

RESEARCH COMMUNICATION

Cancer Pattern in Western Nepal: A Hospital Based Retrospective Study

VS Binu^{1*}, TS Chandrashekhar¹, SH Subba¹, Samuel Jacob², Anjali Kakria³, P Gangadharan⁴, Ritesh G Menezes⁵

Abstract

Information on cancer patterns is an important basis for determining the priorities for cancer control in different countries worldwide. There is no reliable information about the incidence or pattern of cancer in Nepal and hence an attempt was made to assess the situation based on hospital data which is the only source in the western region of Nepal. Cancer cases diagnosed by all methods or treated in Manipal Teaching Hospital, affiliated to Manipal College of Medical Sciences, Pokhara, during 1st January 2003 to 30th May 2005 were used for the present study. A total of 957 cancer cases were identified with a male to female ratio of 1.1:1. The median age of male and female patients was 63 and 60 years, respectively. The proportion of microscopically confirmed cases, both from primary and metastatic sites was 87.5% and tobacco-related cancers constituted 48% of all cancers among males and 28% among females. For males the leading cancer sites were lung (22.2%), larynx (9.8%) and stomach (9%) and that for females was lung (20%), cervix (19.7%) and breast (7.8%). Among males, 33.1% of all cancers were in the respiratory system followed by digestive organ cancers (23.2%). Among females, 28.4% cancers were related to the reproductive system, 22.8% to the respiratory system and 14.1% to digestive organs. The cancer pattern revealed by the present study provides valuable leads to cancer epidemiology in Nepal, particularly in the western region, and provides useful information for health planning and future research.

Key words: Cancer profile - Hospital based study - Nepal

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Introduction

Cancer, one of the most dreaded non-communicable diseases has become an important contributor to the global burden of diseases. According to the World Cancer Report 2003, approximately 10 million people are diagnosed with cancer annually worldwide and over 22 million people were suffering from cancer in the year 2000 (Stewart & Kleihues, 2003). The burden of cancer is growing, and cancer is one of the leading causes of death worldwide. From a total of 58 million deaths in 2005, cancer accounted for 13% of all deaths. More than 70% of all cancer deaths in 2005 occurred in low and middle income countries. Deaths from cancer in the world are projected to continue to rise, with an estimated nine million people expected to die from cancer in 2015 and 11.4 million in 2030 (WHO 2007).

Cancer brings tremendous social distress, physical & psychological suffering, hardship to patients and their relatives. All over the world efforts are on to prevent and control this disease (El-Akad et al., 1986). Information on epidemiology of cancer ie., incidence, prevalence,

pattern and high risk factors are essential to plan, implement, and to evaluate control of cancer. However these are not available for most of the less developed nations of the world, including Nepal. Nepal was ranked 136th among 177 countries in the Human Development Index and had a GDP index of 0.44 in 2005 (UN, 2005). The total land area of the country is 147, 181 sq kms and is bordered by China in the north, and India on all other sides. According to 2001 census, the population of Nepal was 23.15 million. The sex ratio was 997 males for 1000 females and because of high growth rate the population of the country is fairly young. About 39.3% of the total population is in the 0-14 year age group and only 6.5% are above 60 years of age; 81% of the economically active population is employed in the agricultural sector and 42% of the population is below the poverty line (HMG, 2003). By religion the population is predominantly Hindu at 80% followed by Buddhist at 10.7% and Muslim 4.2%. More than 83% of the total population is living in the rural areas and high school level education among males is 48.1% and among females 27.2%. The health infrastructure of Nepal is very poor and according to Nepal Living Standard

¹Department of Community Medicine, ³Department of Radiotherapy and Oncology, ⁵Department of Forensic Medicine and Toxicology, Manipal College of Medical Sciences, Pokhara, Nepal, ²Department of Radiotherapy and Oncology, ⁴Cancer Registry, Amrita Institute of Medical Sciences and Research Centre, Cochin, India. * For correspondence: Binu VS, Senior Grade Lecturer, Department of Statistics, Manipal University, Manipal, Karnataka, India Email: gangadharanp@aims.amrita.edu

Survey in 1996, only 41.4% of rural households have access to the nearby health institution within a short walking distance of half an hour (Hari et al., 2001).

The present study describes the pattern of cancer based on the cases that attended a tertiary care hospital in the Western Development Region of Nepal.

Materials and Methods

The Manipal Teaching Hospital (MTH), affiliated to Manipal College of Medical Sciences, a teaching institution listed in the 7th edition of WHO recognized medical schools is situated in Pokhara, Kaski district in the Western Development Region (WDR) of Nepal. This is the only medical institution providing cancer diagnosis and treatment facilities for the people residing in the WDR, which constitute about 20% of the total population of Nepal. The present hospital based retrospective study was conducted for the period 1st January 2003 to 30th May 2005. Cancer cases diagnosed by all methods or treated during this period were identified from the inpatient registers maintained by the Medical Records Department of MTH. The cases identified include all invasive cancers in ICD-10 categories C00 to C97; in situ carcinoma and precancerous lesions are excluded from the study. Medical records of identified cases were reviewed and information on date of diagnosis, primary site, histology, method of diagnosis and demographic data were retrieved. Duplicate cases were eliminated by crosschecking name, address, age, sex and hospital number of each patient. Data were entered and analyzed using SPSS 10.1 (SPSS Inc., Chicago, IL, USA) and relative frequencies were obtained.

Results

During the study period, 957 cancer patients had attended the various departments of MTH of which 496 (51.8%) were males and 461 (48.2%) females – sex ratio 1.1:1. The median age (and quartiles) of male and female patients was 63 years (54.3, 70) and 60 years (48, 68) respectively. The age and sex distribution of cases are shown in Figure 1. More than half of all cases were above 60 years of age and the maximum frequency was observed in 61–70 year age group in both sexes. In the middle age groups between 30 years and 61 years, the percentage of female cases were more than males and reverse frequency were observed in all other age categories. The majority

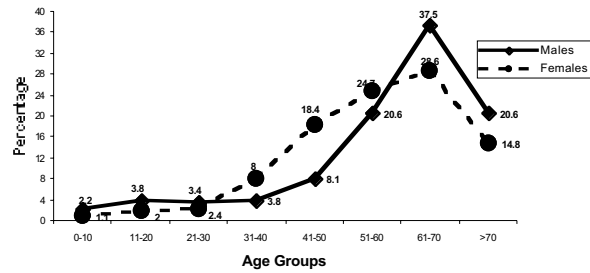


Figure 1. Percentage of Cases by Age & Sex

of patients belonged to WDR of Nepal and 50% of all cases were from Kaski district. The proportion of microscopically confirmed cases both from primary and metastatic sites was 87.5% (males 86.2% and females 89%), clinically or radiologically diagnosed 10% and for the remaining 2.5% cases, the method of diagnosis was not documented. Tobacco related cancer constituted 48% of all cancers among males and 28% among females; lung cancer was the major contributor in both sexes.

Figures 2 and 3 give the ten leading sites of cancer. Lung cancer was the leading cancer in both sexes –male 22%, female-20% followed by larynx among males – 9.8% and among females cervix was the second leading cancer site with 19.7%. Stomach cancer was the third leading site (9%) among males while it was fourth in females (7.2%); breast was the third leading site of cancer among females (7.8%).

Table 1 gives the system wise distribution of cases among males and females. Among males, 33.1% of all cancers were confined to the respiratory system followed by digestive organs (23.2%). Among females, 28.4% cancers were in the reproductive system and 22.8% were respiratory system cancers followed by digestive organ cancers (14.1%).

Discussion

Epidemiological information on cancer including the pattern is an important basis for determining the priorities for cancer control in any population group. There are marked differences in distribution of cancers in different regions of the world (Pisani, 1994). Environmental and socio-cultural factors such as active and passive tobacco smoking, use of nonsmoking tobacco, alcohol intake,

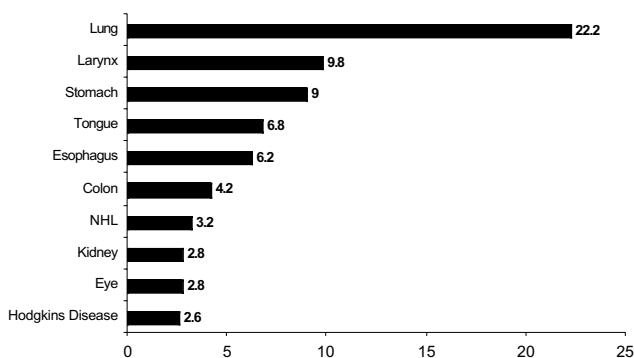


Figure 2. Ten Leading Cancer Sites - Males

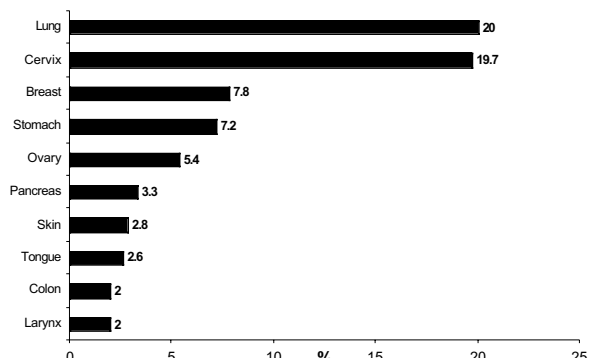


Figure 3. Ten Leading Cancer Sites - Females

Table 1. System-wise Distribution Among Males & Females

Site distribution	Male (%)	Female (%)
Lip, Oral cavity & Pharynx	44 (8.9)	22 (4.8)
Digestive Organs	115 (23.2)	65 (14.1)
Respiratory system	164 (33.1)	105 (22.8)
Bones, Joints & Articular cartilage	9 (1.8)	5 (1.1)
Skin	11 (2.2)	13 (2.8)
Soft tissue	7 (1.4)	9 (2.0)
Breast	-	6 (7.8)
Reproductive system	17 (3.4)	131 (28.4)
Urinary Tract	14 (2.8)	8 (1.7)
Eye, Brain & other parts of Central Nervous System	15 (3.0)	9 (2.0)
Thyroid & Other Endocrine Glands	4 (0.8)	8 (1.7)
Unknown Primary	44 (8.9)	26 (5.6)
Lymphoma & Hodgkin's Disease	29 (5.8)	10 (2.2)
Leukemia & Multiple Myeloma	21(4.2)	12 (2.6)
Ill-defined sites & Others	2 (0.4)	2 (0.4)
Total	496 (100)	461 (100)

exposure to ultraviolet rays, dietary factors, pollutants of air, water and soil etc. contribute for the development of different types of cancers (Stewart & Kleihues, 2003; Page & Asire, 1985; Satariano & Swanson, 1988). There is no reliable information about the incidence or pattern of cancer in the WDR of Nepal, and hence an attempt was made to find the cancer pattern in the region based on hospital data.

In the present study, the number of male patients was more than females and the median age of female patients was 3 years lower than males. The maximum frequency was observed in 61-70 year age group in both male and female patients. The proportion of cases diagnosed clinically or radiologically was only 10%. There is a possibility of under-registration of clinically diagnosed cases as some advanced cases, particularly in the elderly, may not be fully investigated in the hospital, or may be provided with symptomatic treatment in the out-patient department; as a result such patient's information will not be available in the inpatient register of medical records department.

Although a population-based National Cancer Registry does not exist, an earlier study of hospital based statistics from five major hospitals in Kathmandu valley in 2001 reported that lung cancer is the commonest cancer in Nepal (Joshi, 2003). The population based cancer registries in Manipur and Mizoram states of India reported lung cancer as the leading site of cancer among males and females (NCRP, 2006). In our study too, lung cancer was the leading site among both males and females. In most of the developing countries lung cancer has emerged as the leading cancer among males but not in females (Gaur et al., 2006; Urmi et al., 2002; Bhurgri et al., 2000). Several studies conducted in different populations showed tobacco smoking as the major risk factor for causation of lung cancer (Moore & Tsuda, 2002). The higher frequency of lung cancer among females in our study could be due to

higher prevalence of smoking among them compared to other developing nations. In a survey of tobacco users in Mumbai, India the prevalence of smokers was found to be 23.6% and 0.3% among males and females respectively (Gupta, 1996). For Nepal there is a paucity of data on the prevalence of smoking. According to WHO, prevalence of smoking among males and females is 39.5% and 23.8%, respectively (Strong & Bonita, 2003). Two independent studies from eastern Nepal reported a high prevalence of smoking among females as 15.4% and 12.9% (Niraula, 2004; Pandey, 1998). In particular, the survey among rural community of Nepal by Pandey et al showed that in the 20+ years age group 85.4% of men and 62.4% of women were tobacco smokers. The survey also reported a low percentage, 6.4% as tobacco chewers among women. Further in-depth studies are required to explore the other possibilities like indoor air pollution and exposure to environmental tobacco smoke, for the high frequency of female lung cancer in this region.

The second most common cancer among males was of the larynx, which was also one of the leading cancer sites in the neighbouring countries like India and Pakistan (Gaur et al., 2006; Urmi et al., 2002; Bhurgri et al., 2000). This can be attributed to higher prevalence of smoking and chewing tobacco among males compared to females. Among females, cancer cervix is the second leading cancer which was more than double in number compared to the third leading site breast. Cancer of uterine cervix and breast cancer are common cancers among women in most of the developing countries of the world. However in the developed countries breast cancer is the leading cancer in women (Stewart & Kleihues, 2003). Recent reports of registries from India has shown that in most of the urban registries breast cancer incidence has overtaken cervix cancer incidence (NCRP 2006) Risk factors like early age at marriage, early age at first coitus, early age at first childbirth, sex with uncircumcised men, multiparity, low socioeconomic status and poor genital hygiene are responsible for high incidence of cervix cancer in under-developed regions. Besides these risk factors, it has now been established that infection with the oncogenic subtypes of human papilloma viruses (HPV) is the necessary cause for cervical cancer (Hakama et al., 1986). Epidemiological studies conducted in various female populations have revealed association between reproductive and dietary factors such as early menarche, late menopause, high calorie intake, high total and saturated animal fat, diet poor in fruits and vegetables etc. with breast cancer (Stewart & Kleihues, 2003; Yeole, 2002; Jayalekshmi et al., 2006). There is a priority need for identification of risk factors among Nepali women for the control and prevention of these two cancers.

In our study, stomach cancer was the third leading cancer among males and fourth in females. The population based cancer registries in the north-eastern states (Mizoram and Sikkim) of India reported stomach cancer as one of the five leading cancers in both sexes (PBCR, 2006). According to International Agency for Research on Cancer (IARC), numerous epidemiological studies conducted throughout the world have identified a significant association between stomach cancer and

tobacco smoking (IARC, 2002). Besides this, many case control studies have identified dietary factors like inadequate intake of fruits and vegetables, excessive intake of alcohol and smoked or salted food as risk factors for stomach cancer (Gonzalez et al., 1991; Hoshiyama & Sasaba, 1992). Though the high frequency of stomach cancer may be due to the high prevalence of smoking in this population, the possibility of other risk factors like H.Pylori etc. has to be evaluated.

The findings of the present study should be taken cautiously and cannot be extrapolated for the entire nation due to referral and other biases regarding hospital data. Hence population-based cancer registries should be established within the region to ensure proper documentation and research on malignant diseases.

In conclusion, the cancer pattern revealed by the present study provides valuable leads to cancer epidemiology in the western region of Nepal. Tobacco control measures should be initiated to control and prevent the high incidence of tobacco related cancers especially lung cancer. Suitable methods for early detection of cervix cancer like Pap smear testing should be organized on a wider scale for controlling this disease. In the absence of population based registries, and where incidence and mortality figures are not available, studies like the present one may provide useful leads for health planning and future research.

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