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Original Article

The Spectrum of Malignant Tumours at a Tertiary Care Hospital in Rawalpindi

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ABSTRACT

Objective: To determine the frequency of malignant tumors seen in our practice and to provide a foundation for building a comprehensive cancer care strategy.

Study Design: Cross-sectional study.

Place and Duration of Study: Histopathology Department, Armed Forces Institute of Pathology Rawalpindi, Pakistan from 2009 to 2018.

Methodology: All malignant tumors reported from 2009-2018 were retrieved from our tumor registry. This data was analyzed for overall frequency gender distribution, age groups and type/site relationship. Present data was also compared with recent and previous such analyses done both nationally and worldwide, in similar settings and demographics.

Results: Total 37793 malignant tumors were diagnosed and registered. Out of this, 22077(58.4%) were males and 15716(41.5%) were females. The most common cancer reported was breast (14.3%) followed by urinary bladder (8.7%), oral (6.7%), lymph nodular (5.5%) and prostatic (5.3%). Malignant tumors in pediatric age group (0-14 years) were found to be 3.4%. Most malignancies were reported in 6th decade of life.

Conclusion: There was increase in the total number of the malignant tumors during 2009-2018, as compared to the previous 10 years' data. Male to female ratio was 1.4:1. The five most common sites in male were urinary bladder, prostate, skin, lymph nodes and oral cavity and pharynx. Whereas in females these were breast, skin, oral cavity, female genital organs (ovary) and lymph nodes.

Keywords: Breast Neoplasms, Neoplasms, Prostatic Neoplasms, Tumor Registry Data.

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INTRODUCTION

Cancer refers to a group of diseases characterized by the growth of abnormal cells beyond their usual boundaries that can invade adjoining parts of the body and/or spread to other organs.[1]

It is a major cause of morbidity and mortality, with approximately 14 million new cases and 8 million cancer-related deaths in 2012, affecting populations in all countries and regions. These estimates correspond to age-standardized incidence and mortality rates of 182 and 102 per 100 000, respectively.[2]

In the year 2016, WHO executive board recommended early diagnosis and accessible care for all cancer patients. This was followed by a resolution in May 2017. It included recommendations that cancer control strategies should aim to increase survival and reduce mortality in cancer patients.[3]

The global cancer burden is estimated to have risen to 18.1 million new cases and 9.6 million deaths in 2018. One in 5 men and one in 6 women worldwide develop cancer during their lifetime, and one in 8 men and one in 11 women die from the disease. Worldwide, the total number of people who are alive within 5 years of a cancer diagnosis, called the 5-year prevalence, is estimated to be 43.8 million. It is estimated to account for 9.6 million deaths in 2018, alone.[4]

According to Globacon 2018, in Pakistan total number of new cancer cases reported in 2018 was 173,937 and number of deaths 118,442. The total number of prevalent cases in past 5 years is 310,132. Out of these 5 most frequent cancers excluding non-melanoma skin cancer are of breast, lip, oral cavity, lung, esophagus and leukemia.[4]

Currently there are no national or proper provincial level population-based cancer registries in Pakistan. Therefore, prevalence and trends of cancer incidence is not known. Frequency-based cancer data is available only in the form of hospital and departmental based records at some centers. But there is no countrywide population-based cancer registry in Pakistan, which is why we chose to conduct this study.

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METHODOLOGY

In this Cross-Sectional study, data was retrieved from Armed Forces Institute of Pathology (AFIP) Rawalpindi, Pakistan's tumor registry after taking approval from Institutional Ethical Review Board (letter number FC-HSP-17-24/ READ-IRB/19/412) from 2009-2018.

Inclusion Criteria: Cancer patients of either gender and all age groups with fresh biopsies, which were received, processed, analyzed and reported by AFIP, all biopsies/ excision samples that were adequately fixed and labeled were included in the study. Biopsies received and reported for 2nd opinions from various centers were also included.

Exclusion Criteria: Patients without biopsies or those that had biopsies that were inadequately fixed with errors in labeling were excluded.

Diagnostic biopsies of all types from military and civil institutes from all over Pakistan were received, mainly from KPK, northern Punjab and Azad Jammu and Kashmir. All malignant cases reported were registered in tumor registry as per International Classification of Diseases (ICD) codes. Basic demographic data was taken on a request form, directly from treating physicians and patients. All the information was coded by numerical codes. Each tumor was assigned an ICD-O5 code published by the International Agency for Research on Cancer (IARC).

After coding each tumor, data was entered in Statistical Package for the Social Sciences (SPSS) version 26.00. and was analyzed for overall frequencies and percentages, as well as according to age and gender. Total malignant tumors were calculated for each year. Separate data analysis for males and females was done. Pediatric cases were also separated and analyzed according to age and gender. Further analysis was done to specify the data in terms of the commonest malignancies. Ten commonest malignant tumors were calculated for both males and females and pediatric age group patients. Analysis of tumors in different decades and comparison with other national and international / regional studies was also done.

RESULTS

During the ten-year study period (2009-2018) under study, a total of 37793 malignant tumors were diagnosed and registered in the tumour registry at AFIP. Out of these, 22077(58.4%) were males and 15716(41.5%) were female with an M:F ratio of 1.5:1. On average, 3780 malignant tumours were diagnosed annually. Overall, the most common site of malignancy was breast 5408(14.3%) followed by urinary bladder 3277 (8.7%), skin 2603(6.9%), oral cavity 2517 (6.7%), lymph nodes 2111(5.5%), prostate 2024 (5.3%), female genital organs 1586(4.2%), bronchus/lung 1389(3.7%), liver 1308(3.5%) and stomach 1259(3.3%), which can be seen in Table-I. Frequencies and percentages of tumors based on age group can be seen in Table-II. Tables II and IV show the most common tumours in each gender.

Table-I: Ten Most Common Tumour Sites (n=37793)

Site	n (%)
Breast	5408(14.3%)
Urinary Bladder	3277(8.7%)
Skin	2603(6.9%)
Oral cavity (including pharynx)	2517(6.7%)
Lymph node	2111(5.5%)
Prostate	2024(5.3%)
Female genital organs	1586(4.2%)
Bronchus and lung	1389(3.7%)
Liver	1308(3.5%)
Stomach	1259(3.3%)

Carcinoma breast was found to be the most common malignant tumor 5408(14.3%) reported at AFIP in the last one decade in both genders, with a male to female ratio of 1:36. The commonest histological diagnosis was invasive ductal carcinoma followed by invasive lobular carcinoma and some other rare types.

Hodgkin lymphoma and Non-Hodgkin Lymphoma were almost equally frequent, with 1020 (48.2%) cases of the latter and 1092(50.3%) cases of the former. Among non-Hodgkin lymphomas, diffuse large B-cell lymphoma (DLBCL), chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL) and follicular lymphoma were more frequent.

Female genital organ malignancies included uterus, cervix, vagina, uterine corpus, fallopian tubes and ovaries, with the most commonly involved site being the ovaries with 637 cases (40%). Serous cyst adenocarcinoma, endometrioid carcinoma, granulosa cell tumor, mucinous adenocarcinoma and germ cell tumor were also common.

Carcinoma of the lung and bronchi was the 8th most common tumor reported at AFIP. Histological diagnosis included mainly non-small cell carcinoma 955(68.7%) with only 185(13.3%) cases of small cell carcinoma.

Table-II: Frequency of Malignant Tumours in Different Decades of Life (n=37793)

Age group (years)	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+	Unknown
Male n(%)	546(63)	639(61)	1142(54)	1465(43)	2434(45)	4206(52.7)	5804(63.4)	4044(74)	1621(77)	175(52.3)
Female n(%)	317(36)	396(38)	939(45)	1940(56.9)	2966(54.9)	3769(47)	3349(36.5)	1417(25)	464(22)	159 (47.6)

Hepatic malignancies were at 9th number, with metastatic carcinoma being the most frequent diagnosis, followed by hepatocellular carcinoma and few cases of cholangiocarcinoma. Gastric malignancies were found to be the 10th most common malignant tumors at AFIP. Most frequent histological diagnosis was adenocarcinoma followed by Gastrointestinal Stromal Tumors (GIST) and Non-Hodgkin Lymphoma.

Table-III: Ten Commonest Malignant Tumour Sites in Males (n=22077)

Site	ICD-code	n(%)
Urinary Bladder	67.0-67.9	2922(13.2%)
Prostate	61.0-61.9	2024(9.1%)
Skin	44.0-44.9	1544(7.0%)
Lymph node	77.0-77.9	1505(6.9%)
Oral cavity (including pharynx)	00.0-14.9	1481 (6.7%)
Colorectum	18.0-20.9	1291 (5.9%)
Bronchus and lung	34.0-34.9	1140(5.16%)
Stomach	16.0-16.9	932(4.2%)
Liver	22.0-22.0	857(3.8%)
Bone	40.0-41.9	836(3.7 %)

*ICD: International Classification of Diseases

Table-IV: Ten Commonest Malignant Tumour sites in Females (n=15716)

Site	ICD-Code	n (%)
Breast	50.0-50.9	5264(33.4%)
Skin	44.0-44.9	1049(6.7%)
Oral cavity including pharynx	00.0-14.8	1039(6.6%)
Female genital organs (Ovary)	56.0-56.9	637(4.0%)
Lymph node	77.0-77.9	606(3.9%)
Colorectum	18.0-20.9	560(3.6%)
Liver	22.0-22.0	450(2.9%)
Bone	40.0-41.9	387(2.5%)
Urinary Bladder	67.0-67.9	355(2.2%)
Thyroid	73.0-73.9	345(2.2%)

**ICD: International Classification of Diseases*

DISCUSSION

The Armed Forces Institute of Pathology (AFIP) tumour registry is one of the largest and oldest institution-based tumour registries of Pakistan. The data presented here is in succession to the previous four publications from AFIP tumor registry.

There was an increase in the total number of patients registered for malignant tumours during the current ten-year data analysis as compared to our previous 10 year's data,[5,6] (n=37793 as compared to n=32718). Age distribution among tumors showed that now more malignant tumors were found in older age groups than the previous analysis. Male to female ratio in current inquiry was 1.4:1, which was same as depicted in the previous report from 2002-2011.[5-7]

Prostatic carcinoma was the second most reported among males over the past 10 years, which was the same as the report from 2002-2011,[6,7] though it had been much more infrequent in previous decades (1960-1988, 6.6%).[6-9] Similar trend was shown by Shaukat Khanum Tumor Registry (8.3%),[10] in the years between 1994 and 2017. There was an overall increase in prostatic carcinoma worldwide as per a WHO IARC Globocan 2020 report.[11]

Skin malignancies were third in our current analysis in males and a similar trend has always been depicted in all the previous publications of AFIP tumor registry.[6,7] Perusing local studies, skin malignancies were found to be common in northern parts of Pakistan as compared to the south. However, worldwide data does not show such a high number of skin malignancies.[11]

Lymph node malignancies were the fourth most common in the present study. There has been a gradual decline in their overall prevalence over the years, as per the previous three analyses,[12] of the AFIP tumour registry. Most lymphomas were reported in adults from Northern Pakistan. High prevalence was seen particularly in KPK according to PAEC 2019.[13]

Out of a total of 37793 malignant cases reported from AFIP, 15716(41.5%) were female. Breast was reported to be the most frequent malignant tumor among females in all the four series of AFIP tumor registry analyses,[6,7] as well as in all the national,[11] and international data.[10] The reason for this high prevalence seemed to be related to world globalization as well as changing lifestyles.[14,15] Keeping in view the

high percentage of prevalence, prompt and adequate screening tests is the need of the hour.

Malignancies of the oral cavity were the 3rd most common malignancy in females in our present analysis. These malignancies have shown a steep high trend in our current study as compared to previous analyses.[5-7] This higher prevalence is attributed to betel nut chewing and use of tobacco in our part of the world.[16-18]

Robust statistics on cancer occurrence and outcome are an essential prerequisite for national and regional programs for cancer control and for informing the cancer research agenda. It is hoped that this study will be an important step towards developing a comprehensive cancer registry in Pakistan.

CONCLUSION

There was increase in the total number of the malignant tumors during 2009-2018, as compared to the previous 10 years' data. Male to female ratio was 1.4:1. The five most common sites in male were urinary bladder, prostate, skin, lymph nodes and oral cavity and pharynx. Whereas in females these were breast, skin, oral cavity, female genital organs (ovary) and lymph nodes. These results were comparable to WHO cancer data (2014).

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The following authors have made substantial contributions to the manuscript as under:

MTK & BP: Data acquisition, critical review, approval of the final version to be published.

HUD & AA: Conception, study design, drafting the manuscript, approval of the final version to be published.

AA: Data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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