# Pattern of Malignant Tumors Observed in a University Hospital: A Retrospective Analysis

Pages with reference to book, From 120 To 122

Imtiaz A. Malik,Wajahat A. Khan ( Department of Medicine, Aga Khan University Hospital and Department of Oncology, National Cancer Institute, Karachi. )

**Abstract**

A retrospective analysis of all malignant tumors observed in adults over a four-years period is presented. From January 1, 1989 to December 31,1992,2623 patients were coded by the Indexing and Coding Unit of Medical Records, The Aga Khan University Hospital to have cancer. Data presented reflect the relative frequency of different cancers seen at a single institution. Lung cancer was the commonest tumor observed in males, It was closely followed by head and neck cancer and lymphoma. In females, breast was the commonest cancer followed by ovarian and gallbladder. In comparison to the Western figures, an increased frequency of lymphomas and head and neck cancers was observed in males. Prostatic and colorectal cancers were less frequently observed, In females, gallbladder cancer is strikingly more frequent. Cervical cancer was less commonly observed as compared to the other developing countries and uterine cancer was infrequent in comaprison to the Western countries. These data carry important implications for future health planning (JPMA 48:120,1998).

## Introduction

Cancer is a worldwide problem. In 1985, an estimated 7.7 millions people fell victims to this disease. These cases are almost evenly distributed between the developed and the developing countnes[1,2]. There are, however, marked differences in the distribution of different cancers between different regions of the world[2,3]. There are well recognized racial, socio-economic and cultural variations that influence the incidence of different cancers[4,5]. Hence, it is imperative that statistics regarding the relative frequency of different cancers in a region should be available before undertaking proper public health measures. Actual incidence of cancer can only be estimated from population- based tumor registries. In many developing countries, including Pakistan, such data are not available. Instead, relative frequency of different cancers has been reported by some radiotherapy centres in Pakistan[6]. More recently, data based upon analysis of pathologic material has been reported by the Armed Forces Institute of Pathology, Rawalpindi[7]. Referral bias may significantly influence the fmdings reported in these studies. We report the first patient-based single institution study from a university hospital. These findings, alongwith the previous reports, may provide a more balanced estimate of the incidence of different cancers in Pakistan.

## Patients and Methods

The Aga Khan University Hospital is a 417 bedded teaching institution. It provides all major medical and surgical services. Pediatric and gynaecologic services are also well represented. Radiologic services are modern and include the availability of ultrasonography, mammography and CT scanning. Clinical laboratory performs most of the routine and specialized tests. Pathology department is well equipped to perform frozen sections, routine stains as well as more sophisticated immuno-peroxidase studies. Medical and surgical oncology services are available. Radiotherapy and nuclear medicine facilities, however, are not available and patients are referred to the regional centres. This institution

fUnctions as a primary as well as tertiaiy care facility. Most patients visiting the institution belong to either middle or upper socio-eonomic class.
Initial data were obtained from the Medical Record's Indexing and Coding Unit. Tumors were coded according to ICD9 (International Classification of Diseases) coding system. Only hospitalized patients were coded. Patients seen in the out-patients alone who never required hospitalization were not coded and hence are not part of this analysis. Clinical notes were available on all patients. Informationwas collected about age, sex, type of malignancy and histology. Whenever required, pathology slides were reviewed to confirm the diagnosis. Patients included in this analysis were seen over a four-years period from January 1. 1989 to December31, 1992.

**Results**

A total of 2632 adult patients were coded during the four-years period. All patients, 15 years or younger, were excluded fmm the analysis. Mean age of the patients was 49 years (range 15-90 years). Male to female ratio was 1.3:1.

Table I. Relative frequency of different cancers in Pakistani males.

| Types of malignancy | Pakistani males (%) |
|---|---|
| Lung | 15.2 |
| Head and Neck | 10.6 |
| Lymphoma | 10.2 |
| Colon | 7.2 |
| Urinary bladder | 7.1 |
| Leukemia | 6.6 |
| Prostatic | 6.3 |
| Stomach | 5.7 |
| Hepatoma | 5.6 |
| Esophageal | 5.0 |
| Pancreas | 3.2 |
| Others | 17.3 |

Table I indicates twelve common cancers observed in Pakistani men. Lung cancer was the commonest malignancy observed in 15.2% of the cases. It was closely followed by head and neck cancer and lymphoma. Prostatic and colorectal cancers were relatively infrequent.

Table II. Relative frequency of different cancers in Pakistani females.

| Type of malignancy | Pakistani females (%) |
|---|---|
| Breast | 32.5 |
| Ovary | 7.9 |
| Gallbladder | 7.7 |
| Lukemia | 7.1 |
| Head and Neck | 6.9 |
| Esophagus | 4.5 |
| Colon | 4.2 |
| Brain | 3.2 |
| Cervix | 2.9 |
| Lung | 2.5 |
| Stomach | 2.5 |
| Others | 15.9 |

Table II indicates 12 common cancers that were observed in Pakistani females. Breast cancer was the commonest tumor observed in women. It was followed by ovarian and gallbladder cancers. Uterine and cervical cancers were both relatively uncommon.

**Discussion**

This study, as well as the other studies from Pakistan, report the relative frequency of different cancers. Population-based incidence or mortality figures are not available. Such institution-based studies are subject to several areas of bias. Referral bias may reflect the availability of certain services at a particular Anstitution. It is likely that pattern of malignancies seen at the radiotherapy centres may reflect more frequent referral of tumors where radiation plays an important therapeutic role such as head and neck and cervical cancers. For similar reasons, hematologic malignancies or cancers predominantly treated by surgery such as gallbladder or colonic cancers may be under-represented at the radiotherapy facilities.

Similar bias may exist in figures reported from our institution. Lack of radiaiion facilities may have altered the referral pattern. Restricting the analysis to cancerpatients who were diagnosed at our institution may have helped to diminish this referral bias.

Another bias in our figures may be created by under representation of patients belonging to Iow-socio-economic status. This may result in an excess of cancers that are more prevalent in middle to higher socio-economic class. Additionally, Uthan-rural variation in the incidence of cancer has been previously documented. Such differences have been observed in even small relatively homogenous countries[8]. Another important factor is the availability of diagnostic services as reflectedby the changing incidence ofoesophageal cancer in Lesotho[9]. Additionally, retrospective nature of our study has certain limitations that are inherent in such studies. These reasons may explain some of the differences observed between our findings and others.

Our results differ from other studies fmm Pakistan as well as the Western countries. In males, the commonest cancer observed was lung. It is also the commonest cancer worldwide. Lower frequency reported by the Armed Forces Institute of Pathology and the radiotherapy centres in Pakistan may be related to several factors[6,7]. These two studies, were based on data collected several years ago. It is well recognized that incidence of lung cancer parallels the incidence of smoking, albeit with a lag period of several years. Tobacco consumption has increased at a yearly rate of 2.1% in the third world countries[10]. Lower figures for lung cancer in the previous two studies may reflect the hiatus between initiation of smoking and the development of cancer. Smoking and resultant lung cancer in the developing countries appears to be achieving the same epidemic proportions as are evident in the developed world. Our study suggests that this may already have happened in Pakistan.

Two other cancers in men are relatively more frequent in our patients as compared to the Western countries. Head and neck cancer has been reported as the commonest cancer in Southern Pakistan[6]. This is consistent with other reports from South Asia[3]. Head and Neck cancer has been associated with smoking as well as use of alcohol. It is also associated with a very prevalent habit in Pakistani men of chewing pan; a quid Of betel leaves, nuts, tobacco and lime.

High incidence may also be related to less frequent use of vegetables and fruits in Pakistan. Public education as well as measures to detect these tumors early may assist in decreasing the incidence as well as mortality from head and neck cancer. Relatively more frequent observation of non-Hodgkin's lymphoma is an unusual feature observed in our study. Anned Forees Institute of Pathology, Pakistan reported lymphoma as the commonest malignancy in males. Similar figures are reported from certain parts of Africa[3]. This is in marked contrast to the Western countries. Although exact reason for this high frequency of lymphoma remains
unknown, higher incidence of infections and malnutrition in the developing countries is likely to play an etiologic role.

Another interesting feature of our study is the lower frequency ofpmstatic and colorectal cancers in men. Prostatic cancer is the commonest cancer in men in the United States[11]. There are racial differences observed in it's incidence with highest figures reported for AmericanBlacks[4]. Low incidence observed in our study may be related to the racial differences or decreased life expectancy as compared to the American males. Colorectalcanceris a common malignancy observed in American men[11]. It's incidence is related to economic development and industrialization, Dietary factors also influence the incidence of this cancer; Colorectal cancer has been infrequently reported from several developing countries[3]. A previous study suggested thatPakistan may have lower incidence of gastric and colorectal cancers as compared to other countries in the Indian subcontinent[12]. Most likely reason is related to the dietary habits, however, influence of other factors cannot be excluded.

In females, as reported by others, breast cancer is the commonest malignancy observed in our patients. However, several other differences were observed. Gallbladder and ovarian cancers wre more frequently observed in our patients. Gallbladder cancer has also been reported by the Anned Forces Institute of Pathology, Pakistan as one of the commonest malignancies of gastrointestinal tract origin[7]. This is consistent with our data. High incidence of gallbladder cancer in females of Asian origin was also observed in a study from the United Kingdom[13]. Interestingly, this cancer is infrequently reported from other neighboring countries including India and Iran[3]. It is also a rare tumor in the United States". However, Native Indian females in the United States have one of the highest incidence rates for this cancer[14]. It is also more frequently observed in Hispanics[15]. Epidemiology of gallbladder cancer parallels that of gallstones. It is also likely that dietary and hormonal factors play important etiologic roles. Further studies in Pakistan are necessary to explore these associations. Similarly, ovarian cancer is observed more frequently in our patients than elsewhere. This is consistent with data from Armed

Forces Institute of Pathology, Pakislan.In contrast, studies from the radiotherapy centres in Pakistan as well as data reported from India suggest cervical cancer to be the commonest tumor of gynaecologic origin[3]. However, cervical cancer to be the commonest tumor of gynaecologic origin[3]. However, cervical cancer was less frequently observed in Muslim than non-Muslim women of Bombay[16]. It is also likely that cervical cancer may be under-represented in our study due to lack of radiotherapy facilities at our institution. Endometrial cancer was infrequently observed in our patients. Other studies from Pakistan have also observed fewercases ofendometrial cancer as compared to other gynaecologic cancers. This is in marked contrast to the United states where endometnal cancer is the commonest cancer of gynaecologic origin[11]. Our data, however, are not entirely inconsistent with reports from other developing countries[3]. Differences in frequency of hormonal replacement therapy may be partly responsible for this variation. Lower life expectancy in the developing countries as well as differences in dietaryr habits may also be playing an important etiologic role.

In conclusion, retrospective analysis of malignant tumors observed at our institution suggest a pattern that is different from the neighboring countries as well as the developed world. In countries like Pakistan, statistics on cancer incidence are unavailable and estimates have to rely upon cancer frequency data. Such estimates are of limited validity and may relate to localized and possibly unrepresentative regions within a large country. Nevertheless, until population-based incidence and mortality figures are available, studies like ours may provide useful information that can be utilized for health planning and future research.

**Acknowledgements**

Authors thank housestaff, Department of Medicine and staff of Medical Records, Aga Khan University Hospital for assistance in collection and publication of data.

**References**

1. Parkin. D.M., Muir, CS., Whelan, S.L. et at. eds. Cancer incidence in five continents, Volume VI, Lyon, (~ARC Scientific Publication No. 128) IARC, 1992.
2. Pisani, P. Burden of cancer in developing countries. In: Pearce, N. Matos, E., Vainio, H. et al.(eds). Occupational cancer in developing countries (IARC Scientific Publications No. 129), Lyon, IARC, 1994, pp. 31.39.
3. Parkin, D.M., Pisarn. P. and Ferlay,J. Estimates of the worldwide incidence of 18 major cancers in 1985, Int. J. Cancer, 1993;54:594-606.
4. Page, H,S. and Asire, A.J. (eds). Cancer rates and risks. 3rd edition; U.S. Department of Health and Human Services. Washington, D.C. NIH Publication, 1985,pp. 85-691.
5. 2 Satariano, W.A and Swanson, G.M. Recial differences in cancer incidence: The significance of age-specific patterns. Cancer, 1 988;62:2640.2653.
6. Jafarey, NA., and Zaidi S.H.M. Cancer in Pakistan. J. Pak. Med. Assoc., l987;37: 178.1 83.
7. Ahmad, M., Khan, A.H. and Mansoor, A. The pattern of malignant tumors in Northern Pakistan. J. Pak. Med. Assoc., 1991 :41:270-273.
8. Friis. S. and Storm. H.H. Urban-rural variation in Cancer incidence in Denmark 1943-1987. Eur. J. Cancer, 1993 ;29A: 538-544.
9. MacCormick, RE. The changing incidence of cancer of the esophagus in Lesotho: Real or improved diagnostic ability. E. Afr. Med. J., 1989;66:27-30.
10. Stanley, K. and Stjernsward, J. Lung cancer in developed and developing countries. Cancer Treat. Res., 1 989;45: 1-14.

11. Boring, CC., Squire, T.S., and Tong, 1. Cancer statistics. CA. Can. J., 1992;42: 19-27.
12. Hart, A.R., Mann, R. and Mayberry, JR Gastric and colorectal cancerin the rural Indian subcontinent: A survey of patients attending Mission hospitals. Digestion, l992;5l :110-114.
13. Barker, R.M. and Baker, M.R. Incidence of cancer in Bradford Asians. J. Epidemiol. Comm. Health, (London) 1 990;44: 125-129.
14. Bleed, D.M, Risser. DR.. Sperry, S. et at. Cancer incidence and survival among American Indians registered for Indian Health Services care in Montana, 1982-1987. J. NatI. Cancer Inst., 1 992;84: 1500-1505.
15. Albores-Saavedra, J., Alcantra-Vazquez. A., Cruz-Ortiz, H. et al. The precursor lesions of invasive gall bladder carcinoma. Hyperplasia, atypical hyperplasia and carcinoma in situ. Cancer, 1980;45 :919-927.
16. Jussawala, D.J., Yeole, B.B. and Natehar, M.V. Cancer in Indian Muslims. Cancer, 1985;55:1149.1158.