

**The pattern of Malignant Tumours: Tumour registry data analysis, AFIP, Rawalpindi, Pakistan (1992-2001)**

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**Abstract**

**Objective:** To provide information regarding frequency of malignant tumours through data retrieved from pathology based tumour registry of AFIP, Rawalpindi, Pakistan.

**Methods:** All malignant tumours recorded with the AFIP tumour registry over a period of 10 years (1992-2001) were analysed in terms of age group, gender and type of tumour with relation to site. A comparison with the previously published material from same setting, national and international studies were also done.

**Results:** The total malignant tumours in the 10 years period were 21,168. Out of these, 12584 (59.5%) were seen in male patients while 8584 (40.5%) were in females. Total malignant tumours in pediatric age group were 927 (4.4%). The common malignant tumours in males in order of decreasing frequency were, those of prostate, skin, lymph node, leukaemia, urinary bladder, colorectum, bone, lung, stomach and liver. In females, breast carcinoma was on top followed by skin, leukaemia, ovary, coloretum, lymph node, bone, liver, cervix and gall bladder. In females, contrary to the Western studies and India, ovarian tumours were more frequent than cervical cancers. Comparison of this analysis with our previous analysis, national and international studies showed some interesting features.

**Conclusion:** It was found that in males, tumours of the prostate were the most frequent as compared to the previous study, which showed lymphomas and leukemias to be the most common. On the other hand in females, tumours of the breast remained to be consistently most frequent (JPMA 56:359;2006).

## Introduction

Data of patients suffering from various types of tumours can be recorded in a tumour registry that helps to store, analyse and interpret data. The population based cancer registries reflect the data based on unselected patients with a wide range of natural histories and treatment patterns. On the other hand an institution /hospital/pathology based cancer registry is an important public health tool that can be used to verify suspected cancer clusters, provide useful information for researchers and help physicians to determine the results of different cancer treatments.<sup>1</sup> Information regarding the geographical distribution of cancer is important to understand the type and etiology of cancers. In developed countries, this incidence is derived from population based statistics. However, in developing countries where such comprehensive data is not available, inference can be drawn from large-scale pathology-based cancer data.<sup>2</sup> In such data, the rates of incidence cannot be calculated, therefore the data is to be presented as relative frequency. This causes difficulties in the interpretation of such data but it is essential and indispensable in completing the global picture of cancer distribution. As half of the annual new cases of cancer occur in developing countries, it is estimated that death rate from cancer may rise three-fold by the year 2025 in these regions.<sup>3</sup> We present data collected over a ten years period (1992-2001) by the Armed Forces Tumour registry, located at Armed Forces Institute of Pathology (AFIP), Rawalpindi, Pakistan. This is not only a reference laboratory for Armed Forces but also receives large number of biopsies from civilian patients from northern part of Pakistan. This is one of the largest data of biopsy proven cases, reported from a single institution of Pakistan. The material is based on relative frequency data. It carries all the constraints inherent with such statistics. However, we are sure it will provide valuable basic information to plan further research in this field.

## Materials and Methods

The material was referred to Armed Forces Institute of Pathology, Rawalpindi from various military and civil Institutions. All histologically diagnosed malignant tumours were registered with tumour registry. Basic epidemiological data regarding each case was collected from the patient directly or from their attending doctors. The study included all malignant tumour cases diagnosed from January 1992 to December 2001. All the information was coded by a numerical code. Each tumour was assigned ICD-O code<sup>4</sup>,

published by International Agency for Research on cancer (IARC). The patients were divided into eight groups, according to their ages. After coding each tumour, data sheets were prepared so that further analysis could be done. Total malignant tumours were calculated in each year. These were then separated according to gender. Pediatric cases were also separated (< 15 years) according to age and sex.

## Results

In the ten-year study period (from 1992-2001), a total of 21,168 malignant tumours were analysed. On an average, each year 2100 tumours were registered. There were, 12,584 male and 8584 female patients. It was found that overall malignant tumours were more frequently diagnosed in males 12584 (59.5%) as compared to 8584 (40.5%) females. Male to female ratio was 1.5:1. Age distribution showed that the peak incidence was between 50-70 year age group, including about 40% of the total tumours.

Table-1 shows distribution of ten commonest malignant tumours in each sex. The most common tumours in males were of prostate whereas in females it was the breast.

All the malignant tumours were separated into adult and paediatric age groups, as it is known that malignancies differ in these age groups. Out of total 21,168 malignant tumours 922 (4.36%) cases were seen in paediatric age group (< 15 years). Among these there were 616 males, constituting 4.90% of all male malignancies and 66.81% of all paediatric malignancies. Female patients were 306, comprising 3.56% of all female cases and 33.19% of all paediatric malignancies. Male to female ratio was 2:1. In male pediatric age group, the most common tumours were lymphomas and leukaemias (26.33% and 24.07%) followed by tumours of bone and CNS (6.3% each) and eye tumours (4.84%).

Table 1. Ten commonest malignant tumours

S#	Males (n=12584)			Females (n= 8584)		
	Site	ICD-O	Percentage	Site	ICD-O	Percentage
1	Prostate	61	9.44	Breast	50	26.04
2	Skin	44	8.38	Skin	44	8.50
3	Lymph node	77	8.35	Leukaemia	42	4.91
4	Leukaemia	42	7.83	Ovary	56	4.78
5	Urinary Bladder	67	7.66	Colorectal	18-21	3.85
6	Colorectal	18-21	6.37	Lymph node	77	3.28
7	Bone	40-41	4.40	Bone	40-41	3.25
8	Lung	34	3.75	Liver	22	2.81
9	Stomach	16	3.24	Cervix	53	2.69
10	Liver	22	2.81	Gall bladder	23	2.49

**Table 2. Showing comparison with previous analysis of AFIP & national studies in males.<sup>5,13,19</sup>**

S#	AFIP(60-64)	AFIP(77-88)	Present study	KCR*	JPMC**	KEMC***
1	Lymph node	Lymph node	Prostate	Lung	Bronchus	Lymph node
2	Bronchus	Leukaemia	Skin	Oral cavity	Hypopharynx	Oral cavity
3	Colorectal	Bronchus	Lymph node	Larynx	Oral cavity	Bronchus
4	Skin	Skin	Leukaemia	Urinary bladder	Oesophagus	Larynx
5	Larynx	Prostate	Urinary bladder	Lymph node	Leukaemia	Skin

\* Karachi Cancer Registry \*\* Jinnah Postgraduate Medical Centre \*\*\* King Edward Medical College.

**Table 3. Showing comparison with previous analysis of AFIP and national studies in females<sup>5,13,19</sup>**

S#	AFIP (60-64)	AFIP (77-88)	Present study	KCR*	JPMC**	KEMC***
1	Breast	Breast	Breast	Breast	Breast	Breast
2	Cervix	Skin	Skin	Oral cavity	Oral cavity	Cervix
3	Colorectal	Ovary	Leukaemia	Ovary	Cervix	Ovary
4	Skin	Leukaemia	Ovary	Cervix	Oesophagus	Oral cavity
5	Lymph node	Cervix	Colorectal	Oesophagus	Hypopharynx	Lymph node

\* Karachi cancer registry \*\* Jinnah Postgraduate Medical Centre \*\*\* King Edward Medical College.

These five were followed by soft tissue, skin, kidney, colorectal and peritoneum. In the female pediatric age group, almost similar pattern was observed, and of course germ cells tumours of ovary were also in the ten common tumours. Table-2 and 3 show comparison with the previous studies of AFIP and other national studies. Comparison of five common tumours of both males and females in the present study, with the tumours in developed, less developed and south central Asian countries was also done.

## Discussion

It is said that environmental factors play a significant role in the causation of cancer, so it is important to know the pattern of cancer distribution in a specific geographical location. This large series gave us the opportunity, not only to highlight the pattern of malignant tumours in our set up but also to compare it with other regional and international data. There is no evidence of decreasing rate of any cancer from any site rather there is overall increase in the total number of cases as compared to analysis of the same duration before.

Among males, the tumours of the prostate were the most common tumours. The tumours of the prostate have increased in our male population and risen from ten commonest in 1960-64 to fifth in the study of 1977-88.<sup>5</sup> The reason for this increase is not clear. Probably developments of TURP (transurethral resection of prostate) technique and PSA (prostate specific antigen)

for screening general population are major factors. TURP is a safe and effective therapeutic option to relieve lower urinary tract obstruction due to benign lesions as well as advanced prostate cancer, therefore more and more transurethral prostatic biopsies are being submitted than before.<sup>10,11</sup> But this malignancy is not that frequent in other Pakistani studies<sup>7-9</sup>, whereas it is second common in the developed countries.<sup>12</sup> It was also found that leukaemias and lymphomas have declined from commonest malignancies of our previous study to the 3rd and 4th position in the present study.<sup>6</sup> Increase frequency of skin tumours is also evident in the present analysis. These tumours were not that common in the southern part of the country, where carcinoma lung and oral cavity were more frequent.<sup>7,8</sup> In a study from Quetta, carcinoma esophagus was reported as commonest, both in males and females<sup>9</sup>, but it does not feature among the first ten in our data.

On comparison with Karachi Cancer Registry (KCR) and JPMC Karachi, it was found that tumours of the lungs, oral cavity and larynx are the commonest in male patients whereas in the studies of Karachi, skin and lymph node tumours were common. This fact can be attributed to the factors like industrial and environmental pollution, increasing traffic, and extensive betel nut chewing. In a study of lung cancer in Karachi, use of tobacco was strongly suspected to be the causative agent.<sup>13</sup> Malignant tumours of the urinary bladder and colorectum were also fairly common. A significant number of colorectal tumours, cases were seen in younger age group.

Among females the malignant tumours of breast were the most frequent, as reported almost in all the centers in Pakistan.<sup>7,8,13</sup> Breast carcinomas were most commonly diagnosed in the 40-50 years age group. Internationally also, the most common malignancy in females is of breast, in both developed and less developed regions, while in south central Asian countries, cervical (uterine) tumours are reported to be most common followed by breast tumours.<sup>12</sup> This data also confirmed that both in developing and developed countries 1 in 10 of all new cancers, is

cancer of female breast.<sup>14</sup> In females, the tumours of the ovary were more frequent than cervix. This is probably due to low incidence of cervical cancer in our region. The occurrence of the cervical cancer is lower as compared to other Asian countries, particularly India and were similar to the Western Asian Muslim countries.<sup>15,16</sup>

Gall bladder carcinomas, have continued to show high frequency during the years and remained in the ten commonest tumours. The high prevalence of gallstones could be the major etiological factor.<sup>17</sup> In majority of our cases the malignancy was not suspected preoperatively. The tumours of colorectal region, bone and lymph nodes, as in male were also quite frequent in females.

Liver malignancies, in both sexes were also seen in the ten commonest tumours in the current study, which were not present in our previous two analyses.<sup>5,6</sup> Chronic liver diseases including hepatitis B and C are very frequent in this part of the world and may be a contributing factor.

Leukaemias and lymphomas constitute nearly half of all paediatric malignancies. This proportion is more than what is seen in Karachi.<sup>18</sup> The peak incidence of lymphoma and leukaemia was in 5-9 years age group. The incidence of CNS and bone tumours showed gradual rise with peak in the 10-14 years age group.

In conclusion, this pathology based analysis and its comparison with the national and international studies not only confirms some generally known facts like high prevalence of breast carcinoma in females but it also points out that certain tumours may be more common in this region. There is a great deficiency in Pakistan regarding population based tumour registries, the importance of which is well known.

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