Trends of Cancer Incidence in Nepal in the Period 2003-2012

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Abstract

Trends in cancer incidence is a key tool to identify the pattern of cancer of any country. This retrospective study was performed to present the trends of change in cancer incidence in Nepal. The total number of cancer cases in males was 26,064 while the total number of females cancer cases was 29,867 throughout the 10 years from 2003 to 2012. The cancer incidence per 100,000 in males was 12.8 in 2003 and 25.8 people in 2012. Similarly, in females, the crude incidence rate was 15.1 in 2003 and 26.7 per 100,000 in 2012. Cancer incidence was low at early age but it was increased with age in both sexes in Nepal. Lung cancer was the most common cancer in males throughout, while it was the third most common cancer in females. Cervix uteri was the most common site of cancer in females throughout the 10 years, with a clear trend for increase in breast cancer within this time.

Keywords: Cancer incidence data - organ sites - gender - trends - Nepal

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Introduction

The first hospital based cancer registry was established in Nepal in 2003. There were 1488 male cancer cases and 1763 female cancer cases out of 3251 cancer cases in 2003 in Nepal (Cancer Registry Report, 2003). The purpose of this study was to evaluate the 10 years (2003 to 2012) incidence rates and trends of cancer by years, age and sites in males and females of Nepal in order to assist in the field of cancer epidemiology and cancer statistics. Former studies by Pun et al. (2015) and Pradhananga et al. (2009) had also used the national cancer registry data but only showed the cancer cases by age. Due to non-existence of population based cancer registry in Nepal in order to assist in the field of cancer epidemiology and cancer statistics. Former studies by Pun et al. (2015) and Pradhananga et al. (2009) had also used the national cancer registry data but only showed the cancer cases by age. Due to non-existence of population based cancer registry (Pun et al., 2015; Pradhananga et al., 2009), we had taken the population (denominator) from the census and cases from the hospital.

Materials and Methods

Data were collected by National Cancer Registry programme from B P Koirala Memorial Cancer hospital, Bhaktapur cancer hospital, Bir hospital, TU teaching hospital, Kanti children hospital, BP Koirala institute of health science and Manipal teaching hospital. The cancer cases registered under the national cancer registry programme from 2003 to 2012 were taken for our study. We had added the cancer cases together within categories as per international classification of disease for oncology (ICD-10) published by international agency for research on cancer/ world health organization (IARC/WHO). This was done to make the number comparable with all the reports. All double/multiple entry cases were excluded in the study (National Cancer Registry Report, 2012).

The total cancer cases were 56013 from 2003 to 2012 and we excluded 82 cases because of missing age data. We analyzed 26064 male cases and 29867 female cases which had known age. The collected data were entered in Excel Sheet with respect to years, sex and sites. The population growth rate from 2001 to 2011 published on population monograph of Nepal volume 1 and the Census population of 2001 and 2011 were used to predict the population of Nepal of 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2012 (Population Monograph of Nepal, 2014). World population was taken from Cancer Registration: Principles and methods (Jensen et al., 1991).

The crude incidence rate of cancer (per 100,000) for both sexes was calculated. We had also calculated the age standardized rate (ASR) for both sexes. Crude incidence rate of cancer in males and females by age groups was also performed. Statistical analysis was performed using SPSS (version 23.0) and Microsoft Excel 2010.

Results

Summary of total cancer cases over 10 years (from 2003 to 2012) were presented in Table 1. Crude cancer incidence rate was increased by year for both sexes (Table 2). Female crude cancer incidence rate was higher than male crude cancer incidence from 2003 to 2012. Female had also the higher ASR than the ASR of male from

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2003 to 2012. Cancer incidence rates for males increased from 12.75 per 100,000 in 2003 to 25.27 per 100,000 in 2012. Similarly, cancer incidence rates for females also increased from 15.09 per 100,000 in 2003 to 28.06 per 100,000 in 2012 (Figure 1). After 2011, incidence rates for males showed decreasing trends. Our finding performed up-and-down trends of cancer incidence in females from 2007 to 2012. The age standardized cancer rates among male increased from 17.33 per 100,000 in 2003 to 30.16 per 100,000 in 2012. The age standardized cancer rates among female increased from 20.47 per 100,000 in 2003 to 33.97 per 100,000 in 2012. Early age had low cancer incidence rate in both sex (Figure 1) however, in middle age, female cancer incidence was higher than male cancer incidence and again in old age, male cancer incidence was higher than female cancer incidence. Lung was the major common cancer over the ten years in males and stomach was the second common cancer though it was the third common cancer in 2003 (Figure 4). The top three major cancers in females were not changed throughout the 10 years (Figure 5).

Table 1. Summary of Total Cancer Cases from 2003 to 2012 in Nepal

| Years | Male  | Female | Total |
|-------|-------|--------|-------|
| 2003  | 1488  | 1763   | 3251  |
| 2004  | 2009  | 2156   | 4165  |
| 2005  | 2051  | 2331   | 4382  |
| 2006  | 2308  | 2570   | 4878  |
| 2007  | 2758  | 3276   | 6034  |
| 2008  | 2702  | 3247   | 5949  |
| 2009  | 2970  | 3229   | 6199  |
| 2010  | 3192  | 3581   | 6773  |
| 2011  | 3295  | 3793   | 7088  |
| 2012  | 3291  | 3921   | 7212  |
| Total | 26064 | 29867  | 55931 |

Table 2. Trend of cancer Incidence per 100,000 People in Nepal from 2003 to 2012

| Year | Total male crude incidence | Total female crude incidence | Both sex total crude incidence | Total male ASR | Total female ASR | Both sexes total ASR |
|------|---------------------------|-------------------------------|--------------------------------|----------------|------------------|---------------------|
| 2003 | 12.75                     | 15.09                         | 13.92                          | 17.33          | 20.47            | 18.89               |
| 2004 | 17.03                     | 18.26                         | 17.65                          | 23.28          | 24.89            | 24.07               |
| 2005 | 17.09                     | 19.4                           | 18.24                          | 23.3           | 26.35            | 24.81               |
| 2006 | 18.96                     | 21.1                           | 20.03                          | 25.88          | 28.54            | 27.2                |
| 2007 | 20.82                     | 24.58                         | 22.7                           | 28.2           | 33.26            | 30.72               |
| 2008 | 21.59                     | 25.93                         | 23.76                          | 29.42          | 35.42            | 32.38               |
| 2009 | 23.4                       | 25.44                         | 24.42                          | 32.03          | 34.58            | 33.29               |
| 2010 | 24.8                       | 27.82                         | 26.31                          | 34.1           | 37.89            | 35.99               |
| 2011 | 26.65                      | 27.51                         | 26.61                          | 30.62          | 33.22            | 32.01               |
| 2012 | 25.27                      | 28.06                         | 26.71                          | 30.16          | 33.97            | 32.16               |
Discussion

Our study reported the comprehensive incidence of cancer in males and females over 10 years in Nepal. Overall, the cancer incidence in male and female had increasing trend however, in male; there was decreasing trend after 2011. This study also revealed that up-and-down trend occurred in females from 2007 to 2012. This retrospective study indicated that the incidence in female cancer was higher than the incidence in male cancer.

The cancer treatment history of Nepal was very short (Subedi et al., 2012). The incidence of cancer was increased in Nepal every year (Pradhananga et al., 2009; Subedi et al., 2012). It could be because of increasing activities of screening programme in different parts of the country (NNCTR report) and the support from the International Agency for Research on Cancer (IARC) for early detection and prevention of cervix and breast cancer (Sankaranarayanan R et al., 2011). In last few years, cancer treatment facilities were only delivered by seven major hospitals of Nepal (Pradhananga et al., 2009; Bhatt et al., 2009), but now the number of private cancer hospitals has also increased which facilitated to diagnosis the cancer. It could be the another reason of increasing the number of new cancer cases every year in Nepal.

It was also reported that age was a major determinant of cancer incidence. The incidence of cancer increased dramatically with age (WHO fact sheet, 2015). Our study found that early age of male and female had low incidence rate of cancer. Finding from the study by Mishra et al. (2015), also performed that the incidence of cancer was found to be less in children below 15 years of age at 1.9%. Our study presented that the cancer incidence in females was higher in middle aged group than the middle aged males group however old aged groups of males had higher cancer incidence than the old aged females groups. The research conducted in Multi-Institution Hospital, Nepal presented that cancer cases increased by age. The number of cancer cases was highest for the age of 60-64 for male, while for female the number was highest for the age of 45-49 (Pradhananga et al., 2009). Likewise, another study demonstrated that the most prevalent age group in female was 50-54 years (12.8%), while in male it was 60-64 years (13.6%) (Pun et al., 2015).

Our study illustrated that bronchus and lung was the most common cancer in males over 10 years from 2003 to 2012. The crude incidence rate of bronchus and lung was increased from (2.25) in 2003 to (4.45) in male in 2012. Different studies had reported that lung cancer was the major in males (Pun et al., 2015; Pradhananga et al., 2009; Binu et al., 2007) in Nepal. It was because of lower education, unmarried individuals and Rai/Limbu/Magar ethnicity (Hashibe et al., 2010), household air pollution and tobacco consumption (Raspanti et al., 2016, Raspanti et al., 2015), and not enough medical health education (Khatiwada et al., 2012). For young people in western Nepal; smoking was a serious issue (Binu et al., 2010) which was the risk factor of lung cancer (Torre et al., 2015). However, a hospital based retrospective study in Manipal Teaching Hospital indicated that head and neck cancer were the most common types of cancer and lung was the second most common cancer in males (Bhat et al., 2009). In 2012, approximately 1.8 million new lung cancer cases were found, accounting for almost 13% of all cancers diagnosed. The highest lung cancer incidence rates among men were found in Europe, Eastern Asia, and Northern America, and the lowest rates were in Sub-Saharan Africa (Torre et al., 2015).

Our study illustrated that lung was the third common cancer in females both in years 2003 to 2012. The crude incidence rate of bronchus and lung was (1.52) in 2003 while it was (2.85) in 2012. Findings from the study by Pun et al. (2015) and Pradhananga et al (2009) had also reported that lung cancer was the third most common cancer for females in Nepal. In case of women, the highest –lung cancer occurred in Northern and Western Europe, Northern America, Eastern Asia, and Australia/New Zealand (Torre et al., 2015).

Our study found that the first three common cancers were not changed in females throughout the 10 years. This study illustrated that cervix uteri cancer was the most common type in females to all years from 2003 to 2012. The crude incidence rate of bronchus and lung was (1.52) in 2003 while it was (2.85) in 2012. Findings from the study by Pun et al. (2015) and Pradhananga et al (2009) had also reported that lung cancer was the third most common cancer for females in Nepal. In case of women, the highest –lung cancer occurred in Northern and Western Europe, Northern America, Eastern Asia, and Australia/New Zealand (Torre et al., 2015).

Our study found that the first three common cancers were not changed in females throughout the 10 years. This study illustrated that cervix uteri cancer was the most common type in females to all years from 2003 to 2012. The crude incidence rate of cervix uteri was (3.78) in 2003 while it was (5.35) in 2012. Studies had also revealed that cervix uteri was the most common cancer for females
of B P Koirala Memorial Cancer Hospital (7.3%) were
was (1.84) in 2012. Out of 7212 cases from the data
2003 in males, however, it was the second most common
al., 2008). The breast cancer incidence rates were higher
prevention and control of breast cancer in Nepal, breast
factors, and breast screening (Shrestha, 2012). For the
Kathmandu demonstrated that breast cancer was increased
the second most common cancer in females in 2012 (5.2%) were the larynx cases (Pun et al., 2015).
Similarly, another study reported that 3.7% larynx cancer in males while the corresponding percentage in females was 1.3% out of 4397 cases (Pradhananga et al., 2009).
In conclusion, to manage the burden of major
cancers such as lung cancer and larynx cancer in males in Nepal, health education and anti-smoking activities were essential. Our result also proved that the first three common cancers in females throughout the ten years were not changed. Studies had reported that cervix cancer and breast cancer could be prevented by the awareness of human papillomavirus (HPV), cervical cancer, HPV vaccine and screening programme. Thus, to prevent the various type of cancer, it is to be much emphasized that the knowledge and facts about the risk factors should be widely informed to the general mass of Nepal.

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