

RESEARCH COMMUNICATION

Spectrum of Malignancies in Allahabad, North India: A Hospital-based study

Ravi Mehrotra*, Shruti Pandya, Meenakshi Singhla, Divya Srivastava, Mamta Singh

Abstract

Objective: To study the spectrum of malignancies in the Allahabad region of North India. This was a hospital based analysis of malignancies from January 1991 to October 2006. **Materials and Methods:** The basic information in the cancer registry included data on personal identification, demographic characteristics, diagnosis, primary site and morphology of tumours. The basis of diagnosis was histological examination of the biopsy material. **Results:** Total of 58,031 biopsies were examined, out of which 3,133 (5.4%) were diagnosed as malignancies. Of these, 1,893 (60.4%) patients were males and 1,240 (39.6%) were females, yielding a male: female sex ratio of 1.5:1. The majority of cases (2,772, 88.5%) were above the age of 30, with predominance at 41-50 years of age group (804, 25.6%). Most commonly reported tumours were those of oral cavity (370; 11.8%), oesophagus (267; 8.5%), stomach (239, 7.6%), oropharynx (207, 6.6%), cervix (192, 6.1%), breast (190, 6.0%), larynx (101, 3.2%), skin (81, 3.2%), prostate (77, 2.4%) and the urinary bladder (66, 2.1%). **Conclusions:** It is concluded from this retrospective study of tumours reported at this hospital over 16 years, that oral and oropharyngeal malignancies were the commonest malignancies in men, while in females, carcinoma of cervix and breast were the most frequent.

Key Words: Spectrum of malignancies - hospital/pathology-based - Allahabad, North India

Asian Pacific J Cancer Prev, 9, 525-528

Introduction

Malignancies constitute the foremost public health problem in the world, especially keeping in view the aging population. The last UICC World Cancer Congress forecasted that by the year 2020, more than 16 million new cancer cases and 10 million cancer deaths are expected annually (World Cancer Declaration, 2006). A recent study showed that neoplasia of the lung (12%), breast (11%), bowel (9%), stomach (9%) and prostate (6%) accounted for almost half of all cancers diagnosed in the world. The mortality rates of malignancies are likely to increase up to 70% in developing countries (<http://info.cancerresearchuk.org>, 2008). The overall study of cancer prevalence in different social groups revealed that the burden of malignancy is highest in affluent societies, mainly due to a high incidence of tumours associated with smoking and lifestyle, like neoplasia of the lung, colorectum and breast (Stewart and Kleihues, 2003).

Cancer registration is a mechanism to collect and classify information on all malignant cases in order to produce statistics on the occurrence of cancer and to provide a framework of assessing and controlling the impact of cancer on the community. This is an active method of data collection, with information from hospital records as well as through interviews of patients. The data

from the cancer registries helps in highlighting the magnitude and common sites of cancer, and is useful in planning National Cancer Control Programmes.

In India, the National Cancer Registry Programme (NCRP) was introduced in 1982, under the auspices of the Indian Council of Medical Research (ICMR). It provides data on incidence rates of different cancers (<http://www.icmr.nic.in>, 2008). Recent studies have reported that approximately 0.8 million new cancer cases are reported every year in India (Reddy et al., 2005). Registries under the NCRP have shown geographical differences in patterns of cancer. Cancer of the gall bladder has comparatively a much higher incidence rate in population based cancer registry (PBCR) at Delhi and Bhopal, whereas carcinoma of the stomach has been a consistent leading site of cancer in males at Chennai and Bangalore (NCRP-ICMR, 2001 and 2002). The Kolkata cancer registry provided information of cancer profile in Eastern India and reported that gall bladder was the 3rd leading site of malignancy (Sen et al., 2002). The cancer atlas of India was recently developed to increase the knowledge of geographic patterns of the cancer in the country.

Allahabad is one of the largest districts of the State of Uttar Pradesh in North India and has an area of about 65 km² and is 98 m/340 ft above sea level with population of



Figure 1. Map of Uttar Pradesh

1,042,229 as per the 2001 census. It is located in the southern part of the state, at 25°28-N, 81°50-E6 (Wikipedia, 2007). It is a central eastern district of Uttar Pradesh (U.P) with Pratapgarh, Fatehpur and Jaunpur in its north, Varanasi and Mirzapur in the east, Rewa (M.P) in the south and Banda in the west. (Figure 1) The prevalence rate of cancer is very high in this region and the bulk of patients come from the surrounding areas to the tertiary level referral Swaroop Rani Nehru Hospital of Moti Lal Nehru Medical College, Allahabad, However, cancer registry data have thus far not been reported from this area.

Materials and Methods

This is a retrospective analysis of malignant tumours studied in the Department of Pathology at M.L.N Medical College, Allahabad during a sixteen-year period between January 1991 to October 2006. The basic information of cancer registry included data on personal identification, demographic characters, diagnosis, primary site and morphology of tumours. The basis of diagnosis was histological examination of the biopsy material.

Results

A total of 58,031 biopsies were examined, out of which 3,133 (5.4%) were diagnosed as malignancies. Of these 1,893 (60.4%) were males and 1,240 (39.6%) were females with a sex ratio of 1.53:1 (Figure 2). Most commonly reported tumours were those of oral cavity (370; 11.8%), oesophagus (267; 8.5%), stomach (239; 7.6%), oropharynx (207; 6.6%), cervix (192; 6.1%), breast (190; 6.0%), larynx (101; 3.2%), skin (81; 3.2%), prostate (77; 2.4%) and the urinary bladder (66; 2.1%). Most cancers in both sexes were in the 41-50 age group (see Figure 3).

In males (1,893; 60.4%), the ten leading sites of cancer were oral cavity (266, 14.0%), oesophagus (177, 9.3%),

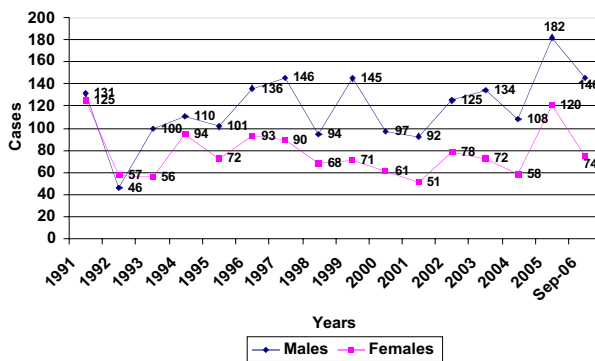


Figure 2. Year and Sex-wise Distribution of Cancers

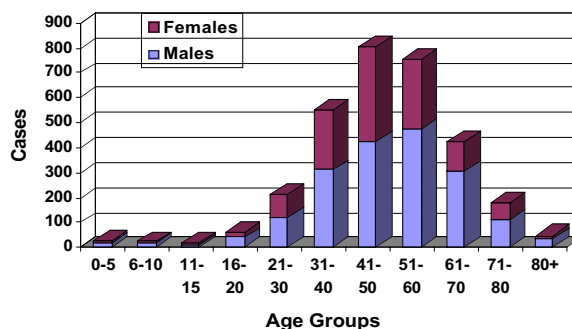


Figure 3. Age and Sex Distribution of Cancers

oropharynx (177, 9.3%), stomach (155, 8.2%), larynx (90, 4.7%), prostate (77, 4.1%), penis (63, 3.3%), skin (55, 2.9%), urinary bladder (53, 2.8%), and the rectum (31, 1.6%) (Figure 4). Details of the oral cavity malignancies have already been published (Mehrotra et al., 2008)

In females (1240, 39.6%) cases, ten leading sites of cancer were cervix (192, 15.4%), breast (190, 15.3%), oral cavity (104, 8.4%), oesophagus (90, 7.2%), stomach

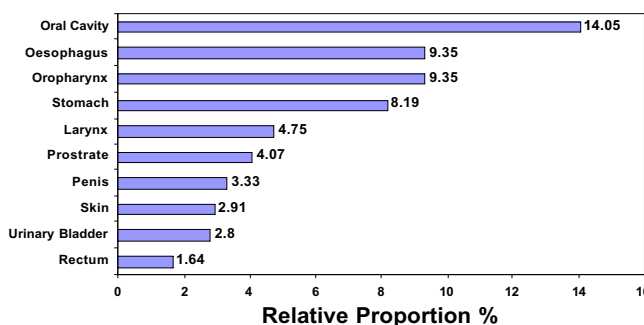


Figure 4. Ten Leading Cancers in Males

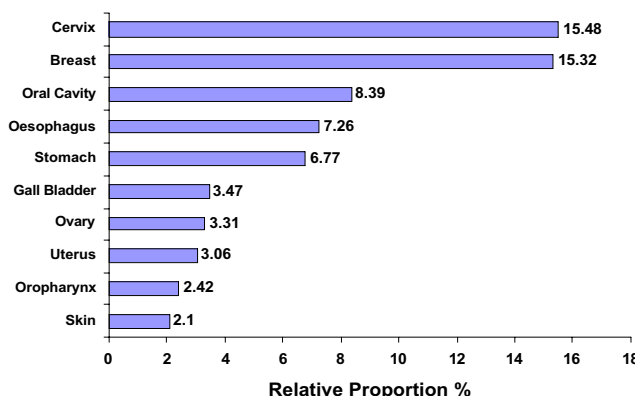


Figure 5. Ten Leading Cancers in Females

(84, 6.7%), gall bladder (43, 3.4%), ovary (41, 3.3%), uterus (38, 3.0%), oropharynx (30, 2.4%), and skin (26, 2.1%) (Figure 5).

Most of the cervical cancer cases were reported in the age group of 30-60 years (155, 80.7%), with predominance at 41-50 years of age. Out of the total 192 cases, 187 (97.3%) were squamous cell carcinoma and only 5 (2.7%) cases were reported as adenocarcinoma. Majority of cases of SCC were moderately differentiated subtype (88, 47.0%). Among SCCs, 119(63.6%) were keratinizing type, 44(23.5%) were of non-keratinizing type, 17 (9.1%) were large cell type and 7(3.7%) were small cell type.

Malignancy of the cervix was closely followed by breast carcinoma (190,15.3%) with a majority of cases reported in the age group 31-60 years (148, 77.8%), and the maximum number in 41-50 years of age (67, 35.3%). Ductal carcinoma was the most common histological subtype (168, 88.4%) followed by lobular carcinoma (12, 6.3%).

In both the sexes, the most common site among all gastrointestinal malignancies was the oesophagus (9.3% in males and 7.2% in females) with squamous cell carcinoma (91.4%) being the commonest histological subtype. This was followed by gastric cancer (32.8%) in which adenocarcinoma (73.6%) was the most common histological type.

Malignancies of the skin comprised 81(2.6%) of all the malignancies with male to female ratio of 2.3:1. Most of them were squamous cell carcinoma (70.3%). The other malignancies of skin included basal cell carcinoma (16%) and malignant melanoma (9.8%).

Seventy seven (2.4%) prostatic malignancies were received, of which 73(95%) were adenocarcinoma and 2 (2.5%) each were small cell carcinoma and transitional cell carcinoma. Most of the cases were above the age of 40 years with predominance at 61-70 years of age group. Carcinoma of the urinary bladder comprised 66 (2.1%) of all the cancers in the study, of which 53 (80.3%) were males and 13 (19.7%) were females. Histologically, 62 (93.9%) were transitional cell carcinomas.

Discussion

India is a vast country and therefore the spectrum of malignancies varies from place to place due to the differences in environment, nutritional diet, social and religious customs.

Registries from Mumbai, Bangalore, Chennai, Thiruvananthapuram and Dibrugarh, showed the number of cancer registered were 51,146; 24,229; 25,009; 26,172 and 2532 respectively, in the period of 3 years from January 2001 to December 2003. Maximum number of patients were registered in Mumbai, comprising 28,471 (55.7%) males and 22,675 (44.3%) females with a sex ratio of 1.27:1. In this study, the number of cancers registered over 16 years were 3,133 of which 1893 (60.4%) were males and 1240 (39.6%) were females with a sex ratio of 1.5:1. This is akin to the data from Dibrugarh (1.77:1) (Ferlay et al., 2004) and Mumbai. A higher male: female ratio in this study could be due to a higher percentage of male patients reporting to health care centers

and on the other hand, lack of awareness, low literacy rate and relative negligence towards health of females in this part of the country. The number of malignancies that were diagnosed were comparatively less vis-à-vis the total number of biopsies received in the Pathology department, presumably due to the fact that many patients with overt or advanced malignancy could have been directly referred to a neighbouring cancer hospital for further investigations and treatment.

Results of the present study showed that majority of the leading cancers in this region were associated with certain customs, dietary habits and addictions. Carcinoma of oral cavity, oesophagus, stomach, oropharynx, larynx and urinary bladder which comprise more than 50% of all malignancies in males and a considerable percentage in females may be related to tobacco chewing or smoking. Similarly a high incidence of cancer of the cervix in this region may be related to early marriage, poor hygiene, multiparity, illiteracy and low socioeconomic status. Interestingly, the nearly equal prevalence in cervix and breast malignancies, is akin to more developed and affluent cities like Mumbai. This could be attributed to increasing urbanization of this part of the country. Tumours of the lung and colon are relatively under-represented due to the fact that biopsies of these sites are rarely done due to the dearth of therapeutic facilities. All attempts were made to prevent duplicate counting of cases, by examining hospital records and correlating with pathological data. The data from this registry may, of course, be skewed due to the individual strengths and weaknesses of the various departments of the hospital, individual socio-cultural determinants of access to care, and those related to the health infrastructure serving the territory.

The knowledge of these epidemiological factors and geographic distribution can therefore guide policies play a role in initiation of proper control measures, education, screening programs, early diagnosis and treatment of malignancy at a very early stage. Properly structured site specific data like this can augment available information and is an essential indicator of the magnitude and the pattern of the cancer problem in India. To the best of our knowledge, apart from Delhi, this is the only institution in Northern India from where hospital based data on cancer prevalence have been reported and represents the common cancer patterns in this part in the country.

Acknowledgement

The authors gratefully acknowledge help from Dr PC Gupta in reviewing the manuscript.

References

- Chiller KG, Washington C, Sober AJ, Koh HK. (2005) Cancer of the skin. In: Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, editors. *Harrison's Principles of Internal Medicine*. 16th ed. USA: McGraw-Hill. 497-503.
- Commonly diagnosed cancers worldwide. Available at: <http://info.cancerresearchuk.org/cancerstats/geographic/world/commoncancers/?a=5441> Accessed Feb 21, 2008
- Ferlay J, Bray F, Pisani P, Parkin DM. *Globocan 2002*. (2004) Cancer incidence mortality and prevalence worldwide IARC

- Cancer base No-5 Version 2, IARC press, Lyon, (<http://www.dep.iarc.fr>) <http://mohfw.nic.in/kk/95/i9/95i90e01.htm>. accessed Feb 24, 2008 http://www.icmr.nic.in/ncrp/cancer_reg.htm. accessed Feb 24, 2008
- Mehrotra R, Singh M, Gupta RK, Singh M, Kapoor AK (2005) Trends of prevalence and pathological spectrum of head and neck cancers in North India. *Indian J Cancer*, **42**, 89-93.
- Mehrotra R, Pandya S, Chaudhary AK, Kumar M, Singh M (2008) Prevalence of oral pre-malignant and malignant lesions at a tertiary level hospital in Allahabad, India. *Asian Pacific J Cancer Prev*, **9**, 263-66
- Nandakumar A, Gupta PC, Gangadharan P, Visweswara RN (2004) Development of an atlas of cancer in India. A project of National cancer registry programme (ICMR). First all India report: 2001-2002. Bangalore: NCRP (ICMR).
- Nandakumar A (2001) Project officer. Consolidated report of the population based cancer registries incidence and distribution of cancer: 1990-1996. Bangalore: NCRP (ICMR).
- Nandakumar A (2007) Project officer. Consolidated report of the Hospital based cancer registries- An assessment of the burden and care of cancer patients. 2001-2003 NCRP (ICMR).
- National cancer Registry programme (NCRP-ICMR). (2002) Two years report of the population cancer based registries 1997-98. Bangalore: NCRP.
- National cancer Registry programme (NCRP-ICMR). (2001) Population based cancer registry (PCRB) reports 1990-96. Bangalore: NCRP.
- Ray A, Mitra AB. (2003) Estrogen and breast cancer. In: Medappa N editor. ICMR bulletin. New Delhi: ICMR. 33(2) Available at: <http://www.icmr.nic.in/buFebruary03.pdf>
- Reddy KS, Shah B, Varghese C, Ramadoss A (2005) Responding to the threat of chronic diseases in India. *Lancet*, **366**, 1746-51.
- Scher HI, Motzer RJ. (2005) Bladder and renal cell carcinoma. In: Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, editors. Harrison's Principles of Internal Medicine. 16th ed. USA: McGraw-Hill, 539-543.
16. Sen U, Sankarayanan R, Mandal S, et al (2002). Cancer pattern in eastern India: The first report of Kolkata cancer registry. *Int J Cancer*, **100**, 86-91.
- Stewart BW, Kleihues P (2003). The global burden of cancer. (Eds): World Cancer Report. IARC Press. Lyon . Available at www.iarc.fr/IARCpress/pdfs/wcr/wcr-1.pdf.
- Wikipedia contributors. Geography, Demography and Climate of Allahabad. Wikipedia, The Free Encyclopedia. June 19, 2007, 07:59 UTC. Available at: [http://en.wikipedia.org/w/index.php?title=Geography%2C Demography And Climate of Allahabad &oldid=139156322](http://en.wikipedia.org/w/index.php?title=Geography%2C%20Demography%20And%20Climate%20of%20Allahabad&oldid=139156322). Accessed June 21, 2007
- World Cancer Declaration, UICC World Cancer Congress July 8-12, 2006 Washington D.C, USA. Available at: <http://www.2006conferences.org/u-declaration>