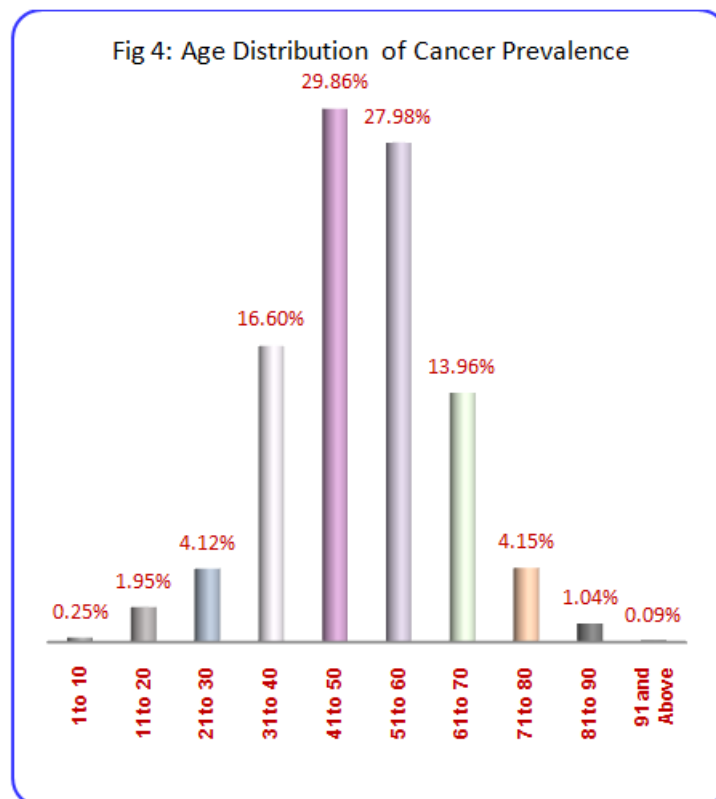
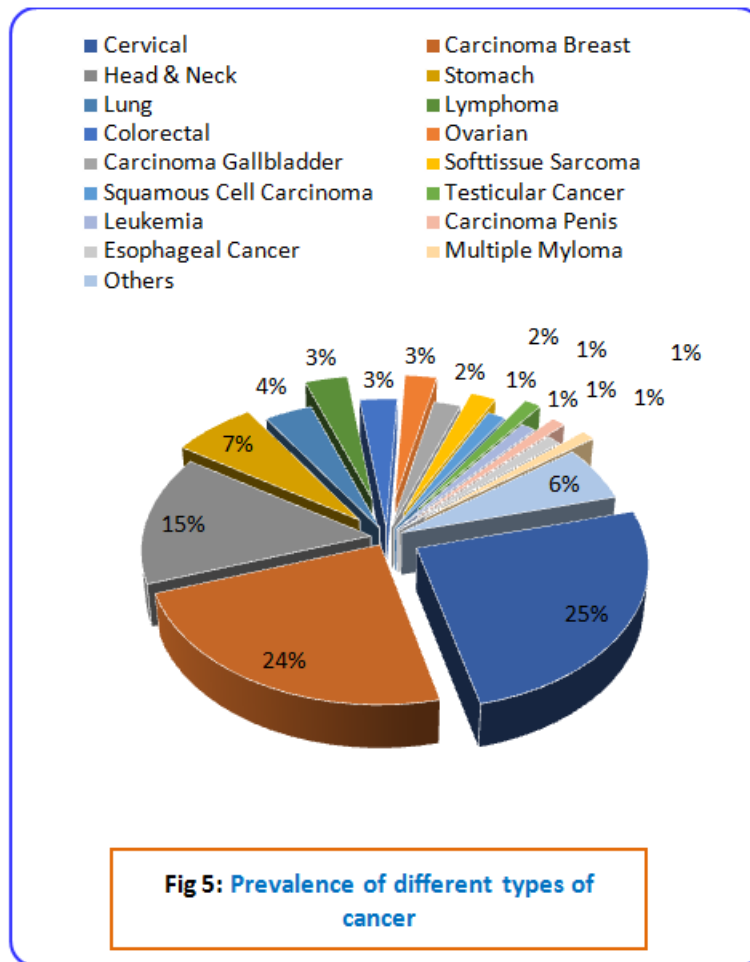


Fig 4 shows the age wise prevalence of cancer. The most affected age group was 41-50 with 29.86%. The next most affected age group was 51-60 with 27.98%.

Fig 5 indicates the prevalence of different types of cancer. Cervical cancer with 25.34% prevalence was the most common cancer followed by Carcinoma Breast with 23.51%, followed by Head and Neck with 14.59%, and Stomach with 6.60%. The least affected cancers were Carcinoma Duodenum, Mesothelioma, Unknown Primary and Mixed Mullerian Tumour of Uterus with 0.03% each.



This Department of Radiotherapy though primarily intended for the Western part of Odisha, it also serves patients from neighbouring Chhattisgarh and Jharkhand. Table 2 show the territorial prevalence of cancer. As shown, Bargarh district has the maximum prevalence with 26.34% followed by Sambalpur with 24.58% followed by Balangir with 10.81% and Sonapur with 9.68%.

Sl.	District	State	Incidence
1	Bargarh	Odisha	26.34%
2	Sambalpur	Odisha	24.58%
3	Balangir	Odisha	10.81%
4	Sonepur	Odisha	9.68%
5	Jharsuguda	Odisha	7.64%
6	Sundargarh	Odisha	5.94%
7	Deogarh	Odisha	2.96%
8	Baudh	Odisha	2.36%
9	Raigarh	Chhattisgarh	2.26%
10	Kalahandi	Odisha	2.04%
11	Nuapada	Odisha	1.54%
12	Angul	Odisha	0.85%
13	Mahasamund	Chhattisgarh	0.85%
14	Jashpur	Chhattisgarh	0.57%
15	Mayurbhanj	Odisha	0.25%
16	Ganjam	Odisha	0.22%
17	Janjgir-Champa	Chhattisgarh	0.22%
18	Balasore	Odisha	0.13%
19	Keonjhar	Odisha	0.13%
20	Khurda	Odisha	0.09%
21	Kandhamal	Odisha	0.06%
22	Nabarangpur	Odisha	0.06%
23	Gariaband	Chhattisgarh	0.06%
24	Baloda Bazar	Chhattisgarh	0.03%
25	Baramkela	Chhattisgarh	0.03%
26	Bilaspur	Chhattisgarh	0.03%
27	Raipur	Chhattisgarh	0.03%
28	Singhbhum	Jharkhand	0.03%
29	Bhadrak	Odisha	0.03%
30	Cuttack	Odisha	0.03%
31	Dhenkanal	Odisha	0.03%
32	Kendrapara	Odisha	0.03%
33	Nayagarh	Odisha	0.03%
34	Medinipur	West Bengal	0.03%

IV. Discussion

In our study, prevalence of cancer burden in was 1017, 1066 and 1098 respectively for the 1st, 2nd and the 3rd year totalling 3181 cases. Prevalence of male cancer cases was 30.46%, while the prevalence of female cancer cases was 69.54%. Hence females were more affected than males with a male to female ratio of 0.44:1. This corroborates with previous studies in states of Madhya Pradesh and Uttar Pradesh other neighbouring states of Eastern India⁶. In West Bengal the cancer prevalence rates were alarmingly higher in females as compared to males and trend analysis of cancer incidence data for the period showed that the overall rates of cancer are increasing with greater increase among females⁷.

The mean age of occurrence of cancer from our study was 50.2 years for the 1st year which shifted marginally to 50.7 years in the 2nd year and to 51.5 years in the 3rd year. The same for the whole study period was 50.8 years. The most affected age groups were 41-50 with 29.86% followed by 51- 60 with 27.98%. In our study we found the prevalence to be higher in the middle age groups. A female preponderance of cases most of them being either cervical or breast cancer which are usually diagnosed in the pre- or post- menopausal phases account for the higher prevalence rates in the middle age group.

It can be inferred from our study that uterine cervical cancer with 25.34% prevalence was the most common cancer followed by Carcinoma Breast with 23.51%, followed by Head & Neck with 14.59%, followed by carcinoma stomach with 6.60%. This is in line with previous studies which show that in the eastern Indian population the cancer of the breast and cervix forms a largest group⁸. In contrast among the males we found higher prevalence of liver cancer in West Bengal (22.43%) followed by leukaemia (19.23%) and then lung cancer (12.72%)⁹. The same study found that the within the observed prevalence in lung cancer between males and females, males suffered more from lung cancer than females. It could be due to large proportion of men who smoke compared to women.

Cancer of the uterine cervix is one of the leading causes of cancer amongst women in India^{10,11}. Previous studies show that early marriage, early age at first coitus, early age at first child birth, sexual promiscuity, multiparity, low socioeconomic status and poor genital hygiene as major risk factors for cervical cancer in India^{12,13}. The high total fertility rates is another major factor for development of cervical cancer mostly seen in lower socioeconomic classes. Infection with the oncogenic human papilloma viruses (HPV) and also mutations in p53 genes are known to cause cervical cancer. There is evidence that various cytology screening programmes help decrease the prevalence and mortality from cervical carcinoma in India^{14,15}. Improved awareness on cervical cancer has been shown to be associated with early detection of and improved survival in India and elsewhere. Hence adoption of such strategies by our state is of vital importance.

Globally, carcinoma breast is the most frequent cancer among women and India shows a significant increase in cases of breast carcinoma cases over the past decades, especially in the sub-urban areas of India¹⁶. The risk factors for breast cancer are early menarche, late age at marriage, nulliparity and late age at first pregnancy commonly seen in urban women^{17,18}. This urban/rural difference could be due to differences in lifestyle factors. Early detection by the help tumour markers and timely treatment, can help decrease the prevalence of breast cancer.

Considering the geographical distribution of cases, Bargarh district has the maximum prevalence with 26.34% followed by Sambalpur with 24.58%. In total, six districts of Western Odisha accounted for 85% of the prevalence. Few districts from neighbouring Chhattisgarh have the prevalence of 4.09%. In spite of being an urban cancer centre, the population served by our centre caters to mainly the rural population of Western Odisha as well as the neighbouring states of Chhattisgarh and Jharkhand. It is significant to note as about majority of Indians still reside in rural areas. Yet, mortality for specific cancers is estimated mostly with data from India's 24 urban population-based cancer registries, with only two registries representing rural areas¹⁸.

V. Conclusion

With increases in aging population, changing lifestyles and increasing exposure to risk factors, mortality due to cancer is on the rise in our country. Preventable cancers such as those of cervical, liver, and tobacco-related cancers, can be dealt with by early diagnosis of oral, cervical, and breast cancers, enabling effective treatment. Hence, it is time to step up various programmes and strategies across the country as well as in our state to improve the overall healthcare status.

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