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 patients dies within few years (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 patients dies within few years (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 patients dies within few years (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 patients dies within few years (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 patients dies within few years (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 patients dies within few years (Khanna, 2005).
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 Harhir 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 till 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
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 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

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**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 neoplasms of Lip, Oral cavity and Pharynx, ICD 150-159: Malignant neoplasms of Digestive organs and peritoneum, ICD 160-165: Malignant neoplasms of Respiratory and Intra thoracic organs, ICD 170-175: Malignant neoplasms of Bone, connective tissue, skin, ICD 174: Malignant neoplasms of Breast, ICD 179-189: Malignant neoplasms of genitourinary organs, ICD 180: Cervix Uteri, ICD 181: Uterine corpus, ICD 182: Vagina, ICD 183: Ovary, ICD 184-189: Malignant neoplasms of Hematopoietic system, ICD 190: Malignant neoplasms of central nervous system, ICD 191: Malignant neoplasms of skin, ICD 192: Malignant neoplasms of nervous system, ICD 193: Malignant neoplasms of Endocrine organs.**
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


