



DEMOGRAPHIC DISTRIBUTION OF VARIOUS CANCERS IN PATIENTS ATTENDING RADIOTHERAPY OPD AT TERTIARY CARE CENTRE IN NORTH WEST INDIA

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ABSTRACT

Background: Cancer is a major public health problem globally. The incidence of cancer is increasing rapidly in many low and middle income countries like India due to the epidemiological transition, results in wide variations in cancer distribution throughout India.

Aim: To assess the demographic distribution of cancer in patients in radiotherapy department of North West India of Jaipur region.

Methodology It is a retrospective study conducted in patients attending radiotherapy OPD from 2011 January to 2019 December at SMS Hospital, Jaipur.

Results: A total of 61,488 patients were retrospectively studied from 2011 January to 2019 December. Male patients had more incidence of cancer than female patients. Male female ratio was 1.4:1. Incidence of Head and neck cancer was more in males and Breast cancer in females.

Conclusion: Incidence of cancer is more in males compared to females and most of cancers are associated etiologically which are preventable.

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INTRODUCTION

Cancer is non communicable disease occurs due to abnormal proliferation of cells. It can affect all living cells in the body, to every age group and both genders. The burden of cancer is still increasing worldwide despite various advances available for diagnosis and treatment. There is a multifactorial causation and the disease process differs at different sites. Cancer is a major public health problem globally. According to GLOBOCAN 2018 world data, 18.1 million new cases and 9.6 million deaths occurred respectively.¹ In the world, cancer is the second most common disease after cardiovascular disorders causing maximum deaths. The incidence of cancer is increasing rapidly in many low and middle-income countries like India due to the epidemiological transition. In India, as per recent statistics, over 2.2 million cases are registering every year.² GLOBOCAN 2018 has estimated over 1.1 million new cancer cases and 0.78 million cancer deaths in India in 2018. Sexes combined, breast cancer is the most commonly observed cancer (14% of the total cases) and it is the leading cause of cancer death (11.1% of the total cases) in India.³ Cancers of lip, oral cavity and pharynx, respiratory and intrathoracic organs, digestive organs, lymphoid, haematopoietic and related tissues and genital organs are the leading forms of malignancy among men in the State.

Among women, the leading cancers are those of breasts, genital organs, digestive organs and benign neoplasm. Rajasthan is one of the states with high incidence (5.67%) of cancer in the country.⁴

The geographic distribution of the patients coming to SMS hospital, Jaipur has revealed that almost 70% of the patients come from outside Jaipur and are distributed to all districts of Rajasthan, about 20% being from adjacent states of UP, Haryana, MP and Punjab. No doubt, the data sample is representative of Rajasthan as represent.⁵ As far as the data obtained, throughout the span of years, cancer of Head and Neck constitutes the top cancer (30%) in the hospital coming population.

METHODOLOGY

The study spans over nine years (2011-2019) and is based on retrospective analysis of 61,488 histopathology and cytological confirmed cancer patients attending radiotherapy OPD at SMS Hospital, Jaipur. Classification of various malignant tumors was done according to the International Classification of Disease coding system derived by WHO (9th revision) using code number 140-208. A total of 61,488 cancers were recorded in these nine years (2011-2019). Data was collected and classified in Visual Fox Pro (X Base, Version 6

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Types of Cancers	Male (Incidence)	Female (Incidence)
1. Head and Neck	14821(41.5%)	3643(14.1%)
2. Bronchogenic/Lung	8423(23.5%)	1820(7%)
3. GIT	3312(9.2%)	3701(14.3%)
4. Breast	-	5734(22.2%)
5. Cervix	-	4945(19.1%)
6. Haematology	1223(3.4%)	412(1.5%)
7. Bone tumours	725(2%)	194(0.7%)
8. Brain	460(1.2%)	113(0.4%)
9. Genitourinary	1394(3.9%)	498(1.9%)
10.Ovary	-	2327(9%)
11.other cancers	5350(14.9%)	2393(9.2%)

Types of Cancers	Overall Incidence
1. Head and Neck	18464(30%)
2. Bronchogenic/Lung	10243(16.6%)
3. GIT	7013(11.4%)
4. Breast	5734(9.3%)
5. Cervix	4945(8%)
6. Haematology	1635(2.6%)
7. Bone Tumours	919(1.4%)
8. Brain	573(0.9%)
9. Genitourinary	1892(3%)
10. Ovary	2327(3.7%)
11. Other Cancers	7743(12.5%)

RESULTS

Out of a total 61,488 new cancer cases recorded, 35,708 were males (58%) and 25,780 were females (41.9%), giving a male: female ratio of 1.41: 1 [Table 1]. Frequency of cancers was found to increase exponentially with age. This increase was first seen in 4th decade followed by a continuous spurt up to 7th decade. In 4th decade, prevalence of malignancies was higher in females than in males. Maximum number of cancer cases was seen in 6th decade in males and 5th decade in females [Figure 1].

Site wise distribution of cancers in the overall study group revealed that Head & Neck constituted the most common site (30%) followed by Lung(16.6%), GIT(11.4%), and Breast(9.3%). In males Head & Neck cancer was the leading site of cancer (41%) followed by Lung (23%) while in females, Breast cancer (22%) dominated followed by cervical cancer (19%).

System wise distribution

System wise distribution of cases revealed that head and neck cancers were most common (30%), followed by Lung (16.6%) and Gastrointestinal tract cancers as the 3rd most common group (11.4%). Other commonly involved organ systems were Ovary(3.7%),Genitourinary(3%),Breastcancer(9.3%),Cervix(8%),Haematological(2.6%),Bone tumors(1.4%),and Brain malignancy(0.9%).

Head and Neck cancer

Head and neck cancers formed the single largest group in our study (30% of all cancers) with majority (80%) of these cancers found in male patients and M: F ratio of 4:1. Age distribution of these cancers revealed that maximum numbers of cases were seen between 51 to 60 years of age in males (27.2%) and 41 to 50 years of age in females (26.8%). In the Head and neck region, larynx (3.57%) was the most common tumor site closely followed by tongue (3.48%) and oropharynx (3.43%).

When head and neck cancer cases are grouped together, Oral Cavity was leading (44%) followed by Pharynx (30%), Larynx (20%), Nasal Cavity (3%) and Salivary Gland (3%). Squamous

cell carcinoma was the most common (89.86%) histopathology.

Lung cancer

Lung was the 2nd most common organ affected by malignancies in the overall group with 16% of all cancers. In male it was very common cancer forming the most common site with cancer involvement (23.5%) and the 2nd most common system involved with cancer after head and neck cancer. In female, cancer lung was the 6th most common site involved with 7%cases. Maximum numbers of cases were seen between 51 to 60 years. Non small cell carcinoma formed 69% of total lung cancer cases with small cell carcinoma being 2nd most common (27%). In non small cell lung cancer, squamous cell lung carcinoma 35% of all cases and adenocarcinoma accounts for 34% of all cases.

Gastrointestinal tract malignancies

Among the GI tract cancers, Esophagus was the most common site (29.9% of GI cancers and 3.4% of all cancers) followed by rectum (18.26% of GI and 2.1% of all), gall bladder (14.26% of GI and 1.6% of all), stomach (13.19% of GI and 1.5% of all), colon (12.5% of GI and 1.5% of all), liver (6.1% of GI and 0.7% of all), pancreas (3% of GI and 0.34% of all) and small intestine (2.9% of GI and 0.33% of all).

Breast cancer

Breast cancer constituted the most important group of malignant neoplasm in females with about a quarter (22.2%) of cancer cases in females being diagnosed with breast cancer. It was also the most common (9.3%) group of malignancies in the overall group when cancers at individual sites were reported and the 4th most common site in system wise reporting. Most of the cases were seen in the age group of 41 to 50 years (31.34%). Infiltrating duct carcinoma was the most common histopathological type with 89.3% cases while lobular carcinoma was seen in 1.3% cases only.

Cervical cancer

Cervical cancer constitute 19% among females and 8% overall incidence. The most common histopathology for cervical cancer was squamous cell cancer in 89.3% cases followed by adenocarcinoma in 8% cases.

Ovary cancer

Ovarian cancer constitute 9% among females and 3.7% overall incidence. As for the histopathology of ovarian cancers, adenocarcinoma was present in 63% cases followed by poorly differentiated cancer in 9.26% cases and malignant epithelial neoplasm in 6% cases.

Genitourinary tract malignancies

Genitourinary system formed the another most common system involved with a total of 3% cases. In males, genitourinary tract malignancies formed 3.9% of all cancers while in females, they formed 1.9% of all cancers.

Haematological malignancies

Hematological malignancies as a group were with 2.6%% patients. Age distribution of these cancers revealed a striking difference between the male and female populations. While in male patients, maximum number of cases was found in the childhood and adolescence, in female the most common age

group was 41 to 50 years. As for the Lymphoid malignancies (Hodgkin's and Non Hodgkin's Lymphoma) a bimodal age distribution was observed with peaks in the 3rd and 5th decades of life. As for the histopathological distribution, lymphoid leukemia was the most common type (26%) closely followed by myeloid leukemia (24.28%). Non Hodgkin's lymphoma (18.6%) was the 3rd most common hematological malignancy while chronic myeloid leukemia (14.4%) was the 4th most common hematological malignancy. Hodgkin's lymphoma formed 8.8% of all cases at 5th place.

Brain cancer

Malignancies of the brain in our study formed 1.2% in males and 0.45% in females and overall 0.9%. Age distribution of these cancers revealed that most of these tumors were diagnosed in the 31 to 40 years age group. Histopathological analysis revealed that Astrocytoma (Grade I - III) was most common type (45%) followed by Glioblastoma Multiforme (18%) (Grade IV astrocytoma) and Oligodendroglioma (7%).

Bone and soft tissue cancer

Neoplasm of bone and soft tissues ranked tenth in the overall group forming 1.4% of all the cancers. The proportion of bone and soft tissue tumors was almost equal with former group comprising of 54% and latter comprising of 46% cases. Commonest age group involved was 11 to 30 years for bone tumors and decreasing frequency in higher age groups. Ewing sarcoma was the most common histological type of cancer (28%) followed by Osteogenic sarcoma (21%).

Others

This category included tumors of retroperitoneum, Ill-defined GI cancers, pleura, thymus, ocular tumors and various other unspecified tumors. These tumors comprised 12.5% of all cancers.

DISCUSSION

Cancer is a major public health problem globally. The incidence of cancer is increasing rapidly in many low and middle-income countries like India due to the epidemiological transition.⁶

Rajasthan is one of the states with high incidence of cancer in the country. According to the figures presented by Health Ministry, there were total 11.48 lakh cases of cancer in the state in 2015. Out of them, 65,215 were detected in the state accounting for 5.67% of total cases of the country.⁷ Cancer is a deadly disease which has become close to epidemic. The problem with it is, cancer once detected late, can be fatal for any person. But a sharp distinction can be made between curable cancer and other types where the survival rate is much appreciably low. Interestingly, authentic cancer statistics is something which is not readily available. Often in rural areas, people die even before the detection whereas in some areas, infrastructure for diagnosing cancer is not available. In a vast country like India, due to lack of complete registration of newly diagnosed cases with these cancer registries, the exact tumor burden and profile is often underestimated.⁸

Therefore, Hospital based prevalence data therefore also forms an important part of estimating the cancer burden. This data is essential for assessing geographical differences in cancer profile and ascertaining the required healthcare infrastructure in the management of these cancers.⁸ Our study spans over a

duration of nine years (2011-2019) and includes analysis of approximately 61,488 histopathological reports to find out various malignant neoplasms prevalent in the Jaipur region

The geographic distribution of the patients coming to SMS Medical College, Jaipur has revealed that almost 70% of the patients come from outside Jaipur and are distributed to all districts of Rajasthan, about 20% being from adjacent states of UP, Haryana, MP and Punjab. No doubt, the data sample is representative of Rajasthan as represent.⁷ As far as the data obtained, throughout the span of years, cancer of lip, oral cavity and pharynx constitutes the top cancer (29%) in the hospital coming population. Oncologists highlight high rate of head neck cancers to be caused by tobacco consumption. Cancers of digestive organs follows up next with 15%. Gall bladder cancer has surprisingly emerged to be the prime cancer in this group in Rajasthan which has preponderance in female with a ratio of 70 females to 30 males. Pesticides in food items are alleged to be the cause for high rate of cancers.⁸

Tobacco smoking is the main cause behind most of cancer, out of which lung & head and neck constitutes another 46% of all cancers in our institution. Female breast and uterus cancer together are found to be 17% of all the cancers where early detection by mammography and Pap smear test are the available secondary prevention methods. Awareness is still a major issue as a relatively lower proportion of females constitute the hospital population. Meanwhile blood cancers constitute 10% of all cancers. In children it accounts for almost 50% of all cancers in children.⁹ thankfully, the majority of childhood blood cancers are rated to be "curable" cancers.

CONCLUSION

The most significant factor highlighted in this study were a high frequency of tobacco related cancers (lung, laryngeal and oropharyngeal cancers) in the male population and that of screening detectable cancers in the female population (breast and cervical cancer). Gender wise males had more distribution of patients in study. An unusually high frequency of Gall Bladder Cancers especially among the female population in this region is also a cause of concern. Northern India has a belt of high incidence of Gall Bladder Cancer. There might be an etiological factor related to lifestyle, environment or food which needs to be identified quickly.

The increasing overall contribution of cancer to disease burden in India should motivate more systematic and large-scale approaches to reduce this burden at the population level across the country. These efforts should include improved human resources and infrastructure for prevention, screening, treatment, and palliative care for cancers, as well as adequate financial protection for cancer care.

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