

Cancer Patterns in Karachi Division (1998-1999)

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Abstract

Objective: A minimal cancer incidence data for Karachi, the largest city of Pakistan, is being presented here, for the years 1998-1999. The city has a population of 9,802,134; males 5,261,712 (52.6%) and females 4,540,422 (47.4%); census 1998.

Methodology: A predominantly mixed (passive and active) registration system has evolved in Karachi, the data sources being the hospitals within the Karachi Division. The reported/retrieved cancer data sets at the Karachi Cancer Registry are checked, coded, computerised in an analytical format and analysed.

Results: The incident cancer cases registered in Karachi, during the 2-year period, 1st January 1998 to 31st December 1999 were analysed. The age-standardised incidence rate (ASR) of cancer, all sites was 132.4/100,000 for the males. Cancer of the lung 10.8%; ASR 17.3 was the most frequently recorded malignancy, followed by oral cavity 10.5%; ASR 13.2 and larynx 5.0%; ASR 7.4. The age-standardised incidence rate (ASR) of cancer, all sites was 133.0/100,000 in the females. Cancer of the breast, 32.0%; ASR 40.7 was the most frequently recorded malignancy, followed by oral cavity 8.1%; ASR 11.7 and gall bladder 3.6%; ASR 5.5.

Conclusion: The present data has been calculated with an estimated 15-20% probable under ascertainment. Tobacco-associated cancers in Karachi were responsible for 38.3% of the tumours diagnosed amongst the males. Two principal cancers, breast and oral cavity were responsible for 40.1% of the cancers in females. A rare finding was the high incidence of gall bladder cancer in the females. At present it is difficult to determine whether this indicates a genuine high risk or a selection bias. A continuous process of cancer registration to study the trends in the incidence and an adequate cancer control program are possible and essential for Pakistan and can be based on the pattern being practiced in Karachi (JPMA 52:244; 2002).

Introduction

Karachi, the largest city of Pakistan is divided into 5 districts, South, Central, West, East and Malir. The city has a population of 9,802,134; 5,261,712 males and 4,540,422 females (census 1998)¹. The incidence rates for the entire city of Karachi (also called Karachi Division), have never been calculated, though the relative frequency data have been published for the years 1979-1983², followed by a gap of 15 years. During this period the incidence data for Karachi South, a district of Karachi, have been published for the years 1995-1999^{3,4}. In the present publication we have tried to calculate the minimal incidence rates for 2 years; 1998-1999.

Methodology

A predominantly mixed (passive and active) registration system has evolved in Karachi, the data sources being the hospitals within the Karachi Division. The demographic, clinical and diagnostic information, provided by the hospitals is checked, coded (ICD-O2)⁵ and computerised. All cancer cases are included, clinically diagnosed as well as the microscopically verified ones. The cases registered included both invasive cancers and in-situ lesions in all anatomical sites, including non-melanoma skin cancer. The death registration system is computerised in a few districts but the data has limited application, as registration of deaths seems to be both incomplete and inadequate. The methodologies implemented for evaluating completeness and the criteria used to assess validity are as recommended by the International Agency for Research on Cancer (IARC) and the International Association of Cancer Registries (IACR)^{6,7}. A customised version of Canreg-3 software was used to computerise the data and cases were confirmed after validity checks. Other computer softwares viz. SSPS, Epi-2000 and SAS supplemented the analyses.

Results

A total of 7396 new cancer cases were registered in the males in Karachi Division, during the 2-year period, 1st January 1998 to 31st December 1999. The age-standardised incidence rate (ASR) of cancer, all sites (1998-99) was 132.4/100,000. The five most common cancers in the males were cancer of the lung (ICD-10 C33-C34)⁸ (10.6%; ASR 17.0), the most frequently recorded malignancy, followed by oral cavity (ICD-10 C00-C06) (9.4%; ASR 12.0), larynx (ICD-10 C32) (5.0%; ASR 7.4), prostate (ICD-10 C61) (4.0%; ASR 7.3) and urinary bladder (ICD-10 C67) (4.5%; ASR 7.3). The tobacco-associated cancers were responsible for 33.9% of the tumours diagnosed.

Table'. Relative frequency and incidence rates of cancers in Karachi Division (1998-1999).

	Male			Female			ICD (10th)
	Rel.* Freq. %	Crude Rate	ASR World	Rel.* Freq. %	Crude Rate	ASR World	
Oral Cavity	10.5	7.4	13.2	8.1	6.1	11.7	C00-08
Pharynx	3.9	2.8	5.7	1.6	1.1	2.1	C09-14
Oesophagus	3.6	2.6	5.0	3.1	2.4	4.9	C15
Stomach	2.8	2.0	3.9	1.2	0.9	1.6	C16
S. Intestine	0.3	0.2	0.4	0.3	0.2	0.4	C17
Colo-rectum	4.5	3.2	5.3	3.0	2.2	3.8	C18-21
Liver	2.6	1.8	3.9	1.5	1.2	2.4	C22
Gall bladder	1.0	0.7	1.4	3.6	2.7	5.5	C23-24
Pancreas	0.5	0.3	0.6	0.5	0.3	0.7	C25
Nose, sinuses etc.	0.4	0.3	0.5	0.3	0.2	0.4	C30-31
Larynx	5.0	3.5	7.4	0.8	0.6	1.3	C32
Bronchus, lung	10.8	7.6	17.3	1.4	1.1	2.2	C33-38
Bone	1.6	1.1	1.1	1.2	0.9	0.9	C40-41
Connective tissue	1.9	1.3	2.0	1.3	1.0	1.3	C47;49
Mesothelioma	0.1	0.0	0.1	0.0	0.0	0.0	C45
Melanoma of skin	0.3	0.2	0.4	0.1	0.1	0.1	C43
Other Skin	3.4	2.4	4.7	2.4	1.8	3.4	C44
Breast	0.7	0.5	0.9	32.0	24.1	40.7	C50
Uterus	-	-	-	2.3	1.7	3.5	C54-55
Cervix	-	-	-	3.7	2.8	5.2	C53
Placenta	-	-	-	0.3	0.2	0.2	C58
Ovary	-	-	-	3.8	2.9	4.9	C56
Oth. female genital	-	-	-	0.4	0.3	0.6	C51-52;57
Prostate	4.0	2.8	7.3	-	-	-	C61
Testis	1.1	0.8	0.8	-	-	-	C62
Penis	0.1	0.0	0.1	-	-	-	C60
Other male genital	0.0	0.0	0.1	-	-	-	C63
Bladder	4.5	3.2	7.3	1.1	0.8	1.8	C67
Kidney	1.4	1.0	2.1	0.8	0.6	1.1	C64-66;68
Eye	0.4	0.3	0.4	0.3	0.2	0.3	C69
Brain, N. system	3.3	2.3	3.0	1.8	1.4	1.6	C70-72
Thyroid	0.7	0.5	0.7	2.1	1.6	2.4	C73
Other endocrine	0.1	0.1	0.1	0.1	0.1	0.1	C74-75
Hodgkin's disease	1.9	1.3	1.4	0.7	0.5	0.7	C81
NHL	5.6	3.9	5.8	3.1	2.3	4.0	C82-85;96
Multiple myeloma	0.8	0.5	1.1	0.4	0.3	0.6	C88;90
Leukemia	4.5	3.2	3.7	2.9	2.4	3.2	C91-95
Unspecified	17.5	12.3	24.5	13.9	10.5	19.6	
All sites	100	70.2	132.4	100	75.3	133.0	

*Rel. Freq. - relative frequency

A total of 6847 new cancer cases were registered in the females during the 2-year period between 1st January 1998 to 31st December 1999. The age-standardised incidence rate (ASR) of cancer, all sites (1998-99) was 133.0/100,000. The five most common cancers in the females were cancer of the breast (ICD-10 C50) (32.0%; ASR 40.7) followed by oral cavity (ICD-10 C00-C06) (7.5%; ASR 11.0), gall bladder (ICD-10 C23-C24) (3.6%; ASR 5.5), cervix (ICD-10 C53) (3.7%; ASR 5.2) and ovary (ICD-10 C56) (3.8%; ASR 4.9). Two principal cancers -breast and oral cavity were responsible for 40.1% of the cancers in females. Altogether breast, oral cavity, ovary and cervix were responsible for 47.6% of the cancers in females.

Discussion

Comparison of the data of Karachi Division (KD) with contemporary data of Karachi South (KS), shows a similarity of incidence patterns with a few exceptions (KS)^{3,4}. The overall incidence rates are lower, this is an indication of under-coverage. Males and females have an equal risk. The incidence rate amongst females is considerably reduced due to a lower incidence of breast cancer. The stage at diagnosis for all cancers remains very advanced.

Lung and breast cancers remained the leading malignancies amongst the males and females. Oral cancer was the second most common cancer, with similar rates in both sexes. The epithelial changes associated with the practice of tobacco chewing potentiated⁸⁻¹³ by areca nut chewing, under nourishment and poor oral hygiene have manifested in the causation of squamous cell carcinomas in children as young as 10-14 year. The third most common cancer amongst the males was Larynx cancer predominantly a squamous cell carcinoma, with tobacco chewing and under nourishment as the most likely carcinogens. Gall bladder was the third most common cancer site in the females though ninth in KS. A high prevalence of gallstones is the probable etiological determinant associated with dietic and hormonal factors. The possibility of a genetic basis independently or in association with environmental pathogens cannot however be overlooked. At this stage one cannot determine whether this indicates a genuine higher risk or a selection bias.

It is very difficult to study the trends in the cancer patterns in Karachi, because such a comparison would require an observation of incidence rates over the past fifty years, which are not available. The relative frequency data of PMRC/JPMC (1979-1983) for Karachi, when compared with the relative frequency data of KS and KD showed a very high tongue, pharynx, esophagus, lung and bone cancer amongst the males. Similarly in the females tongue, mouth, pharynx, esophagus, larynx, lung, cervix were over-represented. Cancer sites, not amenable to radiotherapy, were under-represented in the data i.e. stomach, colon, rectum and prostate in men and cancers of the stomach, colon, rectum, breast, ovary and brain in the females. These are patterns of a referral radiotherapy unit and do not indicate a falling incidence of tobacco-related cancers in the present times. The under-representation may also be an indicator of lack of endoscopic biopsies, biochemical and radiological non-invasive diagnostic techniques viz. magnetic resonance imaging (MRI) and computerised tomography (CT) scan in the 1979-1983 era, which produced a deficit of cases of inaccessible tumors sites (e.g., of the lung and

pancreas). Some care is needed in the interpretation of data, when making comparisons between different series or over time². The undeniable fact however remains that there is an accentuated role of tobacco-related cancers in all data series in Karachi, both in the males and females.

Conclusion

The overall incidence rate in Karachi Division (KD) is lower than in Karachi South (KS); this could be an indication of under-coverage. Males and females have an equal risk. The incidence rate amongst females is considerably reduced due to a lower incidence of breast cancer in comparison to KS. The first ten cancers in KD and KS remain the same, except for the difference in rating. The rating of gallbladder cancer at number 3 in the females of KD is unexpected and may represent a selection bias. Amongst the males, contribution of tobacco-related cancers remain significant in all data series and there is a desperate need for tobacco control measures to be implemented.

References

1. Census Bulletin-I, Population and Housing Census of Pakistan 1998, (1 999), Population Census Organisation Statistics division, Federal Bureau of Statistics, Government of Pakistan, July 1998.
2. Parkin DM, Cancer Occurrence in Developing Countries. IARC Technical Report No. 75. International Agency for Research on Cancer, Lyon. 1986.
3. Bhurgri Y., Bhurgri A., Hassan S.H, et al Cancer Incidence in Karachi, Pakistan: First Results from Karachi Cancer Registry. *Int. J. Cancer*, 2000 85; 325-329.
4. Bhurgri Y, Cancer Registration in Pakistan. *Asia Pacific J. Cancer Prey*, 2 IARC Supplement, 2001; 51-54.
5. WHO. International Classification of Diseases for Oncology, Ed. 2, Geneva, World Health Organisation, 1990.
6. Jensen O.M., Parkin D.M., MacLennan R., Muir C.S. & Skeet R.G., Eds. *Cancer Registration: Principles and Methods*; IARC Scientific Publications No, 95 Lyon IARC. 1991,
7. Parkin D.M., Chen V.W., Ferley J., Galceran J., Storm H.H. & Whelan S.L. Eds. *Comparability and Quality Control in Cancer Registration*, IARC Technical Report No.19, Lyon IARC, 1994.
8. Jafarey NA, Mahmood Z, Zaidi SHM. Habits and dietary patterns of cases of carcinoma of the oral cavity and oropharynx. *J. Pak. Med. Assoc.*, 1977; 27; 340-43.
9. Jafarey NA. Betel quid, betel nuts and other chewing habits. *Postgraduate Doctor Africa*. 1994; 15, 42-44.
10. Alam, SE., Prevalence and pattern of smoking in Pakistan. *J. Pak. Med. Assoc.*, 1998; 48: 64-66.
11. Merchant, AT., Luby, S.P and Perveen, G., Smoking in Pakistan: more than cancer and heart disease. *J. Pak. Med. Assoc.*, 1998; 43; 77-79.
12. Sankaranarayanan R, Duffy SW, Padmakumari G, et al. Tobacco chewing. alcohol and nasal snuff in cancer of the gingiva in Kerala, India. *Brit. J. Cancer*, 1989; 60; 638-43.

13.Sankaranarayanan R, Duffy SW, Padmakumari G, et al. Risk factors for cancer of the buccal and labial mucosa in Kerala, India J.Epidemiol Comm. Health, 1990; 44: 286-92.