Spectrum of Malignancies in a Tertiary Care Hospital – A Retrospective One Year Study

Vallalkani K N [1]*, Sumithra A [2], Jayaganesh P [3]

[1, 2, 3] Department of Pathology, Saveetha Medical College and Hospitals, Chennai, Tamil Nadu, India.

Email: [1] vallakrish@gmail.com

Abstract

INTRODUCTION: Cancer continues to be the leading cause of mortality and morbidity all over the world despite several advancements in diagnostic and therapeutic aspects. The present study provides a framework for assessing and analysing the impact of cancer in a small district in Tamilnadu, India.

OBJECTIVES: 1. To know the percentage of age, sex, and organ/system-wise involvement of cancer patients attending a tertiary care centre in one year.

2. To study the distribution of organ-wise histopathological patterns being reported in a tertiary care centre in one year.

3. To study the cause and association of the most common histopathological patterns in each organ/system in one

MATERIALS AND METHODS: The present study was a one-year retrospective study taking into account the records from the tumor registry for the year 2022.The study comprised 495 patients visiting the Pathology department for biopsy examination. Out of total 495 cases in 2022 (January to December), 416 cases turned out to be malignant.

RESULTS: Out of 416 patients, the majority of the patients were females than males, both in the age of 60-69 years (29%) involving the gastrointestinal tract (stomach followed by colon) and breast topping the cancer site.

CONCLUSION: The most prevalent histopathological subtype was squamous cell carcinoma followed by grade 2 invasive ductal carcinoma not otherwise specified. This will help and guide relevant support for strengthening efforts in improving cancer prevention and control.

Keywords: Spectrum, malignancies, histopathological patterns, cancer.

1. Introduction

Cancer continues to be the leading cause of mortality and morbidity throughout the world despite vast advancements in diagnostic and therapeutic aspects.[1] Genetic factors, lifestyle factors, environmental exposures and certain viral infections remain the important cause for increasing incidence of cancer. Recent GLOBOCAN data projects cancer incidence to be 1.3 million and mortality to be 0.8 million in India.[2] Large epidemiological studies, population board cancer registers along with hospital board cancer registers and national research centres like ICMR have analysed various demographic patterns in cancer throughout the country.[10] The present study is done to assess the impact of cancer and we hope it will guide relevant support activities for an earlier diagnosis, cancer control, prevention and awareness among the people.

2238

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

2. Materials and Methods

The present study is a one-year retrospective study conducted in a tertiary care centre in South India. The data was taken from the tumour registry from January 2022 to December 2022. Histopathologically confirmed malignancy cases were included in this study. Tumors with unknown primary sites and cytologically diagnosed cases were excluded from the study. All the demographic details, type of specimen, gross and histopathological findings including immunohistochemical reports, if done any, were collected and analysed.

3. Results

Out of 8321 biopsies received 416 were diagnosed to be malignant (4.99 %). Of these 174 (41.82%) cases were males and 242 (58.18%) cases were females with male: female ratio standing at 0.72:1. Mean age of presentation for males is 57.77±14.11 years and for females is 52.64±13.92 years. Most cancers in males belong to 60-69 yrs of age (32%) (Bar chart 1) and in females its 50-59 yrs (29%) (Figure 1).
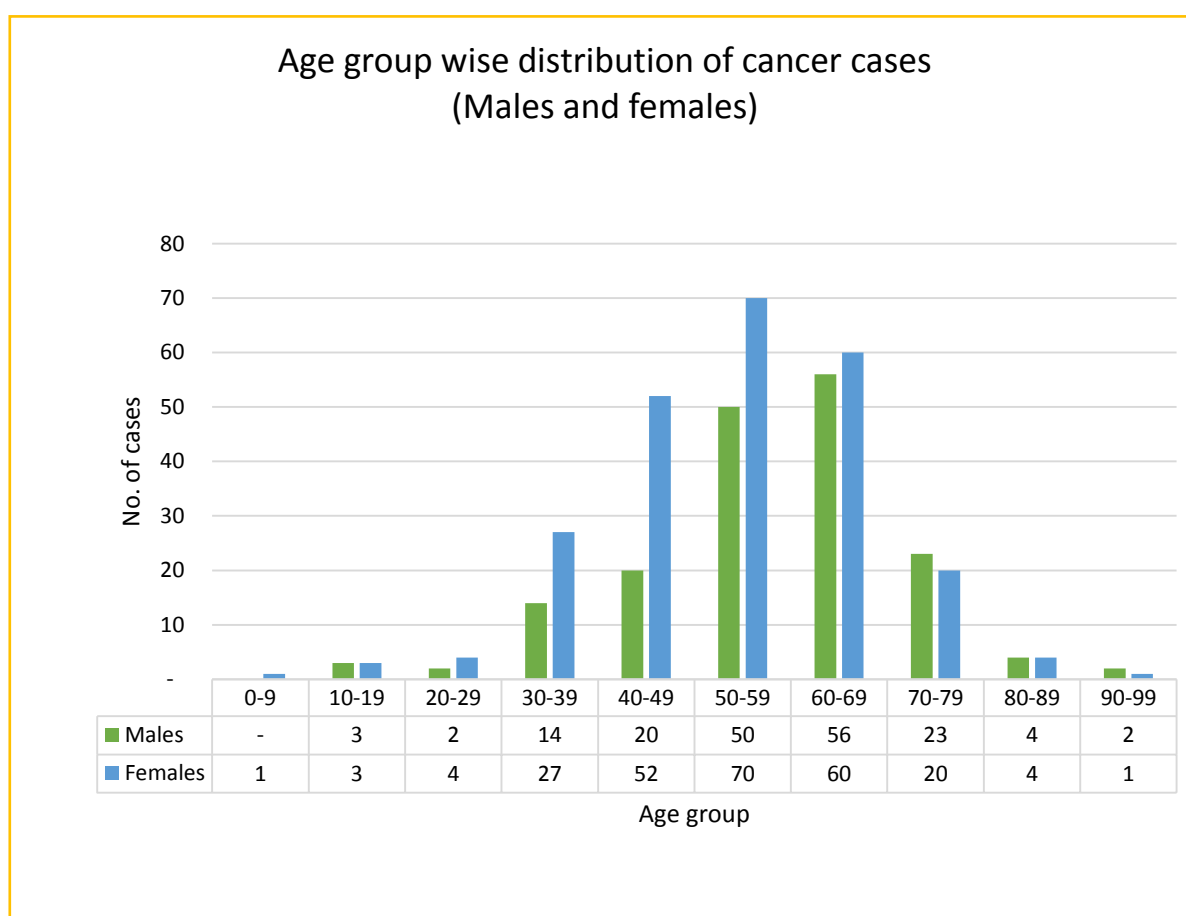

Age group wise distribution of cancer cases (Males and females)

Age group	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Males	-	3	2	14	20	50	56	23	4	2
Females	1	3	4	27	52	70	60	20	4	1

Figure 1: Age group distribution covering both sexes.

The most common malignancy reported were those from the gastrointestinal tract (139 cases,33.41%) and breast (77 cases, 18.51%). The least cases were reported from the peripheral nervous system (2 cases, 0.48%) (Figure 2)
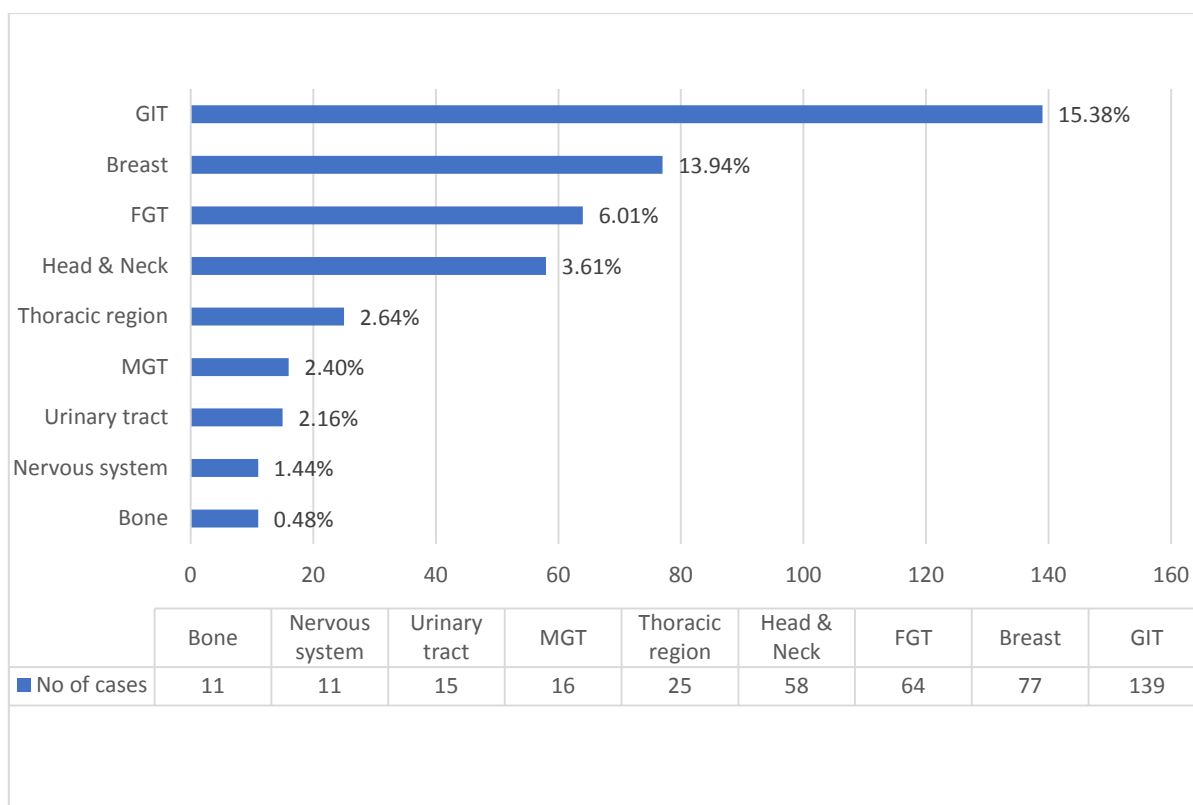
2239

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

	Bone	Nervous system	Urinary tract	MGT	Thoracic region	Head & Neck	FGT	Breast	GIT
No of cases	11	11	15	16	25	58	64	77	139

Figure 2 : Site wise distribution of tumor case (both sexes)

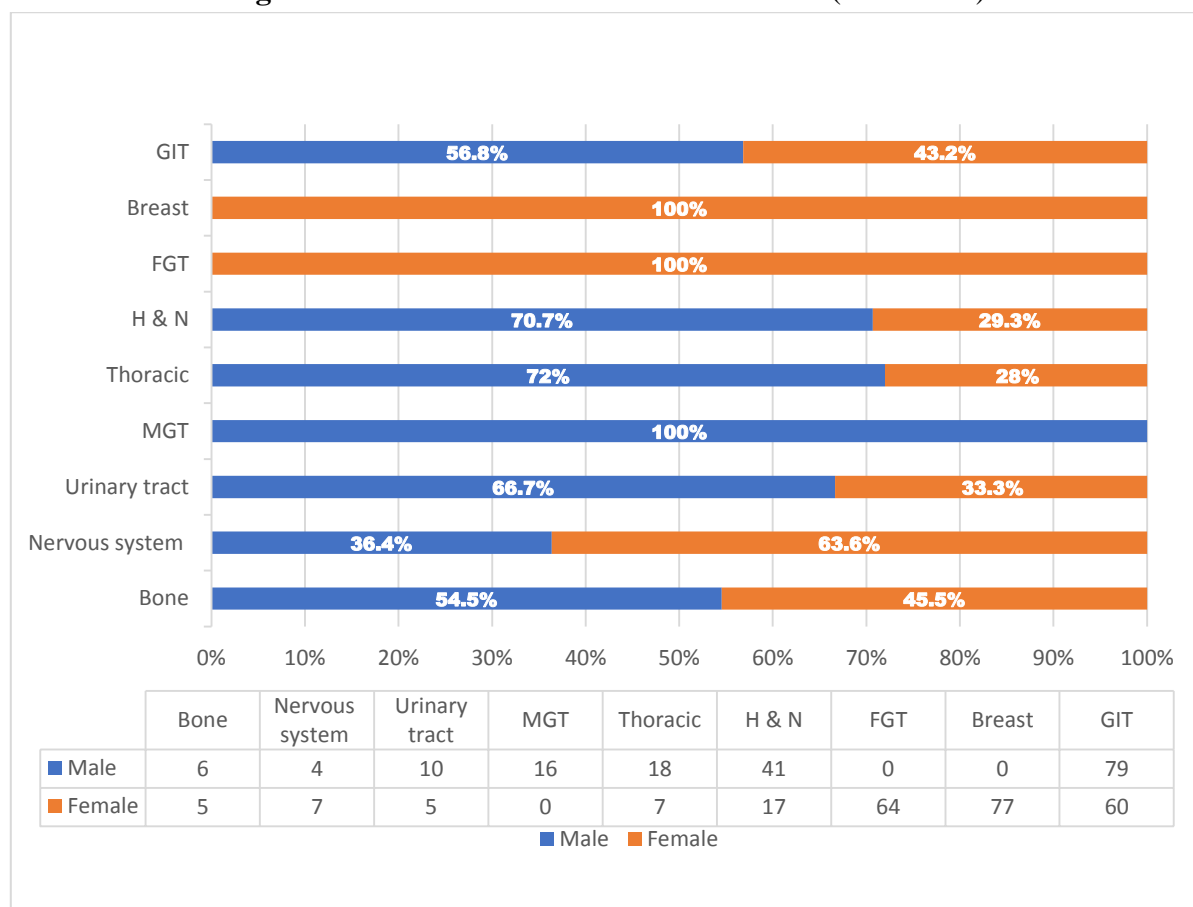|	Bone	Nervous system	Urinary tract	MGT	Thoracic	H & N	FGT	Breast	GIT
Male	6	4	10	16	18	41	0	0	79
Female	5	7	5	0	7	17	64	77	60

Figure 3: Sex wise distribution of tumor cases

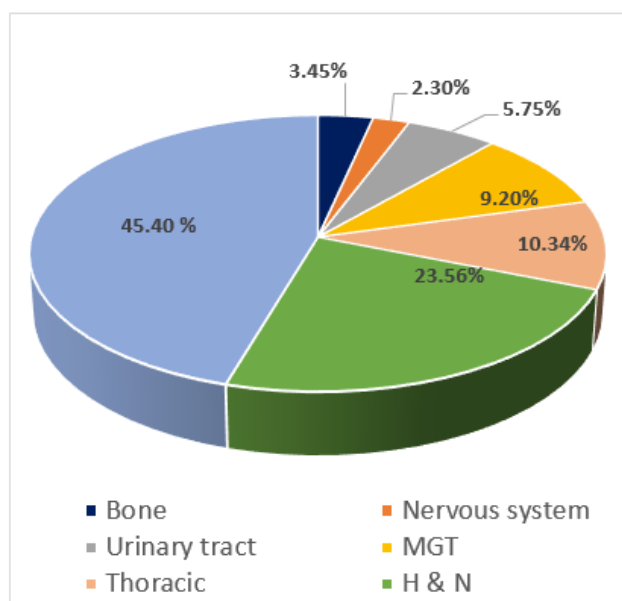Sex wise and site wise distribution of tumors is given in the figures 3, 4 and 5 respectively.

2240

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

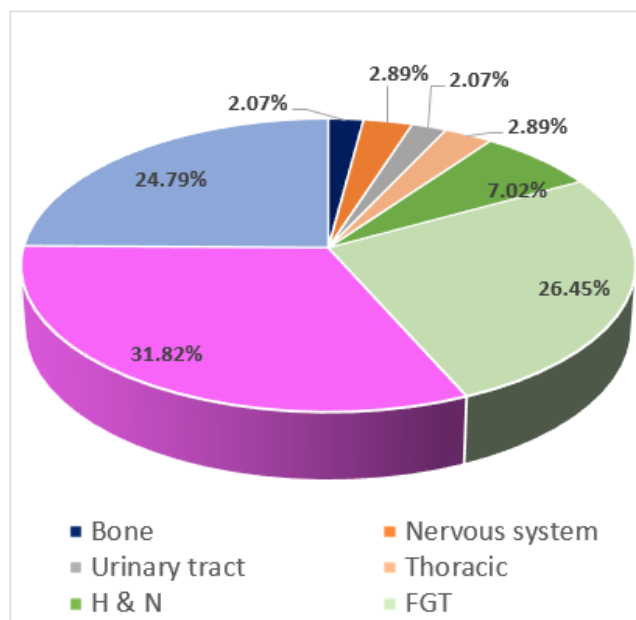**Figure 4:** Site wise prevalence of tumors in males

Figure 5: Site wise prevalence of tumors in females

Tumors of Gastrointestinal Tract

Malignancy of the gastrointestinal system is the overall most common malignancy (139 cases, 33.14%) with Gastric tumors being the most common subsite (53 cases, 38.13%) followed by colon (41 cases, 29.49%) and esophagus (16 cases, 11.51%). About 83.45 % of cases were adenocarcinoma with moderately differentiated grade being the most common histological grade (47.76%). About 18 cases (12.94%) were squamous cell carcinoma, most commonly from the esophagus (13 cases, 72%). Three cases of GIST have been reported during the study period(2 from the colon and 1 from the small bowel). One rare case of synchronous primary esophageal and primary gastric carcinoma has also been reported.Table 1 describes the distribution of the tumors among various subsites in the GIT.

Table 1: Distribution of the tumors among various subsites in the GIT

Subsite GIT	Histological type	Number of cases	Total no of cases
Esophaeal	Sq. cell ca	13 (81.25%)	16 (11.51%)
	Adeno ca	3(18.75%)	
OG junction	Adeno ca	6 (100%)	6 (4.31%)
Synchronous gastric and oseophageal carcinoma	Adeno and squamous ca	1 (100%)	1 (0.72%)
Gastric	Adeno ca	53 (100%)	53 (38.13%)
Small Intestine	Adeno ca	2 (50%)	4 (2.87%
	Adeno sq ca	1 (25%)	
	GIST	1 (25%)	
Colon	Adeno	39 (95.12%)	41 (29.49%)
	GIST	2 (4.88%)	
Sigmoid	Adeno	1 (100%)	1 (0.72%)
Anus	Sq. cell ca	5 (71.43%)	7 (5.03%)
	Adeno ca	2 (28.57%)	
Omental deposits	Adeno ca	10 (100%)	10 (7.19%)
TOTAL			139(100%)

Breast Cancer Histopathology Pattern

Breast cancer stands second with 77 cases out of which 48 cases (62.23%) are right-sided, 29 cases (37.67%) are left-sided and the most common presenting age group was 50 to 59 years. Invasive ductal carcinoma NOS was the most common histological type (74 cases, 96.10%) with Grade 2 being the most common histological grade. Table 2 describes the distribution of various histological subtypes of breast carcinoma during the study period and figure 6 shows the age-wise distribution of breast cancers.

Table 2: Distribution of the various histological types of breast cancer

HISTOLOGICAL TYPE			No of cases
IDC - NOS	Grade 1	13 (17.56%)	74 (96.10%)
	Grade 2	51 (68.91%)	
	Grade 3	10 (13.51%)	
Invasive carcinoma with medullary featues			2 (2.59%)
Invasive papillary carcinoma			1 (1.30%)
TOTAL			77 (100%)

2242

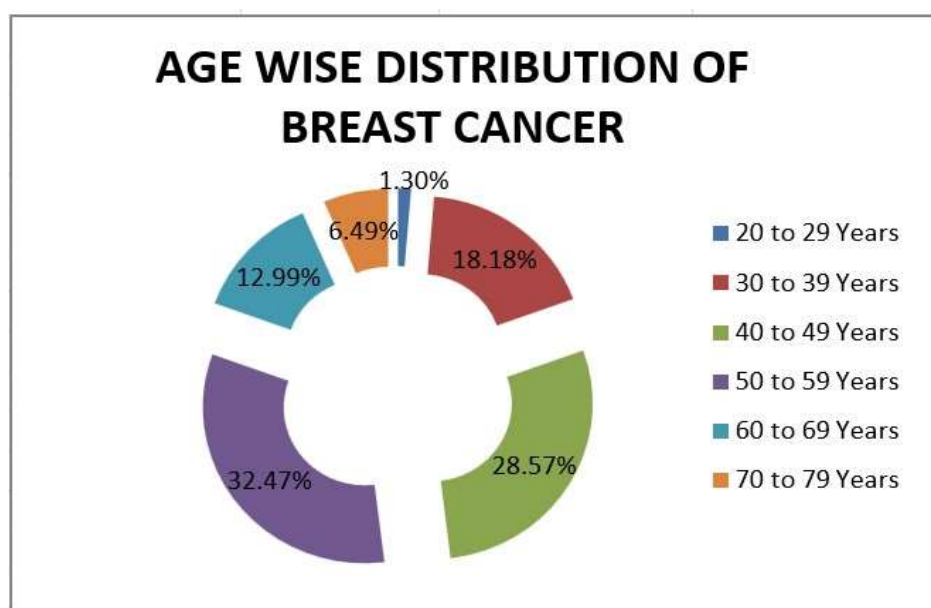Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 –2251

Figure 6: Age-wise distribution of breast carcinoma

Female Genital Tract

Tumors of the female genital tract constitute the third most common malignancy in the study population. Out of 64 tumors of the female genital tract, the cervix was the most common site (31 cases,48.43%) with moderately differentiated squamous cell carcinoma being the most common histological type, Followed by ovarian tumors (16 cases, 25%) and Endometrial tumors (12 cases, 18.75%). Vault growth and vaginal cancer constitute about 4.68% and 1.56% respectively. One case of vulval carcinoma was also reported. Table 3 describes the distribution of the tumors in female genital tract.

Table 3: Distribution of the various tumors in FGT

Subsite	Histological type		No of cases	Total no of cases
Cervix	Sq cell ca	well	2 (6.4%)	31 (48.43%)
		mod	27 (87.2%)	
		poor	2 (6.4%)	
Endometrium	Endometriod		8 (66.67%)	12 (18.75%)
	Endometriod wth sq diff		1 (8.33%)	
	Serous carcinoma		1 (8.33%)	
	Papillary carcinoma		1 (8.33%)	
	Endometrial stromal sarcoma		1 (8.33%)	
Ovary	Serous carcinoma		6 (37.50%)	16 (25%)
	Mucinous carcinoma		2 (12.50%)	
	MMGCT		3 (18.75%)	
	Transitional cell tumor		1 (6.25%)	
	Mucinous borderline		1 (6.25%)	
	Clear cell		1 (6.25%)	

2243

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 –2251

Subsite	Histological type	No of cases	Total no of cases
	Endometroid	1 (6.25%)	
	Mets	1 (6.25%)	
Vaginal	Sq cell ca	1 (100%)	1(1.56%)
Vault growth	Adeno ca	2 (66.67%)	3 (4.68%)
	Sq cell ca	1 (33.33%)	
Vulva	Sq cell ca	1 (100%)	1(1.56%)
TOTAL			64 (100%)

Head and Neck Cancers

The fourth common organ system involved was the head and neck (58 cases, 14%). The most common site of the primary tumor the in head and neck was the tongue (16 cases, 27.58%) with grade 2 (moderately differentiated) as the predominant type of differentiation. The next common site is the buccal mucosa (14 cases, 24.14%), most of them were well differentiated. Table 4 describes the distribution of the tumors in various subsites of the head and neck.

Table 4: Distribution of the various tumors of the head and neck

Subsite		Histological type		No of cases	Total no of cases
Tongue		Sq cell ca	Well diff	6 (37.5%)	16 (27.58%)
			Mod. diff	10 (62.5%)	
			Poor diff	0	
Pharynx		Sq cell ca	Well diff	1 (16.67%)	6 (10.34%)
			Mod. diff	3 (50%)	
			Poor diff	2 (33.33%)	
Buccal		Sq cell ca	Well diff	11 (78.57%)	14 (24.14%)
			Mod. diff	3 (21.42%)	
			Poor diff	0	
Larynx	Epiglottis	Sq cell ca	Mod. diff	1 (100%)	1 (1.72%)
	Pyriform fossa	Sq cell ca	Well diff	0	4 (6.90%)
			Mod. diff	3 (75%)	
			Poor diff	1 (25%)	
	Areyepiglottic	Sq cell ca	Mod. diff	1 (100%)	1 (1.72%)
	Supra glottis	Sq cell ca	Well diff	1 (50%)	2 (3.44%)
			Mod. diff	1 (50%)	
	Vocal cord	Sq cell ca	Well diff	1 (50%)	2 (3.44%)
			Mod. diff	1 (50%)	
			Poor diff	0	
	Post cricoid	Sq cell ca	Mod. diff	1 (100%)	1 (1.72%)
Tonsil		Sq cell ca	Mod. diff	1 (50%)	2 (3.44%)

2244

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

Subsite	Histological type		No of cases	Total no of cases
		Poor diff	1 (50%)	
Nose	Spindle cell neoplasm		1 (100%)	1 (1.72%)
Salivary gland	Adenoid cystic ca		1 (50%)	2 (3.44%)
	Salivary duct ca		1 (50%)	
Alveolar	Sq cell ca	Well diff	1 (100%)	1 (1.72%)
Sphenoid	Adeno ca mets		1 (100%)	1 (1.72%)
Scalp	Melanoma		1 (100%)	1 (1.72%)
Palate	Sq cell ca	Mod. diff	2 (66.67%)	3 (5.17%)
	Verrucous ca		1 (33.33%)	
TOTAL				58 (100%)

Tumors of Thoracic Region

Among the tumors in the thoracic region (25 cases, 6.01%), lung tumors were the most common (22 cases, 88%) with non-small cell carcinoma constituting about 86.36%. Among the non-small cell carcinoma, adenocarcinomas were the most common histological type (63.63%). Table 5 describes the distribution of the tumors in the thoracic region.

Table 5: Distribution of the various tumors in the Thoracic region

Subsite	Histological type		No of cases	Total no of cases
Lung	Small cell ca		3 (13.63%)	22 (88%)
	Non small cell ca	Adeno ca	14 (63.63%)	
		Sq cell ca	5 (22.72%)	
Thymus	Thymoma		1 (100%)	1 (4%)
Parasternal mass	Adenocarcinoma		1 (100%)	1 (4%)
Chest wall	Metastatic adeno carinoma		1 (100%)	1 (4%)
TOTAL				25 (100%)

Tumors of the Nervous System:

The nervous system is broadly classified as central and peripheral nervous system. The central nervous system constitutes about 81.81% of tumors of the nervous system with supratentorial tumors being the common site (Table 6). Histologically central nervous system tumors were graded from grade 1 to grade 4. Grade 4 tumors were the most common in our study population, with glioblastoma being the most common. One case of metastatic deposit in the brain was reported during the study period (Table 7). Both the peripheral nervous system tumors were spindle cell neoplasm (MPNST -1, Low-grade spindle cell sarcoma -1).

Table 6: Distribution of the various tumors in the nervous system

Subsite	No of cases	Total no of cases

CNS	Supratentorial	Temporoparietal	1 (16.66%)	6 (54.55%)
		Parietal	1 (16.66%)	
		Frontal	2 (33.33%)	
		Fronto parietal	1 (16.66%)	
		Fronto temporal	1 (16.66%)	
	Infratentorial	Cerebellar	1 (33.33%)	3 (27.27%)
		CP angle	1 (33.33%)	
		Midbrain	1 (33.33%)	
Peripheral nervous system				2 (18.18%)
TOTAL				11 (100%)

Table 7: Grade wise distribution of the central nervous system

Histological type	No of cases	
Grade 1	1	Transitional meningioma-1
Grade 2	2	Oligodendroglioma -1, Astrocytoma -1
Grade 3	Nil	
Grade 4	5	Glioblastoma -4, Medulloblastoma-1
Metastatic tumor	1	Adenocarcinoma deposits-1

Male Genital Tract

Out of 16 tumors of the male genital tract, 7 cases (43.75%) were from the penis, 6 cases (37.5%) from the prostate and 3 (18.75%) were from the testis. Squamous cell carcinoma was the common histological type in the penis (85.71%) and the mixed germ cell tumor histological type in the testis (67.67%) (Table 8).

Table 8: Distribution of the various tumors in the MGT

Subsite	**Histological type**	**No of cases**	**Total no of cases**
Penis	Sq cell ca	6 (85.71%)	7 (43.75%)
	Verrucous ca	1 (14.29%)	
Prostate	Adenocarcinoma	6(100%)	6 (37.5%)
Testis	Seminoma	1 (33.33%)	3 (18.75%)
	Mixed germ cell tumor	2 (67.67%)	
TOTAL			16(100%)

Bone Tumours

Out of 11 bone tumours, 7 were from the vertebral body of which two are primary (one is multiple myeloma and the other is plasmacytoma) whereas others are metastatic deposits. Two primary bone tumors are from the mandible (plexiform ameloblastoma). Two tumors are noted in the femur. (chondrosarcoma -1, metastatic deposit-1).

Tumours of Urinary Tract

Out of 15 tumors of the urinary tract, 8 (53.33%) tumors were from the urinary bladder with papillary urothelial carcinoma being the most common histological type (62.5%). 6 tumors

2246

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

(40%) were from the kidney with clear cell renal cell carcinoma being the predominant type (83.33%) kidney. One case of embryonal rhabdomyosarcoma in the urethra was reported during the study period. Table 9 shows the various tumors in the urinary tract.

Table 9: Distribution of the various tumors in the urinary tract

Subsite	Histological type	No of cases	Total no of cases
Bladder	Papillary uro. ca	5 (62.5%)	8 (53.33%)
	Sq cell ca	2 (25%)	
	Poorly diff ca	1 (12.5%	
Kidney	Clear cell RCC	5 (83.33%)	6 (40%)
	Papillary RCC	1 (16.67%	
Urethra	Embryonal RMS	1 (100%)	1 (6.67%)
TOTAL			15(100%)

4. Discussion

Demographic pattern of cancer varies throughout the world and India being a diversified country the patterns and incidence of cancer may vary from region to region. The mortality due to infectious diseases surpasses cancer in developing countries thereby making it the second cause compared to developed countries. According to GLOBOCON 2020, in India higher incidence rate for malignancy is higher in females (102.34/100,000 females) than in males (90.09/100,000 males).[12] In our study similar incidence pattern was noted with a higher number of cases in females (242/416 cases, 58.2%) in comparison with males (174/416 cases) (41.8%) This is in alignment with various studies Rana et al, Bal et al and Aggrawal et al.[1,5,11] whereas Sandhya et al reported a higher incidence of males in Andhra Pradesh.[4.

In our study, cancer most commonly occurs in the female age group was $50 - 59$ years (29%) followed by $60 - 69$ years (25%) which is quite similar to Bal et al.[5] Overall the most common malignancy in females was breast cancer(32%) followed by tumors of the female genital tract (26%). Out of which 48.43% were carcinoma of the cervix and 25% cases were from ovaries. This statistic is in concordance with GLOBONCON 2020.[12] In males, the leading cancer type was tumors of the gastrointestinal tract (79 cases, 45.4%)followed by Head and neck cancers (41 out of 174 cases = 23.6%) and cancers of the respiratory tract (19 out of 174 cases = 11%)

Tumors of GIT were the overall most common malignancy in our study with males contributing 56.8% of the cases. Gastric carcinoma was the most common GIT malignancy (53/139 cases, 38.13%) followed by colonic malignancies (41/139 cases, 29.49%) which is in concordance with the study done by Rana S.[13] Adenocarcinoma was the most common histological type of malignancy in GIT.

Breast carcinoma is the most common malignancy in females. The incidence of breast carcinoma is highest among 50-59 years (32.47%) and the incidence increases to 61% among 40-59 years. Invasive ductal carcinoma no specific type is the most common histological type. So, early screening for breast carcinoma from the age of 35-40 years will help to reduce the number of deaths from breast cancer.

2247

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

Tumors of the female genital tract were the second most common malignancy in females with cervical carcinoma being the most common among them. Squamous cell carcinoma is the most common histological type of cervical cancer. Kumari A et al also observed a similar pattern in their study.[14]

Malignancy of the tongue (27.58%) and buccal mucosa (24.14%) were the common malignancy in the head and neck region with males being the most common sex affected. This might be due to increased consumption of spicy food, tobacco, alcohol and betel nut amongst males which is also an important reason for an increased incidence of GIT malignancies in males.

Lung tumors were the most common malignancy in the thoracic region (22/25 cases, 88%) with adenocarcinoma being the most common histological type. Males were the predominant sex affected. Studies have shown that adenocarcinoma is slowly increasing in incidence and it is replacing the squamous cell carcinoma to become the most common type[15,16]. Our study had similar findings.

In our study, supratentorial tumors constitute about 54.54% of CNS tumors. Glioblastoma (WHO Grade 4) was the most common CNS tumor in our study (55.5%). Penile squamous cell carcinoma and prostatic adenocarcinoma were the most common male genital tract tumors. Jain VK et al also observed a similar trend.[17] Metastatic tumors of bone constitute about 45.45% of bone tumor cases.

Bladder carcinoma was the most common Urinary system malignancy contributing to about 53.33% of cases with papillary urothelial carcinoma being the common histological type. Renal cell carcinoma constitutes about 40% of the cases.

We have compared out study statistics with Unni Xavier et al, Rana et al, Aakansha Shukla et al studies and the results are tabulated below.

Table 10: Comparison with other studies

CRITERIA	Our study	UNNI XAVIER ET AL STUDY	RANA ET AL STUDY	AAKANSHA SHUKLA ET AL STUDY
TYPE OF STUDY	One year retrospective study	One year cross sectional study	Three years retrospective study	One year retrospective study
Total no of cases	495		2495	23705
No of cancer cases	416	381	2088	4698
Male patients	174 (41.8%)	154 (40.4%)	40%	1965 (41.82%)
Female patients	242 (58.17%)	227 (59.6%)	60%	2733 (58.17%)
Most common age group in males	60-69 yrs (28.74%)	60 -69 yrs (50.6%)	61-70 yrs (26.8%)	45-60 yrs (47.5%)
Most common	50-59 yrs	50-59	51-60 yrs	45-60 yrs

2248

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251

age group in females	(28.93%)	yrs(28.2%)	(26.91%)	(46.5%).
Cancer trend in males	GIT - 45.4% HEAD AND NECK - 23.56 LUNG -10.34%	liver - 27.3% Prostate - 12.3% Stomach - 11.7% Lungs- 9.7%	Head & neck cancer -37.5% GIT cancer - 15.02% Esophageal cancer - 12.86% Genitourinary tract cancer - 9.01%	Head and neck cancer- 19% GIT- 11.5%
Cancer trend in females	Breast-31.82% FGT-26.03% GIT-24.79%	Breast-21.3% Cervix -8.8% Ovary-8.4% Thyroid - 7.9%	Breast- 24.7% FGT -18.9%	FGT-10.9% Breast 10.49%
Most common cancer (males)	GIT tumors	Liver/bile duct cancer	squamous cell carcinoma	Squamous cell carcinoma
Most common cancer (females)	Breast cancer	Breast cancer	infiltrating ductal cell carcinoma	Infiltrating ductal carcinoma, NST

5. Limitations

This study was done for a period of one year and was done in tertiary care centre. Full data from cancer patients pertaining to follow up and the outcome could not be retrieved because of the one-year period.

6. Conclusion

In our study, the incidence of malignancy is higher in females than in males, with breast and cervical cancer. This raised increase is partly due to active screening programmes and awareness among the female population. Gastrointestinal malignancies are on the rise among the Indian population because of the westernization of food and lifestyle habits. Though awareness through camps, tobacco control programmes, and various other modalities have been given, still people are reluctant to come forward to get screened for such malignancies. Primordial prevention, early screening and early treatment are the only steps to reduce the morbidity and mortality of this non-communicable disease. We believe that this study will throw some light on the current trend of malignancies in this part of the country.

Additional Information:
Disclosures:
Animal subjects:
All authors have confirmed that this study did not involve animal subjects or tissue.
Conflicts of interest:

The authors declare no conflict of interest.

References

[1]   Current Trends of Carcinoma: Experience of a Tertiary Care Cancer Center in North India Manjit K. Rana et al

[2]   Spectrum of Cancer Burden in a Tertiary Care Hospital: A Retrospective one year Study Authors Dr Aakansha Shukla, Dr Ashmeet Kaur, Dr Kusum Mathur

[3]   Profile of cancer patients attending a tertiary care center Unni Xavier et al

[4]   Sandhya MP, Shanthi M, Fareed N, Sudhir KM, Krishnakumar R: Retrospective analysis of hospital records at a cancer Institute in Nellore district, Andhra Pradesh. J Indian Assoc Public Health Dent. 2011, 9:161-6.

[5]   Bal MS, Bodal VK, Kaur J, Kaur M, Sharma S: Patterns of cancer: a study of 500 Punjabi patients . Asian Pac J Cancer Prev. 2015, 16:5107-10. 10.7314/apjcp.2015.16.12.5107

[6]   Thakur JS, Rao BT, Rajwanshi A, Parwana HK, Kumar R: Epidemiological study of high cancer among rural agricultural community of Punjab in Northern India. Int J Environ Res Public Health. 2008, 5:399-407. 10.3390/ijerph5050399

[7]   Aggarwal R, Manuja, Aditya K, Singh GP: Pattern of cancer in a tertiary care hospital in Malwa region of Punjab, in comparison to other regions in India. J Clin Diagn Res. 2015, 9:XC05-7. 10.7860/JCDR/2015/11171.5685

[8]   Nagai H, Kim YH: Cancer prevention from the perspective of global cancer burden patterns . J Thorac Dis. 2017, 9:448-51. 10.21037/jtd.2017.02.75

[9]   Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D: Global cancer statistics. CA Cancer J Clin. 2011, 61:69-90. 10.3322/caac.20107 3. Bal MS, Bodal VK, Kaur J, Kaur M, Sharma S: Patterns of cancer: a study of 500 Punjabi patients . Asian Pac J Cancer Prev. 2015, 16:5107-10. 10.7314/apjcp.2015.16.12.5107

[10]   Mallath MK, Taylor DG, Badwe RA, et al.: The growing burden of cancer in India: epidemiology and social context. Lancet Oncol. 2014, 15:e205-12. 10.1016/S1470-2045(14)70115-9 5.

[11]   Aggarwal R, Manuja, Aditya K, Singh GP: Pattern of cancer in a tertiary care hospital in Malwa region of Punjab, in comparison to other regions in India. J Clin Diagn Res. 2015, 9:XC05-7. 10.7860/JCDR/2015/11171.5685

[12]   Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2021 May;71(3):209-49.

[13]   Rana S: Prevalence of gastrointestinal cancers in India. Multi-Targeted Approach to Treatment of Cancer. Gandhi V, Mehta K, Grover R, Pathak S, Aggarwal BB (ed): Springer, New York; 2015. 217-31.

[14]   Kumari A, Pankaj S, Choudhary V, Kumari A, Nazneen S, Kumari J, Kumar S: Retrospective analysis of patients of cervical cancer a tertiary center in Bihar. Indian J Cancer. 2018, 55:70-3. 10.4103/ijc.IJC_482_17.

[15]   Nakamura H, Saji H: Worldwide trend of increasing primary adenocarcinoma of the lung. Surg Today. 2014, 44:1004-12. 10.1007/s00595-013-0636.

2250

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 –2251

[16]   Mohan A, Latifi AN, Guleria R: Increasing incidence of adenocarcinoma lung in India: following the global trend?. Indian J Cancer. 2016, 53:92-5. 10.4103/0019-509X.180819.

[17]   Jain VK, Khare V, Tantuway R: Study of incidence of carcinoma prostate in central India with reference to Gleason's grading. Int J Med Res Rev. 2013, 1:10.17511/ijmrr.2013.i04.05.

2251

Eur. Chem. Bull. 2023, 12(Special Issue 4), 2238 −2251