

## Original Research Article

# Epidemiological profile of cancer patients attending tertiary care teaching hospital: a record based retrospective study

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## ABSTRACT

**Background:** Cancer, the second leading cause of death worldwide is one of the most dreaded non-communicable diseases. Cancer incidence and demographic data form an important basis for cancer prevention. However, the data available through cancer registries are limited. Thus, the present study aimed to describe the epidemiological profile of cancer patients registered in our hospital.

**Methods:** A record based retrospective study was done assessing the records of the cancer patients, admitted during the year 2017 at Coimbatore Medical College Hospital. The data collected included the epidemiological information like demographic details, place distribution and the type of cancer.

**Results:** A total of 1192 confirmed cases of cancer were studied. Among the study subjects, 1014 (50.9%) patients were male and the age group of 50-69 had the maximum percentage of cancer cases (1121 cases, 56.3%). Most cases came from western Tamil Nadu (1138 cases, 95.5%) and majority of them belonged either to lower (560 cases, 46.6%) or upper lower class (548 cases, 45.9%). The lip, oral cavity and pharynx was the type of cancer having the maximum number of cases (429 cases, 36%) and had high proportion in comparison with world level and national statistics. Nearly 57% cases presented with regional extent of disease.

**Conclusions:** The epidemiological factors leading to high incidence of cancer should be analysed and steps towards cancer prevention should be initiated by altering the associated risk factors.

**Keywords:** Cancer epidemiology, Cancer prevention, Cancer registry

## INTRODUCTION

Cancer, one of the most dreaded non-communicable diseases is an important contributor to the global burden of diseases. It is one of the leading causes of death worldwide, second only to cardiovascular disease.<sup>1</sup> The continuing global demographic and epidemiologic changes signal an ever increasing cancer burden over the coming decades, particularly in developing countries like India.<sup>2</sup> The Indian Council of Medical Research (ICMR) has estimated that India will have nearly 17.3 lakh new cases of cancer and over 8.8 lakh deaths due to cancer in the year 2020.<sup>3</sup> The role of prevention and early diagnosis has been emphasized for various types of cancer in the recent decade.<sup>4,5</sup> Information on cancer trends and

patterns is the cornerstone for determining the priorities for cancer prevention in different parts of the world. Moreover, recent studies indicate a change in demographics for various cancers.<sup>6,7</sup> Although mortality rates and years of life lost from cancer form an important basis for cancer prevention, cancer incidence and demographic data provide valuable information on the risk factors of different cancers, independent of prognosis. In India, the incidence and mortality data is mainly generated by cancer registries. As of March 2016, there are 27 population-based cancer registries and 29 hospital-based cancer registries in India.<sup>8</sup> These registries reflect the cancer profile of the country fairly well owing to representation of registries from different parts of the country. However, the coverage is less than 10% of the

population of India.<sup>8</sup> Hence, in their absence recourse must be made with hospital-based data. Thus, the present study aims to describe the epidemiological profile of cancer patients registered in our hospital and to find the proportion of individual cancer types and compare it with that of the cancer incidence and patterns in cancer registries.

## METHODS

A record based retrospective study was conducted at the Department of Oncology, Coimbatore Medical College Hospital, Coimbatore, Tamil Nadu, India. The department deals with approximately 1500-2000 patients per year and extensive care and follow up is given for each patient. It also receives cases referred from hospitals in the neighboring districts like Tiruppur, Erode, Namakkal and Palakkad. The confirmed cases of cancer who have attended Coimbatore Medical College Hospital (CMCH) during the study period were included in the study. The study was conducted over a period of six months from May 2018 to October 2018. Time bound sampling was done. All the 1992 patients, confirmed and registered in the department of oncology were included in the study. A pre-tested, semi-structured case study form was used to collect the patient information.

The case study form has four parts: a) Demographic details: It includes the age, sex, socio-economic status and the residential address of the patients. Confirmed cancer cases in all age groups were included. Socio-economic status of the patients were classified according to the Modified Kuppuswamy scale.<sup>9</sup> The residential address of patients were noted. b) Type of cancer: The cancer cases were divided into 14 broad types based on the site. The tumour site was defined by the International Classification of Disease for Oncology, Second Revision (ICD-O-2) topography codes. c) Stage of cancer: It includes the clinical extent of disease of presentation at the time of registering. It consists of four categories- localised, regional, distant and others. The proportion under the category 'others' mainly refers to lymphomas and leukaemias, which are generally not staged according to the above system. d) Treatment modality: type of therapy- chemotherapy, radiotherapy and/or surgery will be analysed. 'Others' refers to other treatment modalities and 'no cancer directed treatment' which includes those not received or not accepted treatment, received incomplete treatment and whose treatment status is unknown.

The Department of Oncology, Coimbatore Medical College Hospital, Coimbatore which is a Regional Cancer Centre (RCC) maintains an extensive tumour register whereby all reported malignancies are assembled into a standardized versatile format, which is available for the examination of disease patterns. The Institutional Human Ethics Committee approval was obtained before starting the study (No. 0128/2018). The Medical Records Officer of the hospital was approached and the tumour register as

well as the patient records were accessed. The data were void of personal identifiers and the patient confidentiality was maintained. The collected data were entered in Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS) version 20. Data were collected as categorical variables and results are displayed as proportions and tables, pie-charts and graphs were used to demonstrate the results

## RESULTS

The socio-demographic characteristics of the study population were depicted in Table 1.

**Table 1: Socio-demographic characteristics of the study population.**

| Socio-demographic characteristics | Number (n=1992) | Percentage |
|-----------------------------------|-----------------|------------|
| <b>Age group (in years)</b>       |                 |            |
| 0-10                              | 10              | 0.5        |
| 10-20                             | 21              | 1.1        |
| 20-30                             | 45              | 2.3        |
| 30-40                             | 137             | 6.9        |
| 40-50                             | 397             | 19.9       |
| 50-60                             | 557             | 28         |
| 60-70                             | 564             | 28.3       |
| 70-80                             | 218             | 10.9       |
| >80                               | 43              | 2.2        |
| <b>Gender</b>                     |                 |            |
| Male                              | 1014            | 50.9       |
| Female                            | 978             | 49.1       |
| <b>Socio-economic status</b>      |                 |            |
| Lower class                       | 929             | 46.6       |
| Upper lower class                 | 915             | 45.9       |
| Lower middle class                | 125             | 6.3        |
| Upper middle class                | 23              | 1.2        |
| <b>Clinical extent</b>            |                 |            |
| Localised                         | 357             | 17.9       |
| Regional                          | 1123            | 56.4       |
| Distant                           | 242             | 12.1       |
| Others                            | 270             | 13.6       |
| <b>District wise distribution</b> |                 |            |
| Coimbatore                        | 1139            | 59.8       |
| Tiruppur                          | 363             | 19.1       |
| Erode                             | 170             | 8.9        |
| Nilgris                           | 88              | 4.6        |
| Salem                             | 80              | 4.2        |
| Namakkal                          | 39              | 2.1        |
| Dharmapuri                        | 20              | 1.1        |
| Krishnagiri                       | 03              | 0.2        |

Amongst the total 1992 study subjects, 1014 (50.9%) patients were male and 978 (49.1%) were female. Our study population was distributed from the age of 2 to 93 years with a mean age being 54.9±13.3 years. The age group of 50-69 was found to have the maximum

percentage of cancer cases (1121, 56.3%), followed by the age group of 30-49 years (534, 26.8%). As per the socio-economic status by the Modified Kuppuswamy scale, majority of them belonged either to lower (929, 46.6%) or upper lower class (915, 45.9%). The clinical extent of disease at the time of registering to our hospital was estimated as regional, localised, distant and others. Nearly 57% of cancer cases presented with regional extent of disease. Localised and regional extent contributed to nearly 75% of cases. The maximum number of cases came from western part of Tamil Nadu (1902, 95.5%). Nearly 59.8% cases (1139) are from the Coimbatore district, followed by Tiruppur (363, 19.1%) and Erode (170, 8.9%) districts respectively.

**Table 2: Distribution of cancer cases according to type of treatment.**

| Type of treatment                            | Number (n=1992) | Percentage |
|--|-----------------|------------|
| <b>Surgery alone</b>                         | 236             | 11.8       |
| <b>Chemotherapy alone</b>                    | 423             | 21.2       |
| <b>Radiotherapy alone</b>                    | 805             | 40.4       |
| <b>Surgery + chemotherapy</b>                | 105             | 5.3        |
| <b>Surgery + radiotherapy</b>                | 256             | 12.9       |
| <b>Radiotherapy + chemotherapy</b>           | 40              | 2          |
| <b>Surgery + chemotherapy + radiotherapy</b> | 69              | 3.5        |
| <b>Others</b>                                | 58              | 2.9        |
| <b>Total</b>                                 | 1992            | 100        |
| <b>Modality of therapy*</b>                  |                 |            |
| <b>Single</b>                                | 1464            | 73.5       |
| <b>Combination</b>                           | 470             | 23.6       |

\*Excludes type of treatment classified as 'Others'

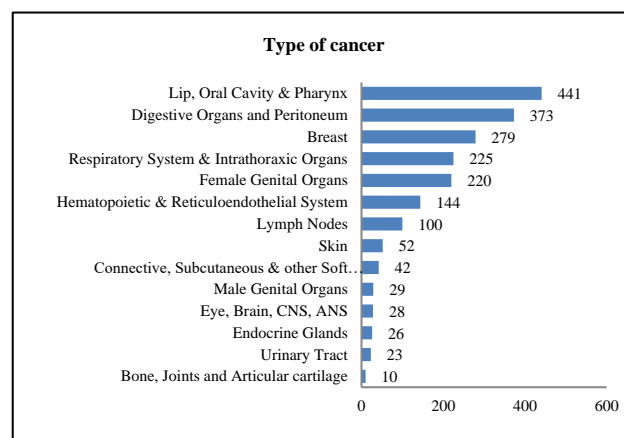
Distribution of cancer cases according to type of treatment was shown in Table 2. Majority of them were treated with radiotherapy (40.4% patients). 'Others' refers to other treatment modalities and 'no cancer directed treatment' which includes those not received or not accepted treatment, received incomplete treatment and whose treatment status is unknown.

**Table 3: Comparison of type of cancer incidence with various statistics.**

| Type of cancer          | Incidence Present study | Incidence World <sup>10</sup> | Incidence India <sup>12</sup> |
|-------------------------|-------------------------|-------------------------------|-------------------------------|
| <b>Breast</b>           | 14%                     | 11.9%                         | 14.3%                         |
| <b>Lip, oral cavity</b> | 13.9%                   | 2.1%                          | 7.6%                          |
| <b>Cervix</b>           | 08%                     | 07%                           | 12.3%                         |
| <b>Colorectum</b>       | 7.9%                    | 09%                           | 6.3%                          |
| <b>Lung</b>             | 7.1%                    | 12.9%                         | 6.9%                          |
| <b>Pharynx</b>          | 7.1%                    | 01%                           | 3.8%                          |
| <b>Esophagus</b>        | 06%                     | 3.2%                          | 4.1%                          |
| <b>Stomach</b>          | 4.3%                    | 6.8%                          | 6.2%                          |
| <b>Ovary</b>            | 01                      | 3.6                           | 2.6                           |
| <b>Prostate</b>         | 0.4                     | 7.6                           | 1.9                           |

It is seen from Table 3 that lip and oral cavity cancer has high proportion (13.9%), in comparison with world level and national statistics (2.1% and 7.6% respectively). The proportion of breast cancer (14%) is coincides to that of world level and national incidence (11.9% and 14.36% respectively).

As shown in Figure 1 that according to ICD-O-2 topography codes, the lip, oral cavity and pharynx were the most common type of cancer with maximum number of cases (441, 22.1%), followed by digestive organs and peritoneum (373, 18.7%) and breast (279, 14%).



**Figure 1: Distribution of cancer cases according to the type of cancer.**

## DISCUSSION

Cancer incidence and mortality data forms the basis for cancer control in any country. These data not only establish the magnitude of disease, but may also indicate the aetiology, the impact of socio-demographic changes, and point towards certain specific cancer types which will form the priorities for cancer control. The current study analysed the cancer pattern of patients attending a tertiary care hospital in Coimbatore. Among the cancer cases, nearly 1014 (51%) were males and 978 (49%). The sex ratio percent (number of male patients per 100 female patients) is approximately 104. Similar results were seen in the cancer pattern of the world (110) and India (99).<sup>10,11</sup> In our study, we found that the proportion of lip and oral cavity cancer, which is predominant in males was nearly 13.9%, in strong contrast to the proportion of 2.1% in the world. Lung cancer, which is the most common cancer in the world (13%), had a proportion of 7% in our study. Similarly the cervical cancer had a proportion of 8% in our study in comparison with 12.3% incidence rate in India.<sup>10,11</sup> This shows the varied cancer pattern, despite similar sex ratios. Further research can be done to explain the factors leading to this varied pattern.

The age group of 60-69 years had the maximum percentage of cancer cases (28.3%), followed by the age group of 50-59 years (28%). Our results are in accordance with the studies done by Ferlay et al and Yancik et al.<sup>11,12</sup>

Population ageing is often considered to be the main factor for increase in cancer incidence, mortality and morbidity.<sup>12</sup> Hence, the pursuit of healthy and active ageing should be done as a priority for modern India similar to maternal and child health care.<sup>11</sup>

Most of the cancer cases belonged either to lower class (46.6%) or upper lower class (45.9%) of socio-economic status. CMCH mainly deals with patients belonging to lower and upper lower socioeconomic status. So, the relationship between cancer incidence and socio-economic status cannot be inferred from our study. Regarding the residence of cancer cases, although 96% of cases came from the west zone of Tamil Nadu, nearly 43% of cases came from districts other than Coimbatore. Newer initiatives like the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke and the introduction of insurance schemes such as the Ayushman Bharat National Health Protection Scheme (AB-NHPS) and similar state-level initiatives have helped in the referral of the cases to higher centres.

In the present study, the proportion of lip and oral cavity cancer was nearly 13.9%, in strong contrast to 2.1% incidence rate in the world and 7.6% proportional incidence rate in India.<sup>10,11</sup> Hence the risk factors leading to high incidence of lip and oral cavity cancer in this region should be investigated and appropriate steps should be taken for cancer prevention as well as in the early diagnosis, thus reducing the incidence and mortality of this type of cancer. Generally tobacco smoking and alcohol are the most important causes for this type of cancer. Interventions for smoking prevention or cessation are much effective when designed by individual counsellors, physicians, or workplace programmes. Moreover, national smoke-free programs and policies have public health benefits for both alcohol- and tobacco-related health problems.<sup>13</sup>

In our study, there were nearly 279 cases of breast cancer, which is about 14% of all cases of cancer. The most important breast cancer risk factors include age, reproductive factors, family history, mammographic density, and atypia in a prior benign breast biopsy. Identifying the high risk patients and early diagnosis by mammography is the most important step towards the prevention of this type of cancer.<sup>13</sup>

In this study, there were nearly 160 cases of cervical cancer, which is about 8% of all cases of cancer. Prophylactic HPV vaccine and early detection advocating techniques like visual inspection of the uterine cervix, after application of 5% acetic acid (VIA) and/or of Lugol's iodine (VILI) and Pap smear is important in the prevention of cervical cancer.<sup>13</sup>

About 57% of cancer cases presented with regional extent of disease, 18% with localised disease and 12% with distant (advanced) disease. This is better when compared

with the study conducted at Cancer Institute (WIA), Chennai- where just 2% presented with localised disease and 17% presented with advanced disease.<sup>14</sup> This difference can be attributed to the early prompt referral from the various peripheral hospitals to our hospital. Radiotherapy is the predominant treatment received by nearly 40% of cases. This is in accordance with the study conducted at Cancer Institute (WIA), Chennai.<sup>14</sup>

## CONCLUSION

Epidemiological information on cancer including the pattern and socio-demographic factors is fundamental in determining the priorities for cancer control in the given population group. The cancer registries in India take into account only a representative sample of the whole country. This study shows that there is marked difference in the cancer pattern of our hospital in comparison with the national statistics. Lip and oral cavity cancer in our study, almost shows double the percent of cases compared with national statistics. Hence factors leading to such high incidence should be analysed and steps towards prevention of this type of cancer should be taken to reduce the morbidity and mortality of cancer. Further, more such research can be conducted all over the country to find the cancer pattern of different areas and thus pave the way for effective preventive measures.

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