

RESEARCH ARTICLE

Pattern and Trends of Cancer in Odisha, India: A Retrospective Study

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Abstract

The burden of cancer is growing globally and is one of the top leading causes of death. Information on cancer patterns are essential for effective planning of cancer control interventions. There is limited published information available on pattern of cancer for the state of Odisha, India. The present study was an attempt to explore the pattern and trend of cancer in Odisha. To fulfill the objectives retrospective data available from 2001-2011 at Acharya Harihar Regional Cancer Center (AHRCC), Cuttack, Odisha, were analyzed. Medical records of cancer patients were reviewed and relevant information on diagnosis, primary site and demographic data were retrieved. Data were entered and analyzed using SPSS 16.0 (SPSS Inc.). A total of 74,861 cancer inpatients were registered at AHRCC for the years 2001-2011. The proportion of females outnumbered males with female: male ratio 1.1:1. The number of female cases increased four folds and that of males three fold over the period studied. Malignancies such as oral cancer (16.93%), acute lymphocytic leukemia/non Hodgkins lymphoma (14.09%) and cancer of gastrointestinal tract (21.07%) are leading cancers among males and carcinomas of breast (28.94%), cervix (23.66%) and ovary (16.11%) were leading among females. Findings from this study indicate an overall increase in cancer reporting which could be regarded as proxy measure for overall cancer situation in Odisha. There is scope and need for integrating other government hospitals, existing private health service providers and research institutions across the state for better planning of cancer control program.

Keywords: Malignancies - Odisha, India - breast cancer - oral cancer - cervical cancer - ALL/NHL

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Introduction

Epidemic of cancer has transited beyond the geographical boundaries of countries. The globe is under the clutch of this dreadful disease which is spreading rapidly. Nevertheless it is a challenge for any health care system. Every year nearly 10 million people are being diagnosed with cancer out of which about 6 million die per year (Khanna, 2005). Though cancer prevalence in India is less compared to developed countries, it has increased grossly during past few decades. On an average 0.7 million new cases are being diagnosed every year adding to the prevalence of 2.5 million from which half of the patient dies within few years. Over 70% of the cases report for diagnosis and treatment in advanced stages of the disease, resulting in poor survival and high mortality rates (Dinshaw et al., 1999).

Globally lung, stomach and colorectal cancers are the leading cancers in males, whereas, breast, lungs and stomach cancer constitute top three leading cancers in females (WHO, 2004). In contrary the common sites for cancer in India are oral cavity, lungs, esophagus and stomach in males and cervix, breast and oral cavity

among females (Rao et al., 2002). Even within India there exist variations in the prevalence and pattern of different cancers.

In southern India the common cancers among male were found to be stomach, oral, esophagus and leukemia whereas females were mainly affected by cervix, breast, oral and esophageal cancers (NCRP, 1996; Jagannatha et al., 2005; Reddy, 2010). Similarly, a study (Maiti et al., 2012) from West Bengal, an eastern state of India has reported head and neck, lungs and oral cancers are major in males, whereas among female breast cancer was leading followed by cervical and stomach cancers. In contrast, among north Indian males gastro intestinal tract, larynx and lung are major cancers and among females breast, cervix and lung were leading malignancies (Sharma et al., 2012). More so, the analysis from PBCRs in the country has shown that there is significant increase in trends of mouth, liver and NHL cancers among males over period of time (NCRP, 2009). These differences in the prevalence of cancers across the country could be due to diversity in gene pools as well as the environmental dynamics.

There is need of obtaining more clear information on cancer epidemiology such as prevalence, incidence and

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risk factors in order to generate evidences for effective decision making to prevent and control the cancer epidemic in the country. There is very limited published cancer data available in the state of Odisha; sporadic studies have shown that there is increased number of cancer cases over last few years. Keeping in view the existence of diverse pattern of cancer occurrence, present study was conducted to explore the pattern and trend of cancer among inpatients admitted to the regional cancer center in the state.

Materials and Methods

The present retrospective study was carried out in Acharya Harihar Regional Cancer Centre (AHRCC), Cuttack, Odisha which is one of the Regional Cancer Centers in India and contributing to development of cancer atlas in India. Being a leading medical institution in the state it provides cancer diagnosis and treatment facilities for the people of Odisha as well for the neighboring states; it also offers teaching and training to both medical undergraduates and post-graduates. The present hospital based retrospective study was conducted for the period 1st April 2012 to 30th June 2012. Patients reported from January 2001 till 31st December 2011 were included in the study. New cancer cases diagnosed by all methods or treated during this period of 1st January to 31st December 2011 were identified in detail from the inpatient registers maintained by the Medical Records Department of AHRCC. From 2001-2007 the classification was according to ICD-9 where as from 2008 onwards ICD-10 classification was followed for reporting of the cases in medical records department. The cases identified include all invasive cancers in ICD-10 categories C00 to C97; Medical records of identified cases were reviewed and information on diagnosis, primary site and demographic data were retrieved. Duplicate cases were eliminated by cross-checking name, address, age, sex and hospital number of each patient. Data were entered and analyzed using SPSS 16.0 (SPSS Inc.) and relative frequencies were obtained, graphs were plotted. To have an uniformity in the available data and for the purpose of understanding

trend in cancer cases at AHRCC classification was done as per ICD-09 as shown from the year 2001 till 2011. Exploratory analysis for site specific malignancies was done from the year 2008-2011 in both sexes. Year 2007 was excluded from the analysis because of unavailability of gender specific information.

Ethical considerations

This study was approved by Institutional Ethical Committee of Indian Institute of Public Health, Bhubaneswar and necessary permission from AHRCC was also obtained.

Results

A total 74,861 cancer inpatients were registered at AHRCC from 2001 till 2011. After excluding the figure of 2007, 66,941 cases reported to AHRCC among which proportion of females (52.8%; 95%CI 52.35-53.11%) were more than males (47.2%; 95%CI 46.89-47.65%). The number of cancer inpatients has increased grossly from 3023 in 2001-02 to 10,573 in 2011, while among males the increase was more than three folds from 1,416 (2001-02) to 4,770 (2011) and for female cancer patients it was four folds from 1,507 (2001-02) to 5,803 (2011).

Trends of cancer reported to AHRCC showed that there is increase in reporting of all type of cancer from 2001-2011 among males except neoplasm of respiratory organs, intra thoracic organs, bone and connective tissue (Figure 1). Cancers of oral cavity are the leading type of cancer among males since 2008 followed by malignancies namely Acute Lymphocytic leukemia, Non Hodgkins Lymphoma, stomach and liver (Figure 2). In the year 2011 cancer of rectum, colon and Hodgkins lymphoma contributed in notable proportions (Figure 1). Amongst males greatest variation was observed in ALL/NHL, liver and gall bladder with additional 4.5% and 1.18% respectively. There is increase in number of breast, cervix uteri and ovary cancers among female from 2001-2011 (Figure 2). Cancers of stomach, rectum, ALL/NHL and Hodgkins lymphoma are added to the list of sites in the year 2011. There was gross increase of 3.1% cervix uteri

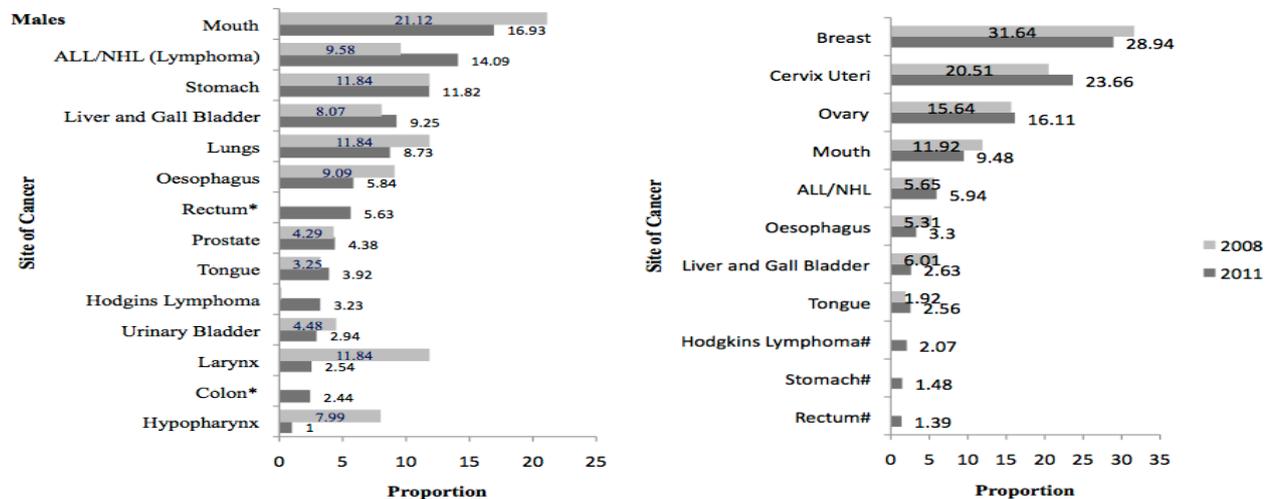


Figure 1. Distribution of Cancer Proportion According to Sites in the Year 2008 and 2011. *Data missing for the year 2008, #Proportion <0.05

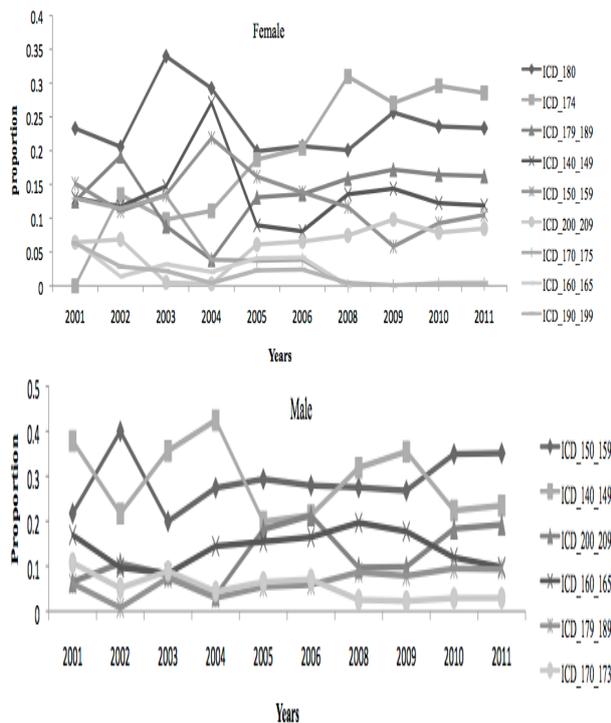


Figure 2. Trends in Cancer Proportions Reported to AHRCC from the Year 2001 to 2011. ICD-9 Classification (ICD 1975, WHO), ICD 140-149: Malignant neoplasm of Lip, Oral cavity and Pharynx, ICD 150-159: Malignant neoplasm of Digestive organs and peritoneum, ICD 160-165: Malignant neoplasm of Respiratory and Intra thoracic organs, ICD 170-175: Malignant neoplasm of Bone, connective tissue, skin, ICD 174: Malignant neoplasm of Breast, ICD 179-189: Malignant neoplasm of genitourinary organs, ICD 180: Cervix Uteri, ICD 200-209: Malignant neoplasm of lymphatic and Hematopoietic tissue

cancers observed among females from 2008-2011.

Discussion

In the present study it was observed that more number of females reported to AHRCC in comparison to males with a ratio of 1:1.1, which is comparable with that of cancer incidence in South-East Asian region (IARC, 2008). The trend is almost reverse to global trend (IARC, 2008), which may be due to the fact that Indian females are at a higher of risk of getting cancer as compared to males (IARC, 2008; ICMR, 2010) and this could be attributable to reproductive risk factors among Indian females have and recent lifestyle changes in Indian communities.

Mouth is the leading site of cancer among males (16.93%) followed by ALL, NHL together (14.09%). Data from different population based cancer registries (PBCR) has also shown oral cavity cancer as leading cancer (NCRP, 2008). A rising trend in mouth cancer was observed in Mumbai and Delhi PBCR among male where among female trend was reverse (NCRP, 2009). This cancer could be attributed to increase in tobacco consumption among males in any form (Murthy et al., 2004). The prevalence of smokeless tobacco was 56% in Odisha (MOHFW, 2010) which indicates the possibility of tobacco related cancers to be more. In our study the

prevalence of oral cancer in the year 2011 is less than the prevalence of 2008 (Figure). We assume the decrease in cases could be due to diversification of cases towards other health care centers established in the state within recent years. A gross increase of 4.5% ALL and NHL cancers reported in our study from 2008-2011 need further research to establish the reason for the same. Report from national cancer registries in India documented significant increase of NHL in all five urban PBCRs varying from 1.0-7.9% (NCRP, 2009). Cancer of liver and gall bladder found to have increased in numbers from 2008-2011. Four PBCRs at Bangalore, Chennai, Delhi and Mumbai experienced significant increase in liver cancer by 1.6-2.6% from 1997 till 2005. (PBCRs ;ICMR, 2010). Prevalence of stomach cancers were unchanged over time in our study which was similar to the report from cancer registries of Bangalore and Delhi (NCRP, 2009).

Among female, breast cancer is the leading site of cancer followed by cervix uteri and ovary. Breast cancer is commonest cancer and a leading cancer among female around the world. Recent reports of PBCRs from India have shown that in most of the urban registries breast cancer incidence is more than cervix cancer (ICMR, 2010). All urban registries at India showed increase trend in breast cancer among females (NCRP, 2009). Epidemiological studies among female population have identified factors such as early menarche, late menopause, high calorie intake, high intake of saturated fats and less vegetables and fruits consumption were associated with breast cancer (Stewart et al., 2003; Jayalakshmi et al., 2006; Yeole, 2008). In our study second most cancer among female was cervix with grossly 3.1% increase, which is quite contrary to reports from PBCRs across India (NCRP, 2009). This increase in proportion could be due to the risk factors like early marriage, early age at first coitus and first birth, low socioeconomic status, poor genital hygiene and human papilloma virus (HPV) are necessary cause for cervical cancer (Hakama et al., IARC). A study conducted in suburban area of Odisha reported low awareness on cervical cancer compared to breast cancer among Odiya females which, could be the reason for reporting of more breast cancers (Pati, 2004). In our study increase in Ovarian cancer, 3rd leading among female is congruent with findings from northern India (Sharma et al., 2012).

We observed that wider variance of rectum, tongue and colon cancer in our study is quite comparable with change in incidences reported from different population based cancer registries of India. (NCRP, 2009)

Findings from this study indicate an overall increase in cancer reporting, which could be a proxy measure for overall cancer situation in Odisha, though it cannot be extrapolated for the entire state. chances of missing cases, which could be better documented through population based registry cannot be ruled out.

Future implication for policy and program: There is also need of research to understand the culture, lifestyle and other factors for cancer because of diversity of the reasons. Development of electronic database, integration of private, government hospitals and academic research organizations and application of GIS can be helpful in

understanding the distribution of the disease in the state.

Our study also highlights the need for reinforcement and energizing of existing tobacco control effort since there has been a voluminous increase in tobacco related cancers in Odisha. Program directed at increasing awareness and hospital as well community based screening can help to identify breast cancer and cervix cancer at early stage. Frontline health workers could be explored as a channel for disseminating cancer education at the community, fostering their work with basic skills and knowledge for risk factor recognizing and timely reporting.

References

- Cancer Mortality, The Global Burden Of disease 2004 Update, World Health organization. (2004). Retrieved from http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf
- Dinshaw K, Rao D, Ganesh B (1999). Tata Memorial Hospital Cancer Registry Annual Report, Mumbai, India.
- Hakama M, Miller A, NE Day (n.d.). Screening for cancer of the uterine cervix. IARC publication no 145.
- ICMR, Development of an Atlas of Cancer in India, A project of national Cancer Registry Programme. (n.d.). Retrieved from http://www.ncrpindia.org/Cancer_Atlas_India/map.htm last accessed on 10th October 2012
- International Agency for Research on Cancer (2008). WHO, World Cancer Report 2008. Retrieved from <http://www.iarc.fr/en/publications/pdfs-online/wcr/> last accessed on 23rd September 2012
- Jagnnatha G, Hiremath S (2005). Oral Cancer Prevalence and assessment of various risk factors among Oral cancer patients attending Kidwai Memorial institute of oncology- An epidemiological study. Retrieved from <http://hdl.handle.net/123456789/2652> last accessed on 2nd November 2012
- Jayalakshmi P, Gangadharan P, Mani K (2006). Cancer in women in Kerala- a transition from a less developed state. *Asia Pac J Cancer Prev*, **7**, 186-90.
- Khanna P, Singh A, Kaushal V (2005). Smoking and cancer. *Radiation Oncology*, **5**, 12-7.
- Maiti P, Jana U, Ray A, et al (2012). Patterns of cancer occurrence in different regions of west Bengal- a hospital based study, *J Indian Med Assoc*, **110**, 445-8.
- Ministry of Health and Family Welfare (MOHFW), Government of India. (2010). Global Adult Tobacco Survey (GATS) India 2009-2010. New Delhi.
- Murthy N, Mathew A (2004). Cancer epidemiology, prevention and control. *J Curr Sci*, **86**, 518-26.
- National Cancer Registry Program, ICMR. (1996). Population based cancer registries consolidated report (1990-96). Available at <http://www.icmr.nic.in/ncrp/pbcr.pdf> Last accessed on 11th October 2012
- National Cancer Registry Program, ICMR. (2009) Time trends in cancer incidence rates 1982-2006. Available at http://www.ncrpindia.org/Reports_Publi/Preliminary_Pages_Trend.pdf Last accessed on 19-December 2012
- Pati S (2004). A study of the awareness of screening procedures for cervical cancer (pap smear) amongst health service users in a suburb area of Bhubaneswar, Orissa, India. Presented at 1st International Cervical Cancer Congress, Bhubaneswar, India, 2004.
- Rao Y, Gupta S, Agrawal S (2002). National cancer control program: current status and strategies. fifty years of cancer control in india. Director general of health services, MOHFW, Government of India 2002;41-7.
- Reddy K (2010). Cancer epidemiology in South India. Bangalore: Department of Epidemiology and Statistics Bangalore cancer registry. Kidwai Memorial Institute of oncology. Retrieved from <http://kidwai.kar.nic.in/statistics.htm> last accessed on October 24th 2012.
- Sharma MK, Gour N, Pandey A, Wallia D, Kislay D (2012). Epidemiological trends of cancer morbidity at a government medical college hospital, Chandigarh, India. *Asian Pac J Cancer Prev*, **13**, 3061-4.
- Stewart BW, Klehues P (n.d.). World cancer report, 2003. IARC. Retrieved from <http://www.iarc.fr/en/publications/pdfs-online/wcr/2003/wcr-cover.pdf> last accessed on October 15th 2012.
- Yeole BB (2008). Trends in cancer incidence in female breast, cervix uteri, corpus uteri, and ovary in India. *Asian Pac J Cancer Prev*, **9**, 119-22.