Retrospective sequential trend analysis of neoplasms reported in a tertiary care hospital of district Etawah, Uttar Pradesh

Sushil K. Shukla, Divyta Sachan, Prashant K. Bajpai, Dhiraj K. Srivastava, Manoj K. Verma, Tanya Agarwal

Department of Community Medicine, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India

ABSTRACT

Introduction: An estimated 2.25 million new cancer cases with 7 lakh cancer deaths were reported, according to GLOBOCAN 2018 in India. There is a steady rise in cancer cases, but trends and patterns vary within the state depending on the geographic region. **Objectives:** To study the proportion and site-wise distribution of neoplasm reported at a tertiary care hospital in district Etawah, Uttar Pradesh, India. **Material and Methods:** A record based retrospective study was conducted at a tertiary care hospital in district Etawah, Uttar Pradesh. Total four years (from 2015 to 2018) hospital-based retrospective data were collected from the Medical Record Department. Identification and distribution of malignant neoplasm were done according to the WHO ICD-10 classification. **Results:** Total cases diagnosed with malignancy from January 2015 to December 2018 were 3614. Cancer cases reported over the years was 932 (25.8%) in 2015, 1031 (28.5%) cases in 2016, 897 (24.8%) in 2017 and 754 (20.9%) in 2018. It was found that breast carcinoma (24.0%) accounted for the maximum number of cases diagnosed, followed by lung carcinoma (10.9%), cervical cancer (8.7%), gall bladder carcinoma (8%), and oral cavity cancer (7.9%). **Conclusion:** The present study reveals that the malignancy of the breast is most common, followed by malignancies of lung, cervix, and gall bladder among the patients who were seeking care in a tertiary care hospital of the district Etawah Uttar Pradesh, India.

Keywords: Cancer, carcinoma, ICD-10 classification, malignancy, neoplasm, tumor

Introduction

In 2018, cancer was the second dominant cause of deaths globally, with approximately 70% of deaths occurring in low and middle-income countries.[1] Cancers of lung, breast, and colorectum were responsible for one-third of the cancer incidence and mortality all around the world.[2] As the cancer cases are increasing in number, trends of cancers are varying according to the local situation, state, and countries. India has become the

Address for correspondence: Dr. Manoj K. Verma, Department of Community Medicine, Uttar Pradesh University of Medical Sciences, Saifai, Etawah - 206 130, Uttar Pradesh, India. E-mail: dr.manucommed18@hotmail.com

Access this article online

Quick Response Code:

Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_1468_20

2nd leading cause of death in the developing countries, accounting for 21 percent of mortality and ranks 3rd in developing countries, accounting for 9.5% of mortality.[3] It is estimated that at any given point of time, approximately 2 to 2.5 million cases of cancer are reported, out of which nearly half of them die each year and this burden will be doubled by the year 2026 according to the Indian Council of Medical Research.[3,4] The maximum number of cases reported in India is from Uttar Pradesh, Maharashtra, and Bihar, but the percentage of cancer in population is highest in Assam and Arunachal Pradesh.[5] Cancer is becoming a serious health problem as the population is shifting towards urbanization and industrialization in developing countries. This burden will keep on increasing unless we make necessary changes in our

How to cite this article: Shukla SK, Sachan D, Bajpai PK, Srivastava DK, Verma MK, Agarwal T. Retrospective sequential trend analysis of neoplasms reported in a tertiary care hospital of district Etawah, Uttar Pradesh. J Family Med Prim Care 2021;10:1419-24.

lifestyle pattern and reduce the risk of modifiable factors. On a brighter side, due to advances in research and education, the overall 5-year survival rate of cancer patients has increased.[6] This progress has to be maintained by early detection and treatment of cancer cases by the ongoing research advances.

In India, with over 1.2 billion population, cancer data are collected mainly from 29 hospital-based registries and 31 population-based registries, covering over 7% of the population.[7,8] Being a tertiary referral center, Uttar Pradesh University of Medical Sciences practically drains the whole of Etawah district. As the present study provides a trend analysis of neoplasms, it will be easy for primary care physicians to focus in particular to diagnosis and treatment of highly prevalent malignancies. This study will also provide statistical support and serve as a reference source to the epidemiologists, researchers, clinicians, and health policymakers.

Material and Methods

A hospital-based retrospective study was performed in a tertiary care hospital in district Etawah. The data were collected based on Four-year medical records between 1st January 2015 to 31st December 2018 from the Medical Records Department of the Uttar Pradesh University of Medical Sciences, Saifai, Etawah. In the generated list, all the diseases were classified according to the International Classification of Disease (ICD-10) given by WHO. From the list, we included all the cases categorized from C00 to C97, which belong to the category of a malignant neoplasm. Demographic details, including name, age, gender, and site of cancer was obtained from the list. The data so collected were entered into Microsoft Excel, and descriptive statistical analysis was done using SPSS version 24, IBM Corp., Chicago,
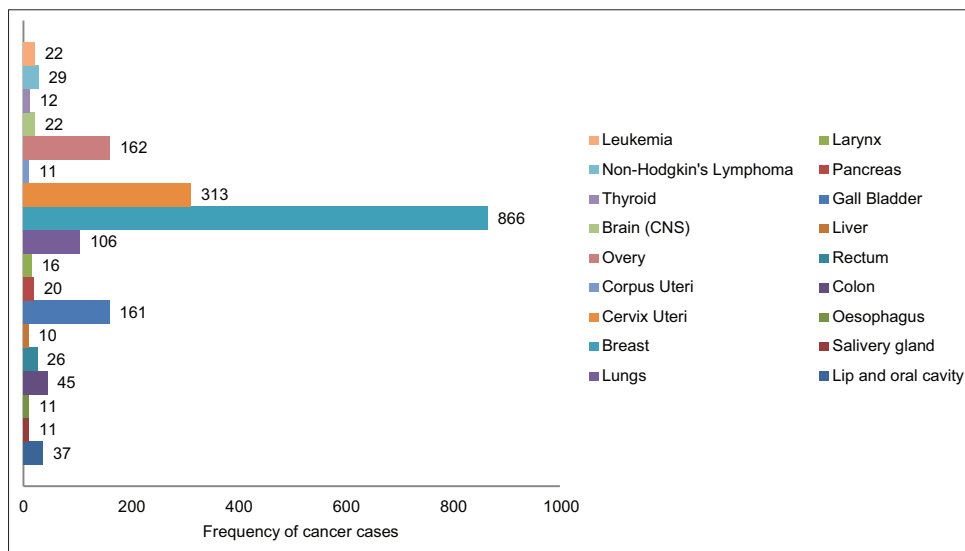

Figure 1: Distribution of females according to ICD-10 classification from 2015 to 2018 (N = 2036)
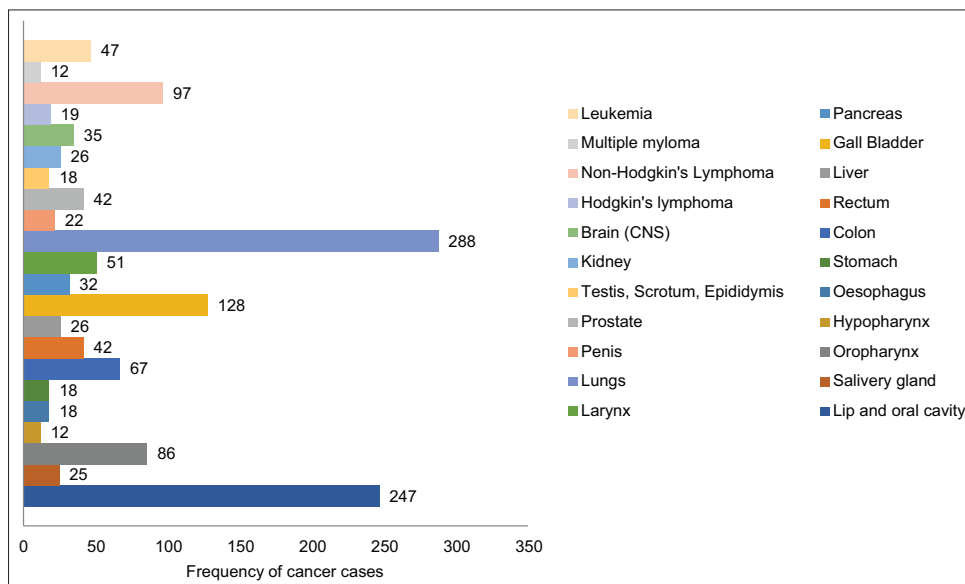

Figure 2: Distribution of males according to ICD-10 classification from 2015 to 2018 (N = 1578)

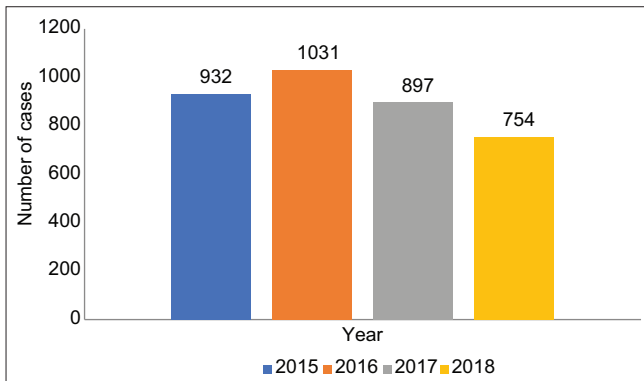| Table 1: Age-wise distribution of cancer with the maximum frequency of cases (top five)					
Age Groups (*n*=3614)					
0-14 years *n*=85 (2.3%)		15-64 years *n*=2996 (82.9%)		65 years and above *n*=534 (14.8%)	
Organ/Site	*n* (%)	Organ/Site	*n* (%)	Organ/Site	*n* (%)
Colon	16 (19%)	Breast	818 (27.3%)	Lungs	141 (26.4%)
Rectum	8 (9.5%)	Cervix	302 (10.1%)	Gall bladder	1209 (5.0%)
Leukemia	8 (9.5%)	Lungs	251 (8.4%)	Breasts	45 (8.4%)
Lip/oral cavity	8 (9.5%)	Lip/oral cavity	245 (8.2%)	Lip/oral cavity	31 (5.8%)
Brain/CNS	7 (8.3%)	Gall bladder	209 (7.0%)	Prostate	24 (4.5%)

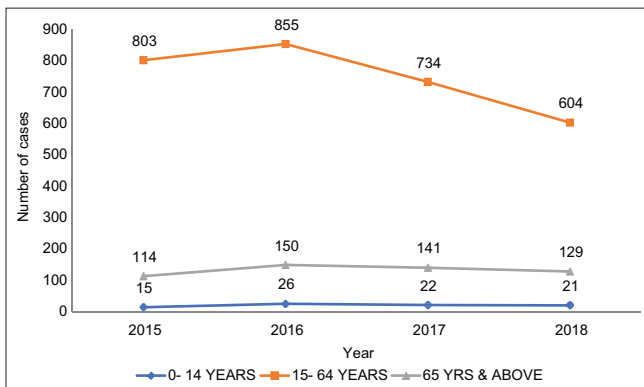**Figure 3:** Year-wise distribution of cancer cases from 2015 to 2018

Figure 4: Age wise trend of cancer cases among different age groups
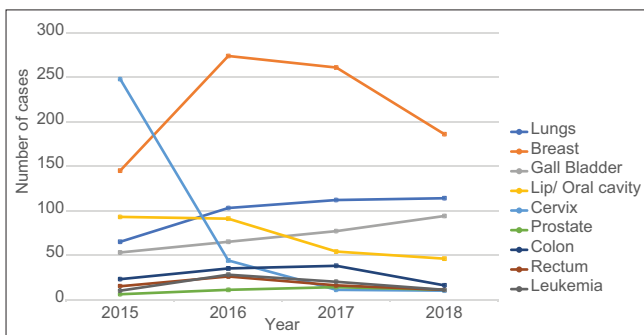

Figure 5: Year wise trend of malignancies from 2015 to 2018

USA. **Ethical Considerations:** Prior permission to use the data from the Medical Records Department was sought. The ethical clearance for the present study was taken from the University. Ethical approval was obtained on 30 October,2019.

Results

A total of 3614 cancer cases were reported during the year 2015 to 2018. The distribution of cancer cases reported over the years was 932 (25.8%) in 2015, 1031 (28.5%) cases in 2016, 897 (24.8%) in 2017 and 754 (20.9%) in 2018. Among the 3614 reported cancer cases, 2036 (56.3%) were female, and 1578 (43.7%) were male [Figures 1-4]. The female to male ratio for reported cancer cases was 1.2:1. There were 84 (2.3%) cases in the childhood age-group (0-14 years), 2996 (82.9%) cases in the adult age group (15-65), and 534 (14.8%) cases in the geriatric age group (>65 years) [Table 1]. Among males (n = 1578), maximum cases were of lung carcinoma (18.3%) followed by oral cancer (15.7%), gall bladder carcinoma (8.1%), Non-Hodgkin lymphoma (6.1%) and colon carcinoma (4.2%) while in females (n = 2036), the most common cancer diagnosed was breast cancer (42.5%), cervical cancer (15.4%), ovarian carcinoma (8%), gall bladder carcinoma (7.9%) and lung cancer (5.2%).

On studying the distribution of cancer cases, it was revealed that breast carcinoma (24.0%) accounted for the maximum number of cases diagnosed, followed by lung carcinoma (10.9%), cervical cancer (8.7%), gall bladder carcinoma (8%), and oral cavity cancer (7.9%) [Table 2].

Breast cancer

The carcinoma of breast constituted the largest number of cases diagnosed in the hospital. During the period of three years, 866 cases of breast carcinoma were diagnosed. About 94% of the cases present in adult females of age group (15–65 years) while the maximum number of cases 487 (56.2%) were diagnosed between the age of 41 and 60 years.

Lung cancer

Lungs were the second most common organ affected by carcinoma in the overall group (10.9%) of all the diagnosed cases. In males, lung carcinoma was most common (18.3%), while in females (5.2%) it was the 5th most common site among cancer cases. Lung carcinoma is most common in the geriatric age group and around 50% were diagnosed in the age group between 61 and 80 years.

Gynecological carcinoma

Cervical carcinoma was the 2nd most common cancer of females, constituting 15.4% of all cancers diagnosed in females,

Table 2: Distribution of cancer patients as the ICD 10 classification on ICD 10 classification			
Organ based on ICD-10 classification	Frequency (%)		
	Male	Female	Total
Salivary Glands	25 (1.6)	11 (0.5)	36 (1.0)
Oropharynx	86 (5.4)	5 (0.2)	91 (2.5)
Nasopharynx	2 (0.1)	1 (0.0)	3 (0.1)
Lip, Oral Cavity	247 (15.7)	37 (1.8)	284 (7.9)
Hypopharynx	12 (0.8)	1 (0.0)	13 (0.4)
Esophagus	18 (1.1)	11 (0.5)	29 (0.8)
Stomach	18 (1.1)	4 (0.2)	22 (0.6)
Colon	67 (4.2)	45 (2.2)	112 (3.1)
Rectum	42 (2.7)	26 (1.3)	68 (1.9)
Anus	5 (0.3)	5 (0.2)	10 (0.3)
Liver	26 (1.6)	10 (0.5)	36 (1.0)
Gall Bladder	128 (8.1)	161 (7.9)	289 (8.0)
Pancreas	32 (2.0)	20 (1.0)	52 (1.4)
Larynx	51 (3.2)	16 (0.8)	67 (1.9)
Lung	288 (18.3)	106 (5.2)	394 (10.9)
Melanoma Of The Skin	3 (0.1)	1 (0.0)	4 (0.1)
NMSC	5 (0.3)	3 (0.1)	8 (0.2)
Mesothelioma	1 (0.1)	1 (0.0)	2 (0.1)
Kaposi Sarcoma	2 (0.1)	1 (0.0)	3 (0.1)
Female Breast	0 (0.0)	866 (42.5)	866 (24.0)
Vulva	0 (0.0)	5 (0.2)	5 (0.1)
Vagina	0 (0.0)	2 (0.1)	2 (0.1)
Cervix Uteri	0 (0.0)	313 (15.4)	313 (8.7)
Corpus Uteri	0 (0.0)	11 (0.5)	11 (0.3)
Ovary	0 (0.0)	162 (8.0)	162 (4.5)
Penis	22 (1.4)	0 (0.0)	22 (0.6)
Prostate	42 (2.7)	0 (0.0)	42 (1.2)
Testis Scrotum Epididymis	18 (1.1)	0 (0.0)	18 (0.5)
Kidney	26 (1.6)	7 (0.3)	33 (0.9)
Bladder And Ureter	54 (3.4)	9 (0.4)	63 (1.7)
Brain/Central Nervous System	35 (2.5)	22 (1.1)	57 (1.6)
Thyroid	4 (0.3)	12 (0.6)	16 (0.4)
Hodgkin Lymphoma	19 (1.2)	2 (0.1)	21 (0.6)
Non-Hodgkin Lymphoma	97 (6.1)	29 (1.4)	126 (3.5)
Multiple Myeloma	12 (0.8)	3 (0.1)	15 (0.4)
Leukemia	47 (3.0)	22 (1.1)	69 (1.9)
Others	144 (9.1)	106 (5.2)	250 (6.9)
Total	2036	1578	3614

followed by ovarian carcinoma, which formed 8% of the total cancer cases among females. Cervical carcinoma was most commonly diagnosed among women in the age group of 41–60 years (55.5%), and a similar distribution was observed for ovarian carcinoma (54.9%).

Gall bladder carcinoma

Cancer of the gall bladder formed 3rd most common malignancy, both in males and females. Cancer of the gall bladder was more common in women with a male: female ratio of 1: 1.2. About 48% of the total gall bladder cancers were diagnosed in the age group of 41–60 years, followed by 39% cases in 61–80 years, while none of the cases were reported in the age group from 0 to 20 years.

Oral cavity cancer

Malignancy of the oral cavity was most common among head and neck cancers, forming a total of 7.9% of the total cancer cases. Oral carcinoma was the 2nd most common cancer diagnosed among males contributing to 15.7% of the total cancer cases in males. It was found to be most common (86.2%) in the adult population with the age of 15–65 years, while the maximum numbers of cases were reported 45.7% between the age group of 41 and 60 years. Oral carcinoma was most commonly found among males with a male to female ratio of 6.6:1.

Others

These tumors comprised 6.9% of the total cancer cases and ranked 6th in the overall study group.

Discussion

The present study spans over four years (2015–2018) including the sample analysis for 3614 confirmed cancer cases. If we observe the patterns of cancers in the institutions over the years, it may reflect the predominant cancers of a region that can indicate the burden of cancer. Data from the United States showed a decreased trend of decline in female breast carcinoma and carcinoma of the colorectal area. But the lowering trend of lung carcinoma has been increased.[9]

In the present study, the prevalence of cancer was found to be higher among the females with male to female ratio of 1:1.2 while comparing with Mumbai, where it was 1: 0.7, 1: 0.7 in Guwahati, 1: 1.09 in Chennai, 1: 0.8 in Delhi, 1: 0.78 in Chandigarh, 1: 0.7 in Rajasthan and 1: 1.5 in Punjab.[10,11] In the current study, cancer of the lung was the leading site of cancer (18.3%) among men. It was also the leading site among males in Chandigarh (11.9%), Bengaluru (10.8%), Chennai (10.0%), Thiruvananthapuram (15.3%). While in females, the most common site for cancer in the present study was found to be breast (42.5%), which was similar to Chandigarh (18.6%), New Delhi (26.1%), Mumbai (27.6%), Chennai (24.3%), Guwahati (16.1%) which is also similar worldwide as suggested by GLOBOCAN 2012.[10,12] Distribution of cancer in studies conducted by T Cherian *et al.* and R G Sharma *et al.* revealed that breast carcinoma was the leading cause of cancer in followed by lung, which was similar to the present study.[13,14] The prevalence of cancer for both the sites i.e., lung and breasts, was found to be higher in the present study when compared with the rest of the institutions. A study conducted by RA Badwe *et al.,* showed an increased incidence of lung and breast cancer over the years from 1988 to 2005.[15] A similar pattern was observed in the present study in case of lung cancer; however, the incidence of breast carcinoma was found to be decreased. This could be due to the increased awareness among women regarding breast cancer which leads to early diagnosis and treatment. Incidence of lip and oral cavity cancer decreased from 32.7% (2015) to 16.2% (2018) in the present study, which was found to be in contrast with the study

conducted by [Figure 5] M. Du *et al.,* which reported an increase of 109% over a period of 28 years (1990–2017) globally.[16] The incidence of cervical cancer has shown a considerable decrease in the present study, which in in accordance with the studies conducted by P K Dhillon *et al.*, Levi *et al.* and Walker *et al.*[17-19] The maximum numbers of cancer cases were found to be in the adult age group (82.9%) in our present study, which was similar to Mumbai (76.6%), Bengaluru (68.9), New Delhi (72%), Guwahati (68.7) and Chandigarh (66.5).[10] A study conducted by Shabani M *et al.* in Iran showed that there was 13% increase in the overall cancers among children of less than 15 years in year 2016 when compared with the data of year 1990.[20] According to the study conducted by RS Arora *et al.*, most common childhood cancer in India were Leukemia, CNS tumors, lymphomas, bone tumors, and renal carcinomas.[21] However, in the present study, though leukemia and CNS tumors were amongst the five most common cancers in the age group of 0–14 years, cancer of the colon was the most commonly detected tumors of childhood.

Limitation

There are several limitations in describing the pattern of cancer in any health facility. The prevalence of cancer and their leading sites, as presented by any health institution, may depend on diverse factors like availability of the facility of diagnosis and treatment, the credibility of the handling physician, and affordability of the patients. Due to these factors, the health facility might deal with a variable number of cancer cases along with the fluctuation in leading sites of cancer every year.

Conclusion

It has been observed over the year that the number of cancer cases is increasing in India. In India, due to economic conditions, limited availability, and accessibility of health facilities, lack of awareness and education, we are lacking in early detection of malignancies. The present study also disclosed that the malignancy of the breast is most common, followed by malignancies of lung, cervix, and gall bladder among the patients who were seeking care in a tertiary care hospital of the district Etawah.

Recommendations

Further study needs to be done to evaluate the risk factors of malignancies prevailing in the catchment area of a tertiary care hospital of district Etawah along with imparting health education in the community for early diagnosis and treatment of various malignancies.

Key-Message

The trend analysis showed a rise in cases of malignancies such as breast, lung, and cervix in rural tertiary care hospital. In countries such as India, the economic conditions are not already good, and the COVID-19 has given a down thrust to the already overburdened health care system. There is a need to identify the cancers at early stages, predominantly focusing on those with increasing trend. So, that appropriate preventive measures and early treatment could be provided at the primary care level.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Cancer. Available from: https://www.who.int/news-room/fact-sheets/detail/cancer.

2. International Agency for Cancer Research, 2018. Available from: https://www.who.int/cancer/PRGlobocanFinal.pdf.

3. Puri S, Ashat M, Pandey A, Goel NK, Singh A, Kaushal V. Socio-demographic characteristics of cancer patients: Hospital based cancer registry in a tertiary care hospital of India. Indian J Cancer 2014;51:1-4.

4. Park K. Epidemiology of chronic non-communicable disease and conditions. In: Park's Text book of Preventive and Social Medicine. 21st ed.. Jabalpur, MP, Inida: M/S Banarsi Das Bhanot Publishers; 2011. p. 353-61.

5. Sharma NC. India recorded about 3.9 million cancer cases in 2016. Live mint. 2017. Available from: https://www.livemint.com/Politics/3eXX60XBig4bWZ25Kr1iQO/India-recorded-about-39-million-cancer-cases-in-2016-data.html.

6. American Cancer Society. Cancer Facts & Figure 2020. Available from: https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2020/cancer-facts-and-figures-2020.pdf.

7. Behera P, Patro BK. Population based cancer registry of India–the challenges and opportunities. Asian Pac J Cancer Prev 2018;19:2885-9.

8. Kumar AV, Yeole BB. Assessing cancer burden in rural India: An analysis by cause of death statistics. Asian Pac J Cancer Prev 2005;6:221-31.

9. Siegel R, Miller K, Jemal A. Cancer statistics, 2020. CA Cancer J Clin 2020;70:7-30.

10. Consolidated Report of Hospital Based Cancer Registries: 2012-2014. National Centre for Disease Informatics & Research. National Cancer Registry Programme. Indian Council of Medical Research. Available from: http://ncdirindia.org/NCRP/ALL_NCRP_REPORTS/HBCR_REPORT_2012_2014/index.htm.

11. Aggarwal R, Manuja KA, Singh GP. Pattern of cancer in a tertiary care hospital in Malwa region of Punjab, in comparison to other regions in India. J Clin Diagn Res 2015;9:XC05.

12. GlOBOCAN 2012: Word Cancer Facts – International Agency for Research on Cancer – WHO; 2012. Available from: http://www. globocan.iarc.fr/Pages/fact_sheets_cancer.aspx. [Last accessed on 2020 May 30].

13. Sharma RG, Kapoor R, Bang BA, Gurjar K. Spectrum of malignancies in Jaipur region (2004-2008). Indian J Cancer 2014;51:45-53.

14. Cherian T, Mahadevan P, Chandramathi S, Govindan J, Mathew IL. Increasing cancer incidence in a tertiary care hospital in a developing country, India. Indian J Cancer 2015;52:133-8.

15. Badwe RA, Dikshit R, Laversanne M, Bray F. Cancer incidence trends in India. Japanese J Clin Oncol 2014;44:401-7.

16. Du M, Nair R, Jamieson L, Liu Z, Bi P. Incidence trends of

lip, oral cavity, and pharyngeal cancers: Global burden of disease 1990–2017. J Dent Res 2020;99:143-51.

17. Dhillon PK, Yeole BB, Dikshit R, Kurkure AP, Bray F. Trends in breast, ovarian and cervical cancer incidence in Mumbai, India over a 30-year period, 1976–2005: An age–period–cohort analysis. Br J Cancer 2011;105:723-30.

18. Levi F, La Vecchia C, Randimbison L, Te VC. Incidence, mortality and survival from invasive cervical cancer in Vaud, Switzerland, 1974-1991. Ann Oncol 1994;5:747-52.

19. Brewster D, Gould A, Raab GM. Trends in incidence of and mortality from invasive cancer of the uterine cervix in Scotland (1975–1994). Public Health 1998;112:373-8.

20. Shabani M, Saeedi Moghaddam S, Ataeinia B, Rezaei N, Mohebi F, Mohajer B, *et al.* Trends of National and subnational incidence of childhood cancer groups in Iran: 1990–2016. Front Oncol 2020;9:1428. doi: 10.3389/fonc. 2019.01428.

21. Arora RS, Eden TO, Kapoor G. Epidemiology of childhood cancer in India. Indian J Cancer 2009;46:264-73.