Cancer Incidence in the Districts of Dir (North West Frontier Province), Pakistan: A Preliminary Study

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Background: Pakistan has a high incidence of cancer. The most severely affected province is the North West Frontier Province, which has districts of low socioeconomic status such as those in Dir. The purpose of this study was to analyze the cancer registry record of patients from the districts in Dir in order to obtain a net cancer incidence for use in proposing future health plans.

Methods: The medical records of 1,105 patients registered at the Institute of Radiotherapy and Nuclear Medicine in Peshawar were traced. Information regarding age, gender and affected sites were obtained.

Results: The incidence of cancer increased, with a mean incidence of 15.04 per 100,000 in 2000–2004. Of the 1,105 patients, 62% were male and 38% were female. The most affected female age groups were 41–50 and 51–60; while males in the age groups of 51–60 and 61–70 had the highest risk. The leading cancers were lymph/blood, and cancers of the digestive system, skin and breast.

Conclusion: The increasing trend of cancer in Dir is alarming. Since this study was a preliminary investigation, it could provide a leading role in prevention, treatment and future planning regarding cancer in Pakistan. [*J Chin Med Assoc* 2008;71(2):62–65]

Key Words: cancer in Pakistan, incidence rate, site wise cancer registry

Introduction

Pakistan has a high incidence of cancer, from its independence in 1947 to the present.[1] The escalating burden of non-communicable diseases worldwide warrants an urgent public health response, especially for Pakistan.[2] Different cancer registries are working in the country to diagnose and provide possible treatment. The data are compared to obtain a net national cancer registration; for example, the differences in the incidence of cancer in Karachi and Quetta have been studied. The incidence of cancer in Quetta is comparable to that in high-incidence regions in other parts of the world, whereas the incidence in Karachi is similar to that in moderate-incidence zones.[3] The most severely affected province of Pakistan is the North West Frontier Province (NWFP), where only 1 cancer registry is functioning—that of the Institute of Radiotherapy and Nuclear Medicine (IRNUM), Peshawar.[4]

Some studies here show the analysis of frequency of most common cancers. The medical records of all patients attending IRNUM during 1990 to 1994 have been studied. There were 13,359 adults with biopsy-proven cancers; of these, 10,371 were from the NWFP and the remaining 2,988 were Afghan refugees. Of the NWFP group, there were 55% males and 45% females, while among the Afghan refugees, there were 59% males and 41% females. The most common male tumors were skin, lymphoma, oral cancer, urinary bladder, lung, esophagus, soft tissue, prostate, brain and myeloid leukemia.[5] Another retrospective study of 14,018 malignant tumors from northern Pakistan found that among males, the most common sites were lymph node, leukemia, skin, prostate, colorectal, bone and

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stomach, and among females were breast, skin, ovary, leukemia, gallbladder, thyroid and bone.[6]

The distributions of malignant tumors in various districts of northern Pakistan and among different ethnic groups such as the Pathans, Punjabis and Urdu-speaking peoples have also been outlined. Age-standardized cancer ratio was calculated to compare data from neighboring countries in the region. Prostate cancer in males and gallbladder carcinoma in females were more frequent according to our data compared to other countries in the region. Comparison of the pattern of malignant tumors in the North and South has also been highlighted.

Dir, a former state of Nawab, is situated in the northwest of NWFP. Touching and bounded by the long chain of Kohi Hinducash, Dir was divided into 2 district administrations in 1996: Upper Dir and Lower Dir. However, as there are no reports in the literature on the incidence of cancer in these 2 districts, this study aimed to analyze the cancer incidence in the districts of Dir.

Methods

The area for this study was chosen from districts of lower socioeconomic status in the Malakand Division. They are situated in the northwest of Pakistan and are part of the NWFP. The total population of Dir was 1,375,657 in 2000, with annual growth rates of 2.76% for Upper Dir and 3.42% for Lower Dir.[7] Data were collected from the cancer registry of IRNUM during the months of November and December 2005. Data for 5 years, from January 2000 to December 2004, were collected. The medical records of 1,105 patients were traced, and information on laterality of tumor, spread of tumor, and site were obtained. The residence status of cases was ascertained and rechecked. The variables recorded were: hospital patient number, date of incidence, site, age, sex, and address.

Results

The annual incidence rates from 2000 to 2004 are presented in Table 1. Of the 1,105 cancer patients included for analysis, 681 (62%) were male and 424 (38%) were females. The rate of cancer was higher in males than in females for all ages (Figure 1).

Table 1. Cancer incidence for 2000 to 2004

Year	Patients (*n*)	Population (*n*)	Incidence*
2000	186	1,375,657	13.52
2001	220	1,418,691	15.50
2002	202	1,463,085	13.80
2003	228	1,508,884	15.11
2004	269	1,556,132	17.28
	1,105†		15.04‡

**Incidence is per 100,000 population; †total number of patients registered in IRNUM from 2000 to 2004; ‡mean incidence/year.*

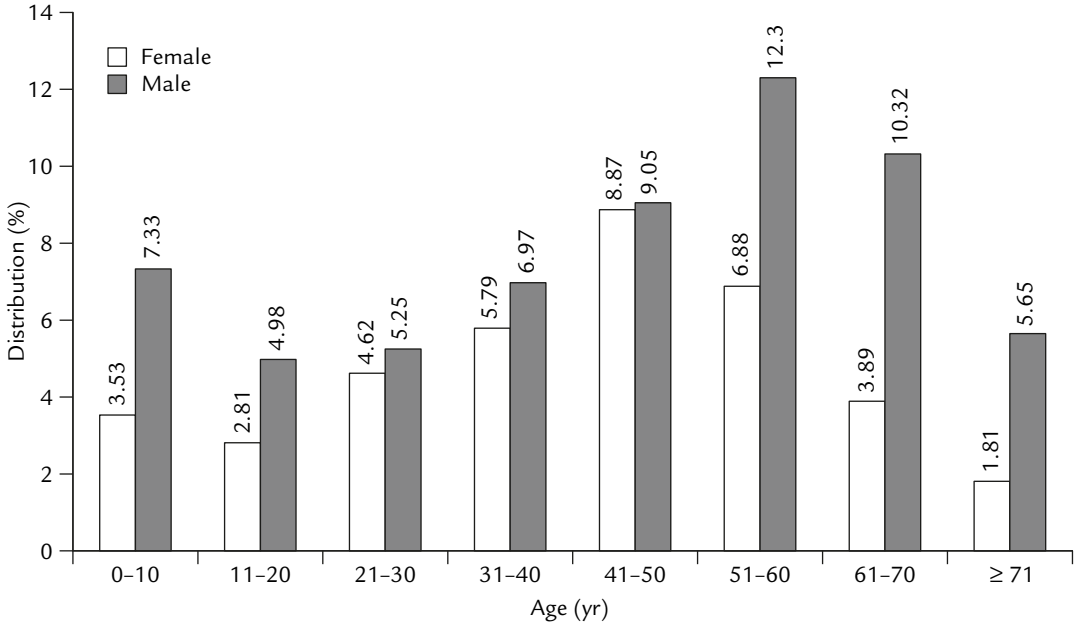

Figure 1. Age-wise distribution of cancer patients in Dir.

Table 2. Site-wise cancer incidence in Dir from 2000 to 2004

	Patients (*n*)						
	2000	2001	2002	2003	2004	Mean	%
Lymph/blood	45	47	51	47	68	51.6	23.22
Digestive system	25	25	20	26	29	25.0	11.25
No record	12	26	14	21	21	18.8	8.46
Skin	12	17	17	20	14	16.0	7.20
Other	6	12	12	20	22	14.4	6.48
Male genital organs	15	14	8	14	17	13.6	6.12
Brain/central nervous system	8	11	11	10	18	11.6	5.22
Female genital organs	13	12	11	7	12	11.0	4.95
Oral cavity	9	11	9	8	17	10.8	4.86
Breast	8	9	12	13	8	10.0	4.50
Urinary system	11	5	8	8	13	9.0	4.05
Respiratory system	5	8	11	14	6	8.8	3.96
Bone	9	9	8	6	11	8.6	3.87
Soft tissue	2	7	8	6	12	7.0	3.15
Endocrine/exocrine glands	6	9	3	9	3	6.0	2.70

Collected data were arranged according to primary site of cancer. The most common types of cancer were those of the lymphatic and hematopoietic systems, with a mean of 51.6 patients per 100,000 population a year (Table 2). The second most common type was cancer of the digestive system, with a mean of 25 patients per 100,000 population a year. Skin cancer was in third position with a mean of 16 patients per 100,000 population a year. Soft tissue and endocrine/exocrine gland cancers were the least common, with 7 and 6 patients per 100,000 population a year, respectively.

Discussion

The present study was a preliminary investigation in the NWFP of Pakistan. The data show information regarding the most affected persons, especially age-wise, gender-wise and site-wise, and also the annual increase in cancer incidence. There was an overall increasing trend in cancer incidence during 2000 to 2004. The highest incidence of 17.3 per 100,000 population was found in 2004. Over the 5 years, the mean incidence was 15.0 per 100,000. The most important and probable reasons for this high rate are illiteracy, use of pesticides,[8] low intake of antioxidants, high burden of work and little rest.[9]

Gender distribution revealed that men were more affected than women: 681 (62%) of the patients were male and 424 (38%) were female. This high rate of cancer in males as compared to females is similar with a study from Karachi, which reported 54% of males and 46% of females.[10] For females, the most affected age group was 41–50, with 8.87% occurrence, and the second most affected age group was 51–60, with 6.88% (Figure 1). The least affected female age group was the ≥71 group, with 1.81%. For males, the most affected age group was 51–60 (12.3% occurrence), followed by 61–70 (10.32% occurrence). The least affected male age group was the 11–20 group (4.98% occurrence). This distribution was mainly dependent on the sites affected.

The collected data arranged on the basis of primary site affected by cancer show that cancer of lymphatic and hematopoietic sites was the most common and increased with time, with a mean value of 51.6 per 100,000 (23.2%). Such cancers included Hodgkin's lymphoma, non-Hodgkin's lymphoma, myeloid leukemia and multiple myeloma. This study supports a report of the International Network of Cancer Treatment and Research[11] regarding the high incidence of lymphoma. The second leading cancer in our study was that of the digestive system (esophagus, stomach, gallbladder, liver, intestine, etc.) with a mean value of 25 per 100,000 (11.3%). The esophageal cancer rate was, however, higher in the NWFP than in Punjab province,[12] while it was equally common in males and females in Pakistan.[3,13] In this study, we found that there was no record of some patients, who had neither been subjected to treatment nor categorized under a particular type of cancer; however, their registry data were included. The possibility of referral to other cancer hospitals does exist. Breast cancer in women was ranked 10th, with increasing trend in

each year and a mean value of 10 per 100,000 (4.5%). Women of low socioeconomic status often have advanced breast cancer and delayed diagnosis,[14] which could explain our findings. Cancer of soft tissue and endocrine/exocrine glands were ranked last with a mean of 7 (3.2%) and 6 (2.7%) patients per 100,000.

The precise incidences, mortality rates, number of new cancer cases and number of deaths annually for the whole of Pakistan[14] and in the districts of Dir are unknown. However, this study was a preliminary investigation and represents an addition to the data on incidence and associated risk factors in Pakistan. Socioeconomic background is important in determining risk, and greater emphasis on education is necessary.[15] The selected region in this study is of very low socioeconomic status and the results showed an increasing rate of cancer. Increased awareness by education is very important and may play a preventive role.

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