Section: Pathology

Original Research Article

ANALYSIS OF HISTOPATHOLOGICAL SPECTRUM OF MALIGNANCIES IN TERTIARY CARE HOSPITAL-RETROSPECTIVE STUDY

P. Banuchitra[1], N. V. Vanitha[2], N. Hemavathy[3], V. Palaniappan[4], S. Ravi[5]

[1]Post Graduate, Department of Pathology, Chengalpattu Medical College, India.
[2]Associate Professor, Department of Pathology, Chengalpattu Medical College, India.
[3]Associate Professor, Department of Pathology, Chengalpattu Medical College, Residential Address-No.35, 2nd Main Road, Perumal Nagar, Old Pallavaram, Chennai, India.
[4]Associate Professor, Department of Pathology, Chengalpattu Medical College, India.
[5]Professor, No.13, Bharathy Street, Madhuranthakam, Drsravi, India.

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Corresponding Author:
Dr. P. Banuchitra,
Email: banuchitra04@rediffmail.com

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ABSTRACT

Background: Aims and Objectives: Cancer represents a substantial burden in India, with a huge population affected by the disease, and there is a yearly rise in cancer-related fatalities, making it the second leading cause of death globally. Data on cancer statistics may help the planning, monitoring, and assessment of cancer control initiatives. This study aims to assess the trends in frequency of malignancies reported at a tertiary care centre over three years from 2022 to 2024, to identify the percentage of new malignant cases with respect to age, site, and gender, and to determine the common types of malignancies reported at Chengalpattu Medical College. **Materials and Methods:** This is a retrospective cross-sectional research of malignant cases derived from biopsies obtained at the Department of Pathology, Government Chengalpattu Medical College and Hospital, spanning a three-year period from 2022 to 2024. **Findings**: Out of 17265 specimens, 997 cases were malignant. Of these, 552 were females and 445 were males; male: female ratio 0.8:1. The Top five malignancy sites were Head and neck (19.1%), breast (16.9%), Gastrointestinal tract (16.8%), female genital tract (16.2%), and skin (7%). The commonest sites in males and females were head and neck (31.6%) and breast (29.9%), respectively. Commonest age group: 51-60 years (30.6%). The youngest and eldest ages were 11 years and 98 years respectively. The commonest histopathological types were Squamous cell carcinoma, Infiltrating ductal carcinoma, and Adenocarcinoma in head and neck, breast, and Gastrointestinal tract, respectively. **Conclusion:** This study shows an increasing trend of overall malignancies reported from 5.2% to 5.9% between the years 2022 and 2024; incidence of breast cancer and gastrointestinal tract cancer has increasing and decreasing trends, respectively. Incidence is most common in 6th decade. Given that cancer incidence increases after the age of 50 according to the study, this demographic may be prioritized for health education and screening, facilitating timely intervention.

INTRODUCTION

Cancer poses a significant burden worldwide. It is the second leading cause of mortality globally, following cardiovascular disease. Enhanced longevity, evolving lifestyles, increasing consumption of fast and junk food, reduced intake of antioxidant-rich foods, and improved management of infectious and non-communicable diseases have made cancer an important public health concern.[2]

According to Global Cancer registry 2022 cancer incidence is 1,99,76,499 cases and mortality is 97,43,832 cases, and has become a major global burden. Globally gastrointestinal tract (24%), lung (12.4%), and breast (11.5%) were the top three sites of malignancies. In India incidence is 14,13,316 cases, cancer deaths were 9,16,827 cases, and top three malignancy sites are gastrointestinal tract (19.8%), Head and neck (17%), and female genital tract (14.2%).[3]

By 2040, the annual incidence of new cancer cases is projected to reach 29.9 million, with cancer-related fatalities anticipated to total 15.3 million[4]. This study aimed to identify the predominant histological types and locations of malignancies documented at the tertiary care centre, as well as to analyse the trends of malignancies reported at the facility.

Neoplasia is characterized in Robbins as an aberrant tissue mass exhibiting uncoordinated growth relative to normal tissue, persisting excessively even after the

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removal of the stimulus that induced it. Cancer is a condition characterized by the uncontrolled proliferation of certain cells within the body, which then spread to other regions. It is not one disease but many, all sharing a profound dysregulation of growth[10].Cancer is a Latin word for Crab, as they infiltrate and seize upon the normal tissues in an obstinate manner.[10]

An unhealthy lifestyle, characterized by increased consumption of saturated fats, calorie-dense foods, and physical inactivity across numerous countries and regions, has resulted in a notable escalation in cancer incidence trends. While the whole effects of unhealthy lifestyle changes on the cancer burden in less developed or economically transitioning countries may take decades to become evident, concerning trends in cancer rates have already surfaced in these nations.

The estimated rise of cancer in population is projected to be 29.9 million by 2040[4].The proportion of newly diagnosed cases of cancer in under developed countries is projected to increase to around 60% of the world total cases in 2030[6].Hence, analysing histopathological spectrum and trends of malignancies may help to know the cancer burden of that area and to plan for screening & treatment part.

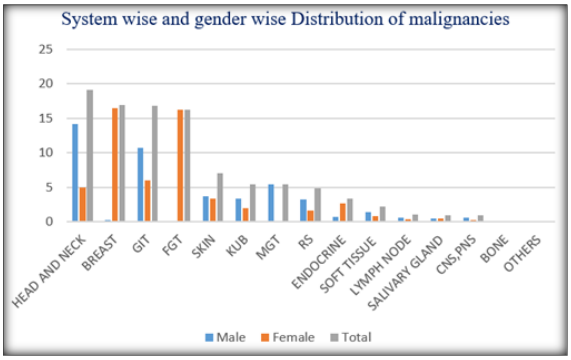
MATERIALS AND METHODS

This is a retrospective cross-sectional analysis of all malignant histopathological specimens obtained in the Department of Pathology at Chengalpattu Medical College over the period from January 1, 2022, to December 31, 2024 (three years). A total of 17,625 specimens had been received at the department of pathology over the past three years, of which 997 have been classified as malignant. The diagnosis was based on histological analysis of the biopsy specimen. Ethical approval has been obtained from the Ethics Committee of Chengalpattu Medical College. The data regarding the malignant cases which included Variables like sex, gender, site, biopsy number, clinical and histopathological diagnosis has been used. Data analysis performed using Microsoft excel and results has been arrived.

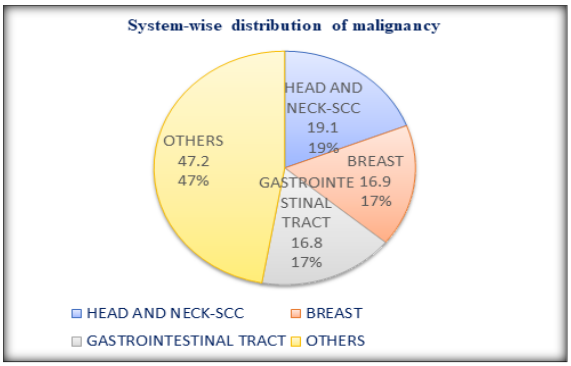
RESULTS

Out of 17265 specimens, 997 cases were malignant. Of these, 552 were females and 445 were males; male: female ratio 0.8:1.

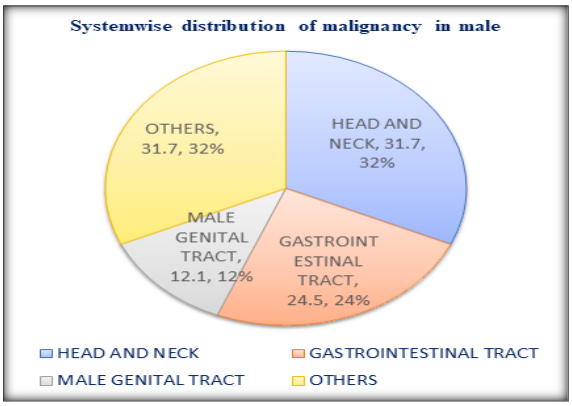
The top 3 sites of malignancies reported in our study as in table 2 and picture 2 were Head and neck (19,1%), breast (16.9%) and Gastrointestinal tract (16.8%). The system wise and gender wise distribution of malignancies is also depicted in picture 1. [Picture 1]



Picture 1: Bar Chart On distribution of malignancy

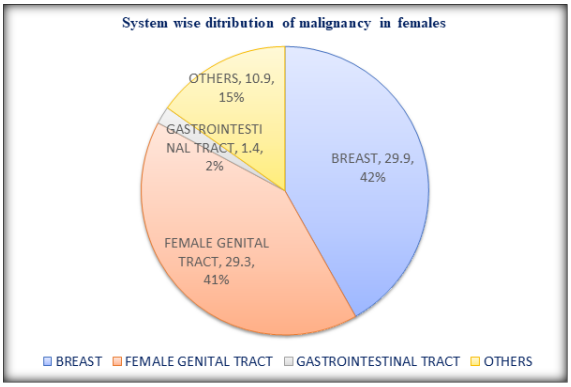


Picture 2: Occurrence of Malignancy-Overall



Picture 3: Pie chart showing system -wise distribution in males

Commonest site in female-breast (29.9%). Commonest age group is 51-60 years (30.6%) (as shown in table 4 and picture 4). [Picture 4]



Picture 4: System-wise distribution in females

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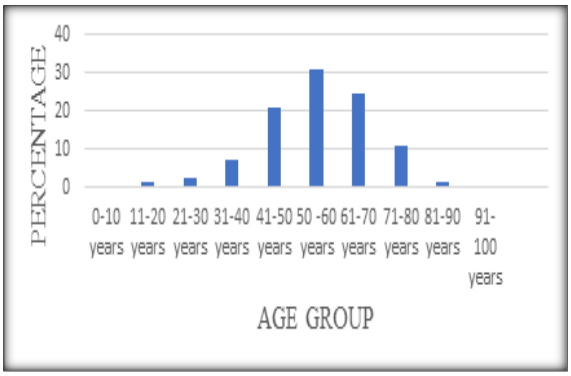
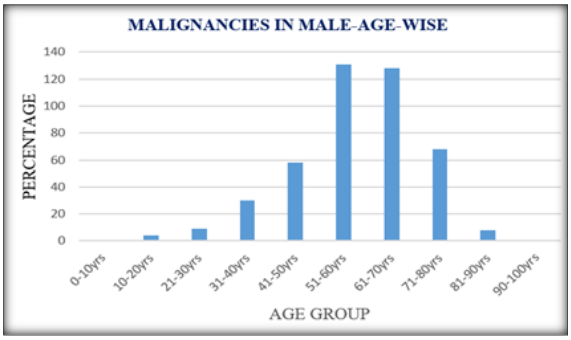
The overall distribution of malignancies in our study is as depicted in the following table (5) and bar chart (picture 5) commonest age group of cancer distribution is in 51 -60 years as.

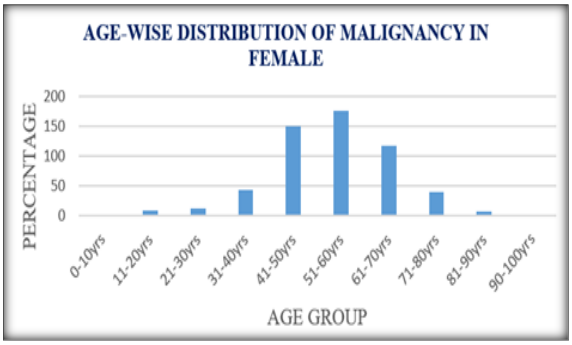


Picture 5: Age -wise distribution of malignancies

The commonest age group in males- 51-60 years (131) followed by 61 years to 70 years (Table 6 and picture 6) and the commonest age group in females is 51-60years (176) followed by 41 -50 years as depicted in Table 7 and Picture 7).



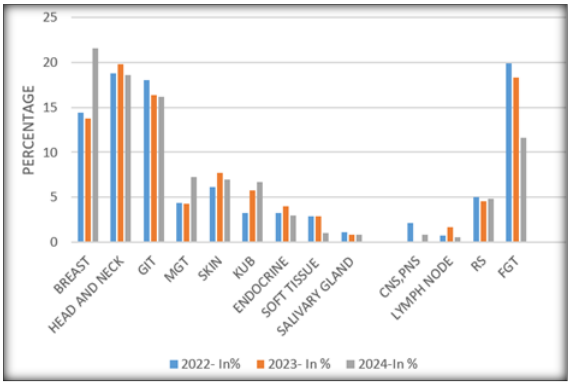
Picture 6: Age-wise distribution of malignancies in male



Picture 7: Age-wise distribution in females

In our study over the period of 3 years, the youngest age at which malignancy has been reported was 11years, germ cell tumour, dysgerminoma right ovary in a female child and the eldest age at which malignancy has been reported was 98 years a case of moderately differentiated squamous cell carcinoma of glans penis.

The incidence of cancer shows an overall increasing trend from 5.2% to 5.9% over 3 years as depicted in picture 8, we could observe that there is an increasing trend for breast cancer, male genital tract and kidney, ureter, bladder cancer while there is a declining trend for gastrointestinal tract and female genital tract and variable trends for other malignancies.



Picture 8: Trends in Malignancies Over Three Years

Table 1: Results of year wise data or malignancy

Year	2022		2023		2024	
Total Cases	5238		5762		6265	
Total Malignancies	277		349		371	
Gender	M	F	M	F	M	F
Malignancies	156	151	164	185	147	224
M: F	0.8:1		0.9:1		0.7:1	

Table 2: System wise distribution -overall

System	%	Histopathological Type
Head and neck	19.1	Squamous Cell Carcinoma
Breast	16.9	Infiltrating Ductal Carcinoma
Gastrointestinal tract	16.8	Adenocarcinoma

Table 3: System wise distribution- males

System	%	Histopathological type
Head and neck	31.7	Squamous cell carcinoma
Gastrointestinal tract	24.5	Adenocarcinoma
Male genital tract	12.1	Squamous cell carcinoma

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Table 4: System wise distribution-females

System	%	Histopathological Type
Breast	29.9	Infiltrating Ductal Carcinoma
Female genital tract	29.3	Squamous cell Carcinoma
Gastrointestinal tract	10.9	Adenocarcinoma

Table 5: Age -Wise Distribution of Cases

Age in years	No. of cases	Percentage
0-10years	0	0
11-20 Years	13	1.4
21-30 years	24	2.4
31-40 years	74	7.4
41-50 years	208	20.9
51-60 years	307	30.8
61-70 years	247	24.8
71-80 years	108	10.8
81-90 years	15	1.5
91-100 years	1	0.1
Total	997	100

Table 6: Age -wise distribution in males

Age In Years	Males
0-10 years	0
11-20 years	4
21-30 years	10
31-40 years	31
41-50 years	58
51 -60 years	131
61-70 years	127
71-80 years	68
81-90 years	8
91-100 years	1
Total	438

Table 7: Age wise distribution in females

Age In Years	Females
0-10 years	0
11-20 years	9
21-30 years	14
31-40 years	43
41-50 years	150
51 -60 years	176
61-70 years	120
71-80 years	40
81-90 years	7
91-100 years	0
Total	559

DISCUSSION

Cancer poses a significant burden worldwide especially in developing countries. One in 9 Indians are expected to develop cancer during their lifetime[2].Occurrence of cancer varies with age, site and gender and there is variation in the trends of cancer due to changing lifestyle and implementation of various programme.

In 2012, cancer globally resulted in 14.1 million new cases, 8.2 million fatalities, and 32.6 million individuals living with cancer within five years of diagnosis.

In our country, hundreds of thousands of individuals die due to cancer annually. Many individuals lack adequate access to a suitable healthcare system, and those who do often seek assistance at a more advanced stage of their condition.

As per the 2015 estimates by the World Health Organization (WHO), cancer ranks as the primary or secondary cause of mortality in 91 out of 172 nations, and as the tertiary or quaternary cause in 22 countries, prior to the age of 70 years.[11]

The National Cancer Registry Programme (NCRP) was established in India in 1982, under the Indian Council of Medical Research (ICMR). It offers statistics on the incidence rates of various malignancies[12] .In India in 2008, it was projected that 940,000 new cancer cases were reported, with an incidence rate of 98.5 per 100,000 people, and 630,000 individuals succumbed to cancer, resulting in a mortality rate of 68 per 100,000 population.[7]

In our study out of a total of 17265 cases, 997 were malignant and the total malignancies reported over 3 years -2022, 2023 and 2024 were 277, 349 and 371 respectively; and the male: female ratio were 0.8:1, 0.9:1 and 0.7:1 forming an average ratio of 0.8:1 as

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depicted in table 1. And the male: female ratio is almost in concurrence with Kanchana et al[2]study where it is 1:1.8.

In our study, as given in table 2 and picture 2, and also as compared in table 8, Head and neck(19.1%) forms the most common site of malignancy and the mostly it is squamous cell carcinoma which is in concurrence with Khandekar et al(20.9%) [1] , breast cancer(16.9%) forms the second most common type of malignancy and infiltrating ductal carcinoma is the most common among them which is in concurrence with Kushwaha et al(19.8%) and gastrointestinal tract(16.8%) forms the third most common type of malignancy and adenocarcinoma is the commonest histopathological type, which is concurrence with GLOBACON 2022 -worldwide data.[3]

Table 8: Comparison of System-Wise Cancer Frequency

SITE	Our study	GLOBACON 2022 –Indian data	GLOBACON 2022-Worldwide	Khandekar et al	Kushwaha et al	Kanchana et al
Head and neck	**19.1**	17	7.4	20.9	16	4.8
Breast	**16.9**	13.6	11.5	19.5	19.8	4.8
Gastrointestinal Tract	**16.8**	19.8	24	13.2	31.3	9.5
Lung	**4.8**	5.7	12.4	4	1.4	31
Female genital tract	**16.2**	14.1	7.4	17.6	6.9	21.4

As given in table 3 and picture 3, and also as compared in table 9, the top three malignancy sites in males in our study are Head and neck (31.7%) which is almost similar in the study of Khandekar et al (30.2%) followed by Gastrointestinal tract (24.5%) that is concurrence with worldwide data (25.3%) and male genital tract (12.5%) which is concurrence with Khandekar et al (13.2%).

Table 9: Male - Commonest Sites

Site	Our study	Indian data	World wide	Sathish Kumar et al	Kushwaha et al	Khandekar et
Head and neck	31.7	27.7	6.5	17.3	29.1	30.2
GIT	24.5	19.7	25.3	16.7	35.5	12.1
MGT	12.1	5.7	15.3	6.1	4.6	13.2
Lung	7.1	8.5	15.2	10.6	2.4	6

As depicted in table 4 and picture 4, the commonest sites of malignancies in females are breast (29.9%) which is similar to Khandekar et al (28.3%) followed by female genital tract (29.3%) that is concurrence with Indian data (27.7%) and gastrointestinal tract (10.9%) as compared in table 10.

Table 10: Female -Commonest Sites

Site	Our study	World data	Indian data	Kushwaha et al	Khandekar et al	Sathish Kumar et al
Breast	29.9	23.8	26.6	31.4	29.3	28.8
FGT	29.3	15.2	27.7	11.5	25.8	20.6
GIT	10.9	16.7	14.5	28.3	8.3	7.9
Head and neck	8.8	2.2	7.2	6.7	15	3.2

An increasing trend has been observed in our study for breast cancer and decreasing trend for gastrointestinal tract, which is depicted in picture[8] .Study by Sathish Kumar et al,[11] says all the cancers have increasing trends especially Gastrointestinal tract.

The most common age group reported was 6th decade as in table 5 and picture 5 and is in concurrence with Kushwaha et al it was 5th and 6th decade[4]. In the study done by Kanchana et al it was 7th decade[2]. The predominant age group for reported malignancies in males, as illustrated in Table 6 and Figure 6, was 51 to 60 years, followed by 61 to 70 years. In females, the most prevalent age group was again 51 to 60 years, succeeded by 41 to 50 years, as shown in Table 7 and Figure 7.

The youngest age at which the malignancy has been reported in our study was a 11 year old female child, a case of Germ cell tumour-Dysgerminoma right ovary and the eldest age at which malignancy has reported in our study was 98 years, a case of infiltrating squamous cell carcinoma, Glans penis.

There were certain rare malignancies reported distal jejunum -Non Hodgkin's lymphoma in 55 year old male, Mucinous(mucoid) adenocarcinoma of penis in a 90 year male; Intra-cystic adenocarcinoma of breast in a 50 year old female; Skin Collison tumour - Keratoacanthoma with pigmented basal cell carcinoma in a 70 year female, Extra-skeletal Ewing's sarcoma, alveolar rhabdomyosarcoma of leg in a 51 year male and in a 75 year old male with left temporo- parietal space occupying lesion reported as metastatic carcinomatous deposits with primary of follicular carcinoma thyroid etc.

The current study gives the details of the most common malignancies reported and also the interpretations has been arrived regarding the distribution based on age group, gender and site and

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also all these has been compared with the worldwide and Indian data and also with the data of other similar studies done at various other regions. Our study also reveals that in females the routine complete breast examination and Visual inspection by acetic acid or PAP smear for cervical cancer screening above 30 years and especially above 40 years and follow up is of prime importance for females. And oral cancer screening as a routine in non-communicable disease screening programme is also inevitable, as the oral cavity contributes to the maximum number among the overall head and neck cancer in males as well as females.

CONCLUSION

This study shows an increasing trend of overall malignancies reported from 5.2% to 5.9% (2022 - 2024); Increasing Trend is observed in breast cancer (14.4% to 16.8%) whereas the Gastrointestinal tract (18% to 16.7%) cancer shows declining trend. Commonest age group is 6th decade. The commonest type of cancer in male is Squamous cell carcinoma- Head and neck while in female it is- Infiltrating ductal carcinoma- Breast

This is conducted as a pilot project. A multicentre trial with follow-up will provide additional insights. The incidence of cancer is persistently rising, particularly in emerging nations. Therefore, proactive steps must be implemented to mitigate the future burden of cancer. Ongoing surveillance of cancer trends is crucial to tackle the problems posed by cancer and mitigate its societal burden. The current study aims to determine the predominant age range for various cancers, the different histological kinds described, and the most prevalent malignancies in males and females. This study indicates a growing necessity for cancer screening programs, including endoscopic biopsies, comprehensive breast examinations, VIA or PAP smear tests, and oral cancer screenings. The results of this study establish a basis for evidence-based decision-making, resource distribution, and the formulation of focused interventions.

Limitations: The results of this study are pertaining to the area and population of Chengalpattu district and cannot be generalized to the other areas of the state due to different environmental, life style and demographic changes. And the findings of this study had been derived from only those specimens which have been received in the department of Pathology, Chengalpattu Medical College.

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Conflict of interest: The authors declare no conflict of interest

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