

# Pattern of Cancer in a Tertiary Care Hospital in Malwa Region of Punjab, in Comparison to Other Regions in India

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## ABSTRACT

**Context:** Cancer pattern varies in different regions and depends on race, lifestyle and diet. There is a lack of definitive information regarding hospital-based cancer profile in Southern Punjab, which is a cotton growing area. Excess of toxins in the macro-environment is thought to be the reason for the high incidence of cancer in this area.

**Aims:** To generate data on the magnitude and pattern of cancer cases reporting in the medical college hospital and to plan activities for prevention of cancer in the field practice area.

**Settings and Design:** A five year record-based retrospective study from 1<sup>st</sup> January 2007 to 31<sup>st</sup> December 2011.

**Materials and Methods:** All cancer cases who reported either for diagnosis or for treatment (radiotherapy/chemotherapy/surgery) were included in the study. These confirmed cases of cancer were

classified according to the International classification of Disease (ICD-10) given by WHO.

**Statistical Analysis:** Descriptive statistics, percentages.

**Results:** Out of a total of 1328 cancer cases, females accounted for 809 (60.9%) and males for 519 (39.1%) cases. Male to female ratio was 1:1.55. The maximum number of patients were seen in 35-64 yr age group (63.5%). Top five leading sites of cancer in males were lung (9.6%), myeloid leukemia (8.3%), prostate (6.8%), mouth (6.1%) and gall bladder (6.0%); and in females were breast (35.7%), cervix (19.1%), esophagus (5.1%), myeloid leukemia (4.7%) and gall bladder (3.9%). Our figures have been compared with the national data from NCRP.

**Conclusion:** Population-based epidemiological studies are required to find out the disease burden & its cause in this region.

**Keywords:** Cancer, Magnitude, Prevention, Southern punjab

## INTRODUCTION

A common question of interest is "Is cancer on the rise. Control of communicable diseases, increased life-expectancy and increase in total population has contributed to the increase in number of cancer cases [1]. At global level, cancer accounted for 14.1 million new cases, 8.2 million cancer deaths & 32.6 million people living with cancer (within five years of diagnosis) in 2012 [2]. It has become the 7<sup>th</sup> leading cause of DALY's lost (5.4%) in South-East Asian region in 2011 [3]. It is estimated that during the year 2008, 9.4 lac new cancer cases occurred in India, giving an incidence rate of 98.5 per lac population. Same year about 6.3 lac died of cancer, a mortality rate of 68 per lac population [4].

Variable cancer pattern in different geographical regions may be dependent on genetic, environmental, dietary, social and other factors [5].

An epidemiological study helps to know the common cancers prevalent in particular segments of the population and risk factors involved. This helps in planning the facilities required in a hospital. However, there is a lack of definitive information regarding hospital-based cancer profile in Malwa region of Punjab - which is a cotton growing area. High use of pesticides, presence of toxic metals in sub-soil water, leaching of uranium from rocks, presence of thermal power plants based on coal etc. are thought to be the reasons for the high incidence of cancer in this area. This study was undertaken to determine the magnitude and pattern of cancer cases reporting to this tertiary care hospital located in this region.

## MATERIALS AND METHODS

A hospital-based five year retrospective study was undertaken in the 'Charitable Cancer Hospital' attached to Adesh Institute of Medical Sciences & Research - a teaching medical college hospital. The records of cancer patients generated between 1<sup>st</sup> Jan 2007 to 31<sup>st</sup> Dec 2011 were analyzed from the Central record section. All the cancer cases who reported either for diagnosis

or treatment (radiotherapy/chemotherapy/surgery) were included. All these cases were confirmed on the basis of histopathology, fine needle aspiration cytology, and biopsy or hematology reports. The different sites of cancer were classified according to the International classification of Disease (ICD-10) given by World Health Organization [6].

A single medical registration number is given to each patient at the OPD counter. The information is updated on every re-visit through computerized hospital record maintenance software. The demographic details of the patient, that is, name, age, sex, address, telephone number are recorded at the reception counter. It is therefore possible to recognize and avoid duplication of cases. All the cases lacking the relevant information like demographic details or adequate confirmation of diagnosis were excluded.

The data so collected was fed into Microsoft Excel; Descriptive statistical analysis was done. The cases were grouped according to age, sex & top five leading sites of cancer. These findings were compared with similar studies.

## RESULTS

A total of 1328 cancer cases reported in this tertiary care hospital during the years 2007 to 2011, out of which females accounted for 809 (60.9%) and males for 519 (39.1%) cases [Table/Fig-1]. More females reported with cancer in our study; with a male to female ratio of 1:1.55. There were 16 (1.2%) cases in childhood age-group (0-14 y), 110 cases (8.3%) in 15-34 y age-group, 844 (63.5%) in 35-64 y & 358 (26.9%) in geriatric (>65 y) age-group [Table/Fig-2].

Pattern of cancer was different in the two sexes. In males, maximum cases were of lung cancer (9.6%), followed by myeloid leukemia (8.3%), prostate (6.8%), mouth (6.1%) and gall bladder (6.0%) [Table/Fig-3]. In females (n=809), the top five leading sites were breast (35.7%), followed by cervix (19.1%), esophagus (5.1%), myeloid leukemia (4.7%), and gall bladder (3.9%). [Table/Fig-4].

Sex	No. of Cancer Cases	Relative proportion (%)
Male	519	39.1
Female	809	60.9
Total	1328	100.0

**[Table/Fig-1]:** Sex wise distribution of cancer cases (year 2007-2011) (n=1328)

Truncated Age Group (years)	No. of Cancer Cases	Relative proportion (%)
0-14	16	1.2
15-34	110	8.3
35-64	844	63.5
>65	358	26.9
Total	1328	100.0

**[Table/Fig-2]:** Age wise distribution of cancer cases (year 2007-2011) (n=1328)

## DISCUSSION

The incidence and pattern of cancer vary from country to country and from one region to another region within a large country like India. The burden of cancer is increasing in economically developing countries as a result of population aging, as well as, increasingly, an adoption of cancer-associated lifestyle choices including smoking,

The proportion of cases in the Hospital-based Cancer Registries under the National Cancer Registry Program of India varied between 1.8 – 8.9 in 0-14 y age-group; between 6.8 – 12.5 in 15–34 y age-group; between 60.3 – 67.6 in 35-64 y agegroup and between 16.9 - 24.5 in >65 y age-group [7].

The total malignant cases for males (n= 519) re-grouped according to the five leading sites of cancer showed that lung cancer is the most common site (9.6%), followed by myeloid leukemia (8.3%), prostate (6.8%), mouth (6.1%), esophagus (6.0%) and gall bladder (6.0%) [Table/Fig-3]. In females (n=809), the top five leading sites were breast (35.7%), followed by cervix uteri (19.1%), esophagus (5.1%), myeloid leukemia (4.7%), and gall bladder (3.9%) [Table/Fig-4].

These findings are comparable to the report of Hospital based cancer registries 2007-11 by the national cancer registry program of India which gives a list of leading sites of cancers in both males & females [7] [Table/Fig-3,4].

Globally, in 2012, the most common cancers diagnosed were those of the lungs (1.8 million cases, 13.0% of the total), breast (1.7 million, 11.9%), and large bowel (1.4 million, 9.7%). The most common causes of cancer death were cancers of the lung (1.6 million, 19.4% of the total), liver (0.8 million, 9.1%), and stomach (0.7 million, 8.8%) [18].

Type of Cancer	Mumbai	Bangalore	Chennai	Thi'puram	Dibrugarh	Guwahati	Chandigarh	Present Study (n=519)%
Lung	8.0	7.0	8.9	14.8	3.6	7.4	9.2	9.6%
Myeloid Leukemia	3.9	3.9	4.5	4.9	1.6	0.5	4.3	8.3%
Mouth	12.3	6.5	8.6	8.3	8.9	8.0	3.6	6.1%
Esophagus	4.6	7.9	5.7	4.2	13.1	15.0	6.2	6.0%
Gall Bladder	2.3	0.6	1.0	0.5	2.1	3.8	3.8	6.0%
Prostate	-	-	-	-	-	-	-	6.8%
others	-	-	-	-	-	-	-	57.2%

**[Table/Fig-3]:** Comparative data of leading sites of cancer in Males (2007-11) at NCRP-hospital based cancer registries and present study\* (n=519) (relative proportions). \*NCDIR(NCRP)- Consolidated Report of Hospital Based Cancer Registries 2007-2011 [7]

Type of Cancer	Mumbai	Bangalore	Chennai	Thi' Puram	Dibrugarh	Guwahati	Chandigarh	Present Study(n=809)%
Breast	30.3	15.6	22.4	28.5	14.8	14.4	16.3	35.7%
Cervix	13.4	27.3	25.5	9.3	11.7	16.3	18.4	19.1%
Esophagus	2.8	5.1	3.2	1.6	10.4	10.4	5.1	5.1%
Myeloid Leukemia	2.2	2.6	2.7	3.8	0.8	0.5	2.6	4.7%
Gall Bladder	3.9	0.5	0.7	0.4	7.7	11.6	6.6	3.9%
others	-	-	-	-	-	-	-	31.5%

**[Table/Fig-4]:** Comparative data of leading sites of cancer in Females (2007-11) at NCRP-hospital based cancer registries\* and this study (n=809) (Relative Proportion) \*NCDIR(NCRP)- Consolidated Report of Hospital Based Cancer Registries 2007-2011 [7]

physical inactivity, and “westernized” diets [8]. 57% (8 million) of new cancer cases, 65% (5.3 million) of cancer deaths, and 48% (15.6 million) of the 5-year prevalent cancer cases occurred in the less developed regions [2].

In the present study, out of a total of 1328 cancer cases, females accounted for 809 (60.9%) and males for 519 (39.1%) with a male to female ratio of 1:1.55. This is similar to the increased cancer seen in females in studies carried out in Kolar (0.7:1.0), Jabalpur (0.66:1.0), Bankura (1.0:1.67) & Ludhiana (1.0:1.09) whereas studies carried out at Dehradun (1.7:1), Kashmir (1.5:1), Ambajogai (1.24:1) & Jaipur (1.45:1) reported male preponderance [5,9-15].

In doing the Truncated age-grouping, it was found that maximum patients were between 35-64 y of age-group, that is 844 cases (63.5%). There were 1.2% cases in 0-14 y age-group, 8.3% in 15-34 y, & 26.9% in >65 y age-group [Table/Fig-2]. On further analysis, the peak age of cancer was found to be 50–54 y in both males & females. The frequency of malignancies decreased towards both younger and older age-groups. This is similar to the observations in studies carried out at Ludhiana, Dehradun, Jabalpur, Jammu & Eastern Rajasthan [10-12, 16, 17].

### Leading cancers in Males

The prevalence of respiratory tract malignancies is quite variable in different parts of India. Lung was found to be the most common site in Jammu study, whereas larynx malignancies were more in Ludhiana & Bankura in West Bengal [12,16,17]. Report from hospital based cancer registry 2007-11 under NCRP showed lung to be the top site for malignancy in males in Chandigarh & Thiruvananthapuram, whereas it is the second most common carcinoma in Mumbai & Chennai registries [7].

Tobacco has been directly related to oro-pharynx, lung, esophagus, bladder cancers and myeloid leukemia also in the IARC 2004 monograph. In our study, higher number of lung, mouth, esophagus and myeloid leukemia amongst males appear to be the combined effect of tobacco chewing, tobacco smoking and alcohol consumption. Similar observations were made in other studies too [11,12].

Prostate is one of the leading sites of cancer in males worldwide. In this study, it is the third most prevalent cancer in males (6.8%) [Table/Fig-3]. It was found to be 2.64% in Dehradun, 2.58% in Kolar, 9.65% in Ludhiana & 11.4% in a study carried out in Eastern

Rajasthan [10,12,13,7]. Old age, high calorie diet, physical inactivity & black race in men are the suspected risk factors for prostate cancer [19].

### Leading cancers in Females

Carcinoma breast (35.7%) was the most common cancer in adult females in our study. Our data was comparable to 22.46% in Ambajogai, 20.44% in Jaipur, 21.05% in Ludhiana & 19.4% in Eastern Rajasthan [5,11,14,17]. Breast cancer is the leading cancer in females as seen in the hospital based registries in Mumbai (30.3%), Thiruvananthapuram and Dibrugarh [7]. Breast cancer is common in affluent societies having a western lifestyle. Late age at marriage, nulliparity and late menopause have been linked to breast cancer; the underlying mechanism is probably uninterrupted exposure to estrogen for prolonged periods. Obesity coupled with consumption of high fatty diet along with high pesticide use in this cotton growing area could be the causative agent of breast cancer in women in this region of Punjab. Cancer cervix (19.1%) was found to be the 2<sup>nd</sup> most common cancer in females in this study. It is the most common cancer in Indian women country wide. It is the leading site in Bangalore (27.3%), Chennai (25.5%), Guwahati (16.3%) and Chandigarh (18.4%) [7]. Maximum number of carcinoma cervix malignancies (35.62% & 44.92%) were reported in studies carried out by West Bengal [15,20]. Early marriages, infection with HPV, multiple partners & lack of genital hygiene are some of the contributory factors for the high incidence of this cancer [19].

Myeloid leukemia was found to be one of the leading sites in both males (8.3%) & females (4.7%). This is comparable to the data of NCRP-hospital based cancer registries [7]. Leukemia was one of the common sites of malignancies in females in Ambajogai (7.3%) [14]. Esophageal malignancy has been found to be the commonest digestive system cancer in both males (6.0%) & in females (5.1%). It is a common cancer in males as seen in the data of NCRP-hospital registries. The least incidence was found to be in Thiruvananthapuram, that is, 4.2% in males & 1.6% in females [7]. Oesophageal carcinoma has been associated with smoking, alcohol, malnutrition, poverty, oesophageal injury, achalasia, use of hot beverages, betel nut chewing, chronic gastro-oesophageal reflux, intake of tannin in various form, along with decreased intake of fresh fruits & vegetables [19].

Cancer gall bladder was also found to be high in this study, that is, 6.0% in males and 3.9% in females. Similar high rates have also been found in other cities in India like Jammu & in females in Kashmir [13,16]. Carcinoma gall bladder is more common in women, old age, irritative trauma, chronic inflammation because of gall stones & carcinogenic derivatives of bile acids [19]. High incidence of gallbladder cancer could be because of the high incidence of gallstones in this part of India.

### LIMITATIONS

One needs a population-based study to determine the magnitude and pattern of cancer in an area. Unfortunately, this ideal situation is difficult to attain. In this hospital-study, we have included only those cases which self-reported to this hospital for diagnosis and treatment. Patients who fail to recognize their illness or do not afford to get treated in a hospital are missed in such a scenario. Also,

the common sites of cancers in a given hospital are dependent on a number of factors, for example, accessibility of a particular diagnostic or treatment facility, popularity of a treating physician and affordability of patients. Therefore, a population-based active house-to-house search is required by trained health workers to find out the true magnitude of cancer cases in this area.

### CONCLUSION

This hospital-based study indicates the cancer profile in Southern Punjab. Out of a total of 1328 cancer cases, 1230 cases were from seven districts of Southern Punjab (district Muktsar, Firozpur, Bathinda, Faridkot, Fazilka, Moga & Mansa) also known as Malwa region. However, no large site-specific, population-based epidemiological study has been done so far. These studies need to be done to find out the differences in the epidemiological profile of cancers, to find out the incidence of cancer, and to study the risk factors associated with them. This may also suggest the preventive measures to deal with the increased incidence of cancer in this part of Punjab. A number of 'Cancer Awareness & Health Education' camps have been organized in the Rural Field Practice Area under the Department of Community Medicine since this study was done.

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