

FREQUENCY OF PRIMARY SOLID MALIGNANT NEOPLASMS IN DIFFERENT AGE GROUPS AS SEEN IN OUR PRACTICE

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Background: To determine in a large series of surgical biopsies, the frequency of various histologic types of primary solid malignant neoplasms in males and females in different age groups. **Methods:** A retrospective study of 20,000 consecutive surgical biopsies reported in the section of histopathology, AKU in 2004. **Results:** Malignant neoplasms are commonest in the fifth and sixth decades of life. The commonest malignant neoplasms in the first decade were Hodgkin's lymphoma and Wilm's tumor in males and females respectively. In the second decade, osteosarcoma in males and Ewing's sarcoma / PNET in females. In the third decade, colorectal adenocarcinoma in males and infiltrating Ductal carcinoma of breast in females. In the fourth decade, squamous cell carcinoma of oral cavity in males and infiltrating ductal carcinoma of breast in females. In the fifth decade squamous cell carcinoma of oral cavity in males and infiltrating ductal carcinoma of breast in females. In sixth decade, squamous cell carcinoma of oral cavity in males and infiltrating ductal carcinoma of breast in females and in the seventh decade, prostatic adenocarcinoma in males and infiltrating ductal carcinoma of the breast in females. Above age of 70 years, the commonest malignant were again prostatic adenocarcinoma in males and infiltrating ductal carcinoma of breast in females. **Conclusion:** Malignant neoplasms are commonest in the fourth, fifth and sixth decades of life.

Keywords:

INTRODUCTION

The section of Histopathology at the Aga Khan University is the largest center for Histopathology in Pakistan and serves as a referral center for difficult and challenging cases from the entire country. A significant percentages of biopsies reported here are malignant neoplasms. No other center for histopathology in the country diagnoses such a large number of malignant neoplasms. Most modern and state of the art techniques are used to reach a definite diagnosis and to ensure quality reporting which incorporates all information that is relevant to surgeons and oncologists for proper treatment and management of cancer patients.

The aim of the study was to determine in a large series of surgical biopsies, the frequency of various histologic types of primary solid malignant neoplasms in males and females in different age groups. This study therefore will serve as a guide for medical and health professionals regarding age wise distribution of malignant neoplasms in our population in both sexes

MATERIAL AND METHODS

A retrospective study of 20,000 consecutive surgical biopsies reported in the Section of Histopathology, AKU in 2004. Data was obtained by retrieving the filed surgical biopsy reports in the section. All primary malignant neoplasms in this series of 20,000 biopsies were included in the study. Metastatic neoplasms were not included. Borderline neoplasms such as borderline serous and mucinous neoplasms of ovary, giant cell tumor of bone (osteoclastoma), dermatofibrosarcoma

protuberans (DFSP), conventional carcinoid tumors, granulosa cell tumors of ovary etc were not included. Similarly, WHO grade 1 central nervous system neoplasms such as classic meningioma, pilocytic astrocytoma, myxopapillary ependymoma etc were not included. Leukemias were not included, however all non Hodgkin's and Hodgkin's lymphomas were included in the study.

RESULTS

Out of 20,000 biopsies there were 4616 malignant neoplasms (23.08 %). 2393 (51.84 %) of these were in males, while 2223 (48.16%) were in females

The over all percentages of malignant neoplasms in each decade are summarized in table 1, while tables 2 to 9 show the commonest histopathologic types of malignant neoplasms in each decade.

Table 1. Age wise distribution of Malignant Neoplasms in males and females (n = 4616)

| Ages | Total No. of malignant | % | Males | % | Females | % |
|-------|------------------------|-------|-------|-------|---------|-------|
| 0-10 | 196 | 4.24 | 135 | 68.87 | 61 | 31.12 |
| 11-20 | 235 | 5.09 | 135 | 57.44 | 100 | 42.55 |
| 21-30 | 453 | 9.81 | 220 | 48.56 | 233 | 51.43 |
| 31-40 | 789 | 17.09 | 319 | 40.43 | 470 | 59.57 |
| 41-50 | 932 | 20.19 | 399 | 42.81 | 533 | 57.19 |
| 51-60 | 979 | 21.20 | 501 | 51.17 | 478 | 48.82 |
| 61-70 | 716 | 15.51 | 444 | 62.01 | 272 | 37.99 |
| >70 | 316 | 6.84 | 227 | 71.83 | 89 | 28.16 |

Table 2. Commonest Malignant Neoplasms in males and females in ages 0–10 (n = 196)*

| Males (total number = 135)* | | |
|---|------------|----------|
| Histologic type | No. | % |
| Hodgkin's lymphoma | 35 | 25.92 |
| Diffuse large B cell Non Hodgkin's Lymphoma | 15 | 11.11 |
| Wilm's tumor (Nephroblastoma) | 10 | 7.14 |
| Rhabdomyosarcoma | 10 | 7.14 |
| Ewing's Sarcoma / PNET | 9 | 6.67 |
| Neuroblastoma | 7 | 5.18 |
| Burkitt's lymphoma | 7 | 5.18 |
| Retinoblastoma | 6 | 4.44 |
| T-lymphoblastic lymphoma | 5 | 3.70 |
| | ** | |
| Female (Total Number = 61)** | | |
| Wilm's Tumor (Nephroblastoma) | 9 | 14.75 |
| Ewing's Sarcoma / PNET | 8 | 13.11 |
| Hodgkin's Lymphoma | 7 | 11.47 |
| Retinoblastoma | 6 | 9.84 |
| Rhabdomyosarcoma | 5 | 8.20 |
| Burkitt's lymphoma | 4 | 6.55 |
| | *** | |

* Only the commonest entities are listed

** Total number of all malignant neoplasms in males ages 0-10

*** Total number of all malignant neoplasms in females ages 0-10

Table 3. Commonest Malignant Neoplasms in males and females in ages 11 – 20 (n = 235)*

| Males (Total No.= 135)* | | |
|---|------------|----------|
| Histologic type | No. | % |
| Osteosarcoma | 21 | 15.55 |
| Ewing's Sarcoma / PNET | 20 | 14.81 |
| Diffuse large B cell Non Hodgkin's lymphoma | 15 | 11.11 |
| Hodgkin's lymphoma | 13 | 9.63 |
| Germ cell tumor of testis | 13 | 9.63 |
| Colorectal adenocarcinoma | 6 | 4.44 |
| Medulloblastoma | 5 | 3.70 |
| Rhabdomyosarcoma | 5 | 4.44 |
| | ** | |
| Females (Total No. = 100)** | | |
| Ewing's Sarcoma / PNET | 17 | 17.0 |
| Osteosarcoma | 15 | 15.0 |
| Colorectal adenocarcinoma | 9 | 9.0 |
| Diffuse large B cell Non Hodgkin's lymphoma | 8 | 8.0 |
| Hodgkin's lymphoma | 7 | 7.0 |
| Papillary thyroid carcinoma | 6 | 6.0 |
| Rhabdomyosarcoma | 5 | 5.0 |
| | *** | |

* Only the commonest entities are listed

** Total number of all malignant neoplasms in males ages 11-20

*** Total number of all malignant neoplasms in females ages 11 – 20

Table 4. Commonest malignant neoplasms in males and females in ages 21 – 30 (n = 453)*

| Males (Total No. = 220)* | | |
|--|------------|----------|
| Histologic type | No. | % |
| Colorectal adenocarcinoma | 31 | 14.09 |
| Diffuse large B cell Non Hodgkin's lymphoma | 21 | 9.54 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 15 | 6.82 |
| Germ cell tumor of testis | 14 | 6.37 |
| Hodgkin's lymphoma | 13 | 5.91 |
| Squamous cell carcinoma of esophagus | 12 | 5.45 |
| Gastric adenocarcinoma | 9 | 4.10 |
| Osteosarcoma | 8 | 3.64 |
| Squamous cell carcinoma of skin | 7 | 3.18 |
| Papillary urothelial carcinoma of urinary bladder | 7 | 3.18 |
| Ewing's sarcoma / PNET | 7 | |
| Synovial sarcoma | 6 | |
| Others | 70 | 31.8 |
| | ** | |
| Females (Total No. = 233)** | | |
| Infiltrating Ductal Carcinoma of breast | 54 | 23.17 |
| Papillary Thyroid carcinoma | 20 | 8.58 |
| Colorectal adenocarcinoma | 12 | 5.15 |
| Ewing's Sarcoma / PNET | 10 | 4.29 |
| Squamous cell carcinoma of esophagus | 10 | 4.29 |
| Diffuse large B cell Non Hodgkin's lymphoma | 9 | 3.86 |
| Hodgkin's lymphoma | 8 | 3.43 |
| Synovial sarcoma | 6 | 2.57 |
| | *** | |

* Only the commonest entities are listed, **Total number of all malignant neoplasms in males ages 21 – 30, *** Total number of all malignant neoplasms in females ages 21 – 30

Table 5. Commonest Malignant Neoplasms in males and females in ages 31 – 40(n = 789)*

| Males (Total No. = 319)* | | |
|---|------------|----------|
| Histologic type | No. | % |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 48 | 15.05 |
| Diffuse large B cell Non Hodgkin's lymphoma | 40 | 12.23 |
| Colorectal adenocarcinoma | 30 | 9.40 |
| Gastric adenocarcinoma | 17 | 5.33 |
| Papillary urothelial carcinoma of urinary bladder | 15 | 4.70 |
| Squamous cell carcinoma of skin | 14 | 4.39 |
| Squamous cell carcinoma of esophagus | 9 | 2.82 |
| Squamous cell carcinoma of larynx and vocal cord | 9 | 2.82 |
| Leiomyosarcoma | 8 | 2.51 |
| Germ cell tumor of testis | 8 | 2.51 |
| | ** | |
| Female (Total No. = 470)** | | |
| Infiltrating Ductal Carcinoma of breast | 222 | 47.23 |
| Squamous cell carcinoma of esophagus | 34 | 7.23 |
| Colorectal adenocarcinoma | 23 | 4.89 |
| Squamous cell carcinoma of oral cavity (also including tongue, lip, pharynx, gums and palate) | 21 | 4.47 |
| Papillary serous cystadenocarcinoma of ovary | 18 | 3.83 |
| Diffuse large B cell Non Hodgkin's lymphoma | 15 | 3.19 |
| Endometrial adenocarcinoma | 12 | 2.55 |
| Papillary Thyroid carcinoma | 11 | 2.34 |
| Gastric adenocarcinoma | 11 | 2.34 |
| | *** | |

* Only the commonest entities are listed, **Total number of all malignant neoplasms in males ages (31 – 40) ***Total number of all malignant neoplasms in females ages (31 – 40)

Table 6. Commonest Malignant Neoplasms in males and females in ages 41 – 50(n = 932)*

| Males (Total No. = 399)* | | |
|---|------------|----------|
| Histologic type | No. | % |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 50 | 12.53 |
| Diffuse large B cell Non Hodgkin's lymphoma | 40 | 10.02 |
| Colorectal adenocarcinoma | 27 | 6.77 |
| Squamous cell carcinoma of skin | 24 | 6.01 |
| Gastric adenocarcinoma | 23 | 5.76 |
| Squamous cell carcinoma of esophagus | 22 | 5.51 |
| Papillary urothelial carcinoma of urinary bladder | 22 | 5.51 |
| Squamous cell carcinoma of larynx and vocal cord | 17 | 4.26 |
| Non small cell carcinoma of lung | 14 | 3.51 |
| Hepatocellular carcinoma | 13 | 3.26 |
| Renal cell carcinoma | 13 | 3.26 |
| | ** | |
| Females (Total No. = 470)** | | |
| Infiltrating Ductal Carcinoma of breast | 221 | 41.46 |
| Squamous cell carcinoma of uterine cervix | 32 | 6.00 |
| Squamous cell carcinoma of oral cavity (also including tongue, lip, pharynx, gums and palate) | 31 | 5.82 |
| Squamous cell carcinoma of esophagus | 26 | 4.88 |
| Carcinoma of gall bladder | 18 | 3.38 |
| Colorectal adenocarcinoma | 17 | 3.19 |
| Endometrial adenocarcinoma | 17 | 3.19 |
| Diffuse large B cell Non Hodgkin's lymphoma | 15 | 2.81 |
| Gastric adenocarcinoma | 13 | 2.44 |
| Papillary serous cystadenocarcinoma of ovary | 10 | 1.88 |
| | *** | |

* Only the commonest entities are listed, **Total number of all malignant neoplasms in males ages (41 – 50), ***Total number of all malignant neoplasms in females ages (41–50)

Table 7. Commonest Malignant Neoplasms in males and females in ages 51 – 60(n = 979)*

| Males (Total No.= 501)* | | |
|--|------------|----------|
| Histologic type | No. | % |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 60 | 11.98 |
| Diffuse large B cell Non Hodgkin's lymphoma | 43 | 8.58 |
| Papillary urothelial carcinoma of urinary bladder | 35 | 6.99 |
| Squamous cell carcinoma of esophagus | 34 | 6.79 |
| Colorectal adenocarcinoma | 34 | 6.79 |
| Prostatic adenocarcinoma | 33 | 6.59 |
| Squamous cell carcinoma of larynx and vocal cord | 31 | 6.19 |
| Gastric adenocarcinoma | 28 | 5.59 |
| Non small cell carcinoma of lung | 26 | 5.19 |
| Hepatocellular carcinoma | 23 | 4.59 |
| Squamous cell carcinoma of skin | 18 | 3.59 |
| | ** | |
| Females (Total No. = 470) | | |
| Infiltrating Ductal Carcinoma of breast | 147 | 30.75 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 43 | 8.99 |
| Squamous cell carcinoma of esophagus | 31 | 6.48 |
| Endometrial adenocarcinoma | 28 | 5.86 |
| Squamous cell carcinoma of uterine cervix | 28 | 5.86 |
| Gall bladder adenocarcinoma | 20 | 4.18 |
| Colorectal adenocarcinoma | 18 | 3.76 |
| Diffuse large B cell Non Hodgkin's lymphoma | 18 | 3.76 |
| Papillary serous cystadenocarcinoma of ovary | 12 | 2.51 |
| Basal cell carcinoma of skin | 10 | 2.09 |
| | *** | |

* Only the commonest entities are listed

** Total number of all malignant neoplasms in males ages (51 – 60)

*** Total number of all malignant neoplasms in females ages (51 – 60)

Table 7. Commonest Malignant Neoplasms in males and females in ages 51 – 60(n = 979)*

| Males (Total No. = 501)* | | |
|--|------------|----------|
| Histologic type | No. | % |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 60 | 11.98 |
| Diffuse large B cell Non Hodgkin's lymphoma | 43 | 8.58 |
| Papillary urothelial carcinoma of urinary bladder | 35 | 6.99 |
| Squamous cell carcinoma of esophagus | 34 | 6.79 |
| Colorectal adenocarcinoma | 34 | 6.79 |
| Prostatic adenocarcinoma | 33 | 6.59 |
| Squamous cell carcinoma of larynx and vocal cord | 31 | 6.19 |
| Gastric adenocarcinoma | 28 | 5.59 |
| Non small cell carcinoma of lung | 26 | 5.19 |
| Hepatocellular carcinoma | 23 | 4.59 |
| Squamous cell carcinoma of skin | 18 | 3.59 |
| | ** | |
| Females (total numbers = 470)** | | |
| Histologic type | No. | % |
| Infiltrating Ductal Carcinoma of breast | 147 | 30.75 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 43 | 8.99 |
| Squamous cell carcinoma of esophagus | 31 | 6.48 |
| Endometrial adenocarcinoma | 28 | 5.86 |
| Squamous cell carcinoma of uterine cervix | 28 | 5.86 |
| Gall bladder adenocarcinoma | 20 | 4.18 |
| Colorectal adenocarcinoma | 18 | 3.76 |
| Diffuse large B cell Non Hodgkin's lymphoma | 18 | 3.76 |
| Papillary serous cystadenocarcinoma of ovary | 12 | 2.51 |
| Basal cell carcinoma of skin | 10 | 2.09 |
| | *** | |

* Only the commonest entities are listed, **Total number of all malignant neoplasms in males ages (51 – 60)

***Total number of all malignant neoplasms in females ages (51 – 60)

Table 8. Commonest Malignant Neoplasms in males and females in ages 61 – 70(n = 716)*

| Males (total number = 444)* | | |
|---|------------|----------|
| Histologic type | No. | % |
| Prostatic adenocarcinoma | 67 | 15.09 |
| Papillary urothelial carcinoma of urinary bladder | 54 | 12.16 |
| Squamous cell carcinoma of esophagus | 39 | 8.78 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 36 | 8.11 |
| Squamous cell carcinoma of larynx and vocal cord | 33 | 7.93 |
| Gastric adenocarcinoma | 30 | 6.76 |
| Non small cell carcinoma of lung | 28 | 6.31 |
| Diffuse large B cell Non-Hodgkin's lymphoma | 26 | 5.85 |
| Squamous cell carcinoma of skin | 24 | 5.40 |
| Hepatocellular carcinoma | 22 | 4.95 |
| | ** | |
| Females (total numbers = 272)** | | |
| Infiltrating ductal carcinoma of breast | 76 | 27.94 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums, and palate) | 39 | 14.34 |
| Endometrial adenocarcinoma | 25 | 9.19 |
| Squamous cell carcinoma of esophagus | 17 | 6.25 |
| Diffuse large B cell Non Hodgkin's lymphoma | 16 | 5.88 |
| Papillary urothelial carcinoma of urinary bladder | 12 | 4.41 |
| Colorectal adenocarcinoma | 11 | 4.04 |
| Papillary serous cystadenocarcinoma of ovary | 9 | 3.31 |
| | *** | |

* Only the commonest entities are listed,

** Total number of all malignant neoplasms in males ages (61 – 70)

*** Total number of all malignant neoplasms in females ages (61 – 70)

Table 9. Commonest Malignant Neoplasms in males and females in ages > 70(n = 316)*

| Males (Total No. = 227)* | | |
|--|------------|----------|
| Histologic type | No. | % |
| Prostatic adenocarcinoma | 58 | 25.55 |
| Squamous cell carcinoma of larynx and vocal cord | 19 | 8.37 |
| Diffuse large B cell Non Hodgkin's lymphoma | 18 | 7.93 |
| Squamous cell carcinoma of skin | 15 | 6.60 |
| Papillary urothelial carcinoma of urinary bladder | 14 | 6.17 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 13 | 5.73 |
| Colorectal adenocarcinoma | 13 | 5.73 |
| Squamous cell carcinoma of esophagus | 11 | 4.84 |
| Gastric adenocarcinoma | 10 | 4.40 |
| Non small cell carcinoma of lung | 10 | 4.40 |
| Basal cell carcinoma of skin | 9 | 3.96 |
| | ** | |
| Females (Total No. = 470) | | |
| Histologic type | No. | % |
| Infiltrating ductal carcinoma of breast | 22 | 24.7 |
| Squamous cell carcinoma of oral cavity (including tongue, lip, pharynx, gums and palate) | 13 | 14.60 |
| Colorectal adenocarcinoma | 6 | 6.74 |
| Diffuse large B cell Non Hodgkin's lymphoma | 5 | 5.61 |
| | *** | |

* Only the commonest entities are listed, ** Total number of all malignant neoplasms in males ages (> 70)

*** Total number of all malignant neoplasms in females ages (> 70)

DISCUSSION

The section of histopathology, AKU receives biopsy specimens from the whole country and therefore our data, although not an absolute representation, may still be considered a fair indicator of trends in distribution of primary malignant neoplasms in different age groups in our population. This study included 20,000 consecutive biopsy specimens reported by us in 2004. It depicts the frequencies of various malignant neoplasms in males and females in different age group diagnosed at Pakistan's largest center for histopathology. We wish to emphasize the fact that we are reporting the frequency of malignant neoplasms diagnosed by us during our practice and that this data does not represent a cancer registry. Only histopathology specimens were included, while cytology (including fine needle aspiration), bone marrow and bone trephine specimens were excluded from the study.

In our study, malignant neoplasms comprised 23.08% of all biopsies (as shown in the results). Of these, 51.84% were in males and 48.16% were in females. According to tumor registry data of AFIP, Rawalpindi (1992 – 2001) ⁽¹⁾, 59.5% malignant neoplasms were diagnosed in males, while 40.5% were diagnosed in females. According to the annual cancer registry report of SKMCH 2006 ², 47.79%

malignant neoplasms were diagnosed in males and 52.21% in females. According to AFIP data, 4.4% of malignant tumors were diagnosed in the pediatric age group ⁽¹⁾; while according to SKMCH data ², 11% were diagnosed in patients upto 18 years of age. According to our data, as shown in table 1, 4.24% of malignant tumors were diagnosed in the first decade, and another 5.09% in the second decade of life.

As shown in table 1 malignant neoplasms were most commonly diagnosed in the fifth and sixth decades of life, followed by the fourth and seventh decades. Infiltrating ductal carcinoma by its sheer enormity of numbers ensured that the absolute number of malignant neoplasms diagnosed was greater in females compared to males in the fourth & fifth decades and even in the second decade. Males have only a slight edge in overall numbers even in the sixth decade, again courtesy the overwhelming predominance of carcinoma of breast. Only in the first, second and seventh decades and above age 70 were more malignant tumors diagnosed in males.

As shown in table 2, in our study Hodgkin's lymphoma was the clear leader in males in the first decade of life followed by diffuse large B cell Non-Hodgkin's lymphoma. In the western studies, Hodgkin's lymphoma principally occurred in young adults while diffuse large B cell Non Hodgkin's lymphoma comprised only 5 % of non Hodgkin's

lymphomas.³ There were no clear winners in females in our study in the first decade of life.

In the second decade, osteosarcoma and Ewing's sarcoma / PNET led the field in both sexes closely followed by diffuse large B cell Non Hodgkin's lymphoma and Hodgkin's lymphoma. The dominance of osteosarcoma and Ewing's sarcoma / PNET in this age group reflects western data.^{4,5} However, colorectal adenocarcinoma made a strong appearance in both males and especially in females at number three (Table 3). This is due to the fact that in our experience and practice, we have noted that signet ring and mucinous types, which occur in young age group, are common in our population.

According to a study conducted at AFIP⁶, lymphomas and leukemias were the commonest malignant tumors in children (50.4% in males & 37.7% in females). These were followed by tumors of bone (6.3%), CNS (6.3%) and eye (4.84%). A study conducted at AKU on malignant solid tumors in children⁷ showed lymphoma occupying the top position (26.1%) with non hodgkin's and hodgkin's lymphomas comprising 14.6% and 11.5% respectively; followed by CNS tumors (16.6%) and osteosarcoma (7.5%). In the SKMCH cancer registry², hodgkin's and non hodgkin's lymphomas topped among solid tumors with 19.9% and 9.6% respectively followed by gliomas (8.7%) and osteosarcoma (7.3%). According to western data⁸, the commonest solid malignant tumors in children under 10 years of age were neuroblastoma, nephroblastoma, hepatoblastoma, retinoblastoma, rhabdomyosarcoma, teratoma, Ewing's sarcoma and posterior cranial fossa tumors. These reflect the findings in our study (Table 2).

In the third decade (Table 4), sarcomas were relegated to low places, while colorectal adenocarcinoma climbed to the very top in males and maintained its position at number three in females. Diffuse large B cell Non-Hodgkin's lymphoma maintained its high position in males. Infiltrating ductal carcinoma of breast made a triumphant entry at the top in females while papillary thyroid carcinoma also peaked in females at number two. These findings reflect the western data published in various studies⁹⁻¹¹.

In the fourth decade (table 5) squamous cell carcinoma of oral cavity and diffuse large B cell Non Hodgkin's lymphoma occupied the top positions in males, while colorectal adenocarcinoma maintained its high position at number three. In females, no other neoplasms reached close to infiltrating ductal carcinoma of breast; however squamous cell carcinoma of esophagus made a high entry at number two, and colorectal adenocarcinoma maintained its

high position at number three. These figures correspond roughly to international data.^{10,12}

In the fifth decade (Table 6), the sequence of the top three in males remained unchanged from the fourth decade. In females, infiltrating ductal carcinoma of breast remained the runaway winner. Squamous cell carcinoma of cervix entered strongly at number two followed by squamous cell carcinoma of the oral cavity, and the two pushed squamous cell carcinoma of the esophagus to fourth place. The prominent position of squamous cell carcinoma of the cervix in this age group corresponds to western and international figures.¹³

In the sixth decade (Table 7), the top two positions in males remained unchanged, while papillary urothelial carcinoma of urinary bladder climbed to the third place. In females, infiltrating ductal carcinoma of breast remained unchallenged at the top, followed by squamous cell carcinoma of oral cavity and squamous cell carcinoma of esophagus in second and third places. Squamous cell carcinoma of cervix could not maintain its high position of the fifth decade and fell to fourth place which it held jointly with endometrial adenocarcinoma

In the seventh decade (Table 8) prostatic adenocarcinoma climbed spectacularly to the top in males, closely followed by papillary urothelial carcinoma of urinary bladder. Squamous cell carcinoma of esophagus climbed to third place. In females, infiltrating ductal carcinoma of breast retained its top position although its frequency began to fall. Squamous cell carcinoma of oral cavity and endometrial adenocarcinoma occupied the second and third places. The rise of prostatic adenocarcinoma in males and endometrial adenocarcinoma in females was similar to that seen world wide.^{14,15}

Above age 70 the number of reported malignant neoplasms in both sexes showed a decrease probably because of lesser number of people who survive beyond this age. Prostatic adenocarcinoma in males and infiltrating ductal carcinoma of breast in females remained the leaders.

The tumor registry data of AFIP, Rawalpindi (1992 – 2001)¹ listed in adults breast carcinoma on top in females, and prostatic carcinoma on top in males; followed by carcinoma of skin, lymphomas, colorectal and gastric carcinomas, and urinary bladder carcinoma among the commonest malignant neoplasms in both sexes. The SKMCH annual cancer registry report (2006)² listed in adults above 18 years of age, breast cancer on top followed by hepatocellular carcinoma, non hodgkin's lymphoma, cancer of oral cavity and colorectal carcinoma.

Various studies by Bhurgri et al regarding cancer patterns in various cities of Pakistan⁽¹⁶⁻¹⁹⁾ showed cancers of lung, oral cavity, larynx, urinary

bladder, prostate, colorectum, skin and lymphomas as the commonest malignancies in males; and breast, oral cavity, gall bladder, skin, colorectum, esophagus, thyroid and lymphomas etc as the commonest malignancies in females.

According to Cancer Statistics 2003²⁰ the commonest malignant tumors in adult males included carcinomas of lung (14%), colorectum (11%), urinary bladder (6%), and non hodgkin's lymphoma (4%); while in adult females, the commonest malignant tumors included carcinomas of breast (32%), lung (12%), colorectum (11%), uterus (6%), ovary (4%) and non hodgkin's lymphomas (4%).

Cancer Statistics of 2004, 2005 & 2006 consistently show carcinoma of lung, colorectum, and prostate as the three commonest malignant tumors in males; and breast and colorectum as the commonest malignant tumors in females.²¹⁻²³

Progress in reducing the burden of suffering and death from cancer can be accelerated by applying existing cancer control knowledge across all segments of the population.

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