Original Article

Epidemiology of cancers in Jammu: An analysis of hospital data.

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Abstract:

Background:

Cancer is the leading cause of death and an important barrier to increasing life expectancy in almost every country of the world. Cancer profile differs in different parts of the world, and an epidemiological study will help us in knowing the common cancer types prevalent in particular segments of a population, and the risk factors involved. The present study aims to analyze the incidence and patterns of different cancers in Jammu division.

Materials and Methods:

The present study was conducted between January 1, 2020 and December 31, 2020 at our Regional Cancer Center (RCC), Jammu. All the relevant information was obtained from well-maintained files of patients from the Hospital Based Cancer Registry. Only those cases which were histologically confirmed were included in the study.

Results:

Total cancer patients registered in the cancer registry were 1712 out of which 997 (58.2%) were males and 745 (42.5%) were females with a male to female ratio of 1.33:1. Most of the patients were in the age group of 60-80 years for males and 40-60 years for females. Carcinoma Lung was the most common cancer reported in 239 (13.96%) patients followed by cancers of Head and Neck (9.11%), Breast (8.29%), Oral Cavity, Esophagus. Carcinoma Breast and Lung were the most common cancers in the age group 40-60 and 60-80 years. In the older age group (>80 years) also Carcinoma Lung was predominant.

Conclusion:

The present study attempted to observe predominant cancer types in Jammu division, which may be helpful in their management and developing a cancer prevention program for prevalent types in this region. Geriatric oncology is an emerging speciality and an action plan has to be prepared by oncology department to treat such patients.

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Introduction

Cancer is a major cause of morbidity and mortality in developing and developed countries. Cancer is the leading cause of death and an important barrier to increasing life expectancy in almost every country of the world[1]. According to estimates from the World Health Organization (WHO) in 2019,[2] cancer is the first or second leading cause of death before the age of 70 years in 112 of 183 countries and ranks third or fourth in a further 23 countries. Cancer's rising incidence as a leading cause of death reflects marked declines in mortality rates of stroke and coronary heart disease, relative to cancer, in many countries[1].

The GLOBOCAN 2020 estimates indicate that there were 19.3 million new cases of cancer and almost 10 million deaths from cancer in 2020. Worldwide, an estimated 28.4 million new cancer cases (including NMSC, except basal cell carcinoma) are expected to occur in 2040, a 47% increase from the corresponding 19.3 million cases in 2020, assuming that national rates estimated in 2020 remain constant. The relative magnitude of increase is most evident in low HDI countries (95%) and in medium HDI countries (64%). In terms of the absolute burden, the high HDI

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countries are expected to experience the greatest increase in incidence, with 4.1 million new cases more in 2040 compared with 2020. This increase is mainly due to the growth and aging of the population and may be further aided by an increasing prevalence of risk factors in many parts of the world[3].

A recent observation is the ongoing displacement of infection-related and poverty-related cancers (e.g., cervix, liver, stomach) with cancers that are uniformly common in the most developed countries (e.g., breast, lung, colorectum, prostate), and hence requiring changes in the priorities in national cancer control strategies[4].

In order to identify the burden of cancers in India, a Cancer Registry Programme was started by Indian Council of Medical Research in 1982 with an objective of determining the magnitude and pattern of various cancers. The programme started with six cancer registries, out of which three were population based cancer registries (PBCRs) and three were hospital based cancer registries (HBCRs). It has gradually expanded over the years and at present there are 24 population based cancer registries and 5 hospital based cancer registries working under the network of National Cancer Registry Programme. Lately in 2005-2006, Northeastern states were also covered in the registry programme[5]. In 2013, the Department of Community Medicine of Government Medical College, Jammu of Jammu and Kashmir state took up the lead in starting its own hospital based cancer registry with an objective of assessing the pattern and distribution of various cancers among the patients attending the hospital.

Cancer profile differs in different parts of the world, and an epidemiological study will help us in knowing the common cancer types prevalent in particular segments of a population, and the risk factors involved[6]. The projected incidence of patients with cancer in India among males was 679,421 (94.1 per 100,000) and among females 712,758 (103.6 per 100,000) for the year 2020. The projected 5 most common cancers in 2020 for males (lung, mouth, prostate, tongue, and stomach) constitute 36% of all cancers and for females (breast, cervix uteri, ovary, corpus uteri, and lung) constitute 53% of all cancers[7]. The Jammu and Kashmir is distinct from rest of India with respect to its geography, climate, dietary habits and social culture. However, the climate and dietary habits of Jammu division are somewhat similar to the northern states like Punjab, Delhi etc, so cancer patterns are also similar to theirs. As the Regional Cancer Centre (RCC) in Jammu is the only center maintaining the cancer registry in this area for the last few years, it is worth analysing the incidence of the different types of cancers in this part of the world, which is socially and culturally different from the rest of the world.

Materials And Methods

The present study was conducted between January 1, 2020 and December 31, 2020 at our institute, which is a cancer referral center for the entire Jammu division. GMC, Jammu is a comprehensive cancer care hospital and the only major tertiary care government hospital in Jammu division of J&K that caters not only to patients of Jammu division but also Kashmir, Ladakh and neighbouring states of Punjab and Himachal Pradesh. The Radiation services provided to the patients are totally free of cost making it the most frequently visited hospital by the cancer patients. In addition, many patients are directly referred to this hospital from the private sector. All the relevant information was obtained from well-maintained files of patients from the Hospital Based Cancer Registry, Jammu. Medical records of all these patients were analyzed. All patients were assigned a Regional Cancer Centre number. The history, results of physical examination and investigations were recorded for these patients and cancer staging was done accordingly. Only those cases which were histologically confirmed were included in the study. All such patients were enrolled for this study.

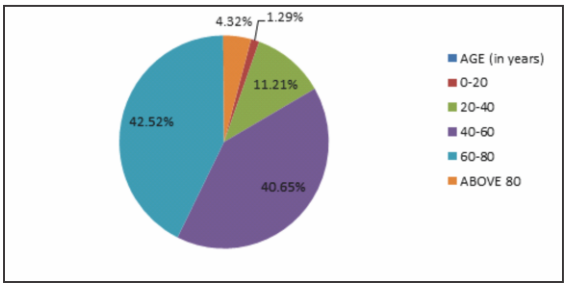
Results

Total cancer patients registered in the cancer registry were 1712 (1 January 2020 to 31 December 2020), out of which 997 (58.2%) were males and 745 (42.5%) were females with a male to female ratio of 1.33:1. Most of the patients were in the age group of 60-80 years for males and 40-60 years for females. Age-sex distribution of cancers are shown in Table 1. Distribution of cancers in different age groups are shown in Fig

Table 1: Age-sex distribution of cancers

AGE(in years)	MALE	FEMALE	TOTAL
0-20	15 (1.50%)	7(0.94%)	22(1.29%)
20-40	101(10.13%)	91(12.21%)	192(11.21%)
40-60	360(36.11%)	366(49.13%)	696(40.65%)
60-80	465(46.64%)	263(35.30%)	728(42.52%)
ABOVE 80	56(5.62%)	18(2.42%)	74(4.32%)
TOTAL	**997**	**745**	**1712**

Fig 1: Age distribution of cancers



Carcinoma Lung was the most common cancer reported in 239 (13.96%) patients followed by Carcinoma Head and Neck (9.11%), Carcinoma Breast (8.29%) and Carcinoma Oral Cavity (Table 2).

Table 2: Distribution of different cancers

SITE	NO. OF PATIENTS
LUNG	239 (13.96%)
HEAD AND NECK	156 (9.11%)
BREAST	142 (8.92%)
ORAL CAVITY	117 (6.83%)
ESOPHAGUS	111 (6.48%)
HEMATOLOGICAL MALIGNANCIES	110 (6.43%)
HEPATOBILARY	102 (5.96%)
GENITOURINARY	92 (5.37%)
CERVIX	73 (4.26%)
COLORECTAL	73 (4.26%)
OVARY	61 (3.56%)
STOMACH	56 (3.27%)
LYMPHNODE	55 (3.21%)
BRAIN	45 (2.63%)
BONE & SOFT TISSUE	39 (2.28%)
PROSTATE	32 (1.87%)
KIDNEY	26 (1.52%)
PANCREAS	26 (1.52%)
ENDOMETRIUM	20 (1.17%)
SKIN	13 (0.76%)
THYROID	8 (0.47%)
VULVA /VAGINA	8 (0.47%)
ANAL CANAL	6 (0.35%)
OTHERS	16 (0.93%)
UNKNOWN PRIMARY	86 (5.02%)
TOTAL	**1712**

In males, most common cancer sites includes Lung, Head and Neck, Oral cavity, Genitourinary and Esophagus. In females, Carcinoma Breast was the most commonly reported cancer and comprised of 18.38% cases of female cancers with maximum cases in age range of 40-60 years followed by Carcinoma cervix (Table 3)

Table 3: Top 5 cancers in Males and Females

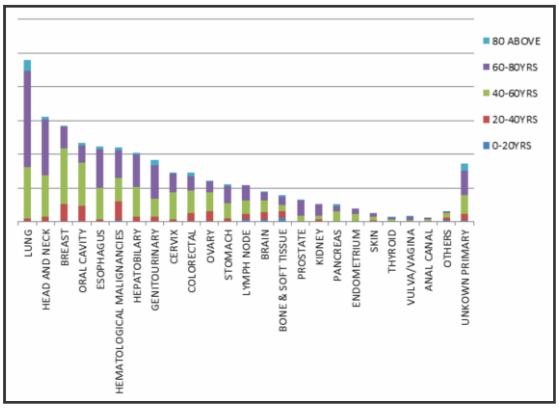
MALES (n=997)		FEMALES (n=745)	
Lung	179 (17.95%)	Breast	137 (18.38%)
Head & Neck	127 (12.73%)	Cervix	73 (9.79%)
Oral cavity	109 (10.93%)	Hepatobiliary	62 (8.32%)
Genitourinary	81 (8.12%)	Ovary	61 (8.18%)
Esophagus	71 (7.12%)	Lung	60 (8.05%)

Cancers of larynx, pharynx, nose, nasal cavity, paranasal sinuses and salivary glands have been grouped under head and neck cancers. Among head and neck cancers, laryngeal cancer is the most commonly reported cancer.

Genitourinary includes ureter, urinary bladder, urethra and genital organs. Cancers involving genitourinary tract constituted 5.37%, female genital tract 9.46%, bone and soft tissue 2.28%, hematological malignancies 6.43% and unknown primary 5.02% of all cancers.

Cancers of Bone and soft tissue were the most common cancer accounting for 27.27% of cancers in the age group 0-20 years. In the age group 20-40 years, hematological malignancies topped the list followed by Ca Breast and Ca Oral Cavity. Carcinoma Breast and Lung were the most common cancers in the age group 40-60 and 60-80 years. In the older age group (>80 years) also Carcinoma Lung was predominant. Distribution of different types of cancers with relation to age are represented in Fig 2

Fig 2: Age distribution of different cancers



The staging of cancers was also done. Majority of the patients who presented to the hospital were in Stage IV (28.50%) and Stage III (23.48%). Distribution of most common cancers along with their staging are given in Table 4

Table 4: Common cancers with their staging

SITE	PATIENTS	STAGE I	STAGE II	STAGE III	STAGE IV	888 (Not applicable)
LUNG	239	7	30	70	132	0
HEAD AND NECK	156	10	20	44	82	0
BREAST	142	6	66	45	23	2
ORAL CAVITY	117	2	25	13	67	10
ESOPHAGUS	111	2	24	54	31	0
HEMATOLOGICAL MALIGNANCIES	110	0	0	0	0	110
HEPATOBILARY	102	0	17	29	55	1
GENITOURINARY	92	8	23	45	16	0
CERVIX	73	1	15	33	24	0
COLORECTAL	73	4	11	33	23	2
OVARY	61	2	7	37	15	0

District wise distribution of different cancers are shown in Fig 3. Majority of the patients were from Jammu region (40.01%) followed by Kathua and Udhampur. Most commonly reported cancers in Jammu region were Carcinoma Lung, Breast and Head and Neck (Fig 4). Carcinoma Lung was the most common cancer reported in Jammu, Kathua, Samba, Udhampur, Reasi and Rajouri. However, Poonch reported maximum cases of Ca stomach and esophagus which is also the commonest cancer in Kashmir division. This could be due to same climatic conditions, dietary habits and social culture of the two adjoining areas.

Fig 3: District wise distribution of cancers

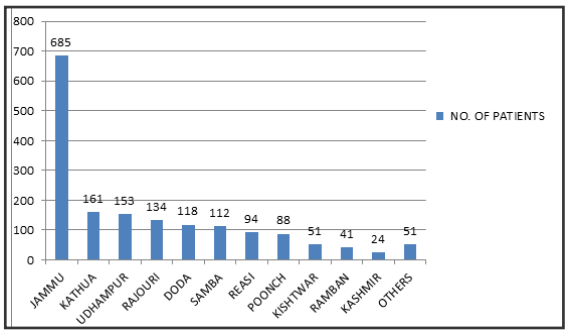
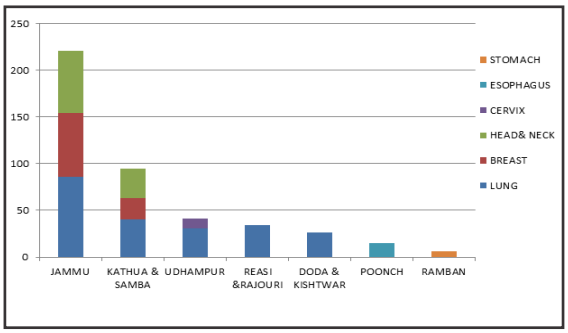


Fig 4: Common cancers in different districts of Jammu division



Discussion

The incidence and pattern of cancer differs from country to country. Developed countries have a high incidence of cancer because of their diet patterns, lifestyle and affluent living conditions. Increase in the life expectancy is one of the important factors for an increased incidence of cancer. Cancer is predominantly a disease of middle and old age, although no age is immune. 25% of cancers in the developing countries are associated with chronic infection[5]. A detailed data is required to inform medical care with highest level of evidence. Hence, cancer registries are considered to be important part of cancer management in any part of the world.

According to GLOBOCON 2020, there were an estimated 19.3 million new cases of cancer and 10 million cancer deaths worldwide in 2020.3 India exhibits heterogeneity in cancer. According to the national cancer registry India 2020, the highest incidence rate of cancer was observed in North eastern region than other areas in the country[7].

The present study reported 1712 cancer cases in the year 2020, out of which males accounted for 997 (58.23%) and females for 745 (43.51%) cases with male to female ratio of 1.33:1 which is in accordance with Qurieshi et al.[8] and Tyagi et al.[9] This was true for all the commonly encountered cancers in our population like lung cancer (2.98:1), head and neck cancer (4.37:1) and oral cavity (13.6:1). The projected incidence of patients with cancer is higher for females (712,758) than males (679,421) for the year 2020[7]. Most common age group for cancer in males was 60-80 years which is in accordance with Khair Ul Nisa et al.[10] In females it was 40-60 years which is in accordance with Qurieshi et al.[8].

Carcinoma Lung was the most common cancer in Jammu region accounting for 13.96% of all cancers and leading cancer type in the male population of the region which is in accordance with all the registries under South region[11]. Another study by Koul et al.[12] reported that Srinagar, the summer capital of Jammu and Kashmir, has the highest incidence of lung cancer among males in India. Lung cancer is the leading cause of cancer morbidity and mortality in men, whereas, in women, it ranks third for incidence, after breast and colorectal cancer, and second for mortality, after breast cancer[3]. In India, lung cancer can be attributed to tobacco use and air pollution, which are the major risk factors[13]. Approximately 70% of cancers in India were potentially preventable through modifiable risk factors[14]. A hospital-based study from northern India reported that 90% of patients with lung cancer were diagnosed at an

advanced stage of the disease, and there was a delay in diagnostic evaluation and treatment[15]. Creating cancer awareness, preventing risk factors, and improving access to care among people would lead to downstaging of cancer[7].

Head and neck cancer was the second most common cancer overall (9.11%) and among males (12.78%) with male to female ratio of 4.37:1. Among all head and neck cancers, laryngeal cancer was commonest contributing to 50% of all head and neck cancers. This is similar to the study by Qurieshi et al.[8]. This could be due to the fact that tobacco use in the form of smoking is common among men, which is a known risk factor for laryngeal cancer[16]. This is followed by oral cancer accounting for 6.83% of all cancers comparable to study by Basavarajappa et al.[17]. This could be due to habit of chewing tobacco so prevalent in India.

The relative proportion of cancers associated with the use of tobacco has been analysed according to the latest monograph of International Agency for Research on Cancer. IARC in 1987 reported that there is association between tobacco use and cancer of lip, tongue, mouth, pharynx, esophagus, larynx, lung, and urinary bladder. Later on, in 2004, a newer monograph stated that there is a sufficient evidence to establish a causal association between use of tobacco and cancers of nasal cavity, uterine cervix, esophagus (adenocarcinoma), stomach, liver, kidney, and myeloid leukaemia apart from the sites mentioned earlier in the previous monograph (IARC, 1987). The latest monograph (2004) has added ovary, colon, and rectum to its list[18].

Tobacco related cancers (TRCs) constitutes two-thirds of all cancers with three-fourths of cancers among men and more than half of cancers among women which is more in comparison with the data available from population based cancer registries in India, where they have shown that TRCs constitutes to nearly half of all cancers among males and only one-fifth of cancers among females[8].

Hematological malignancies (Multiple myeloma, lymphomas and leukemais) ranked fifth in the distribution in the study accounting for 6.43% which is comparable to the study by Rasool et al.[5].

Carcinoma Breast was the most common cancer in adult females in Jammu region accounting for 18.38% of all cancers in females which is in accordance with Basavarajappa et al.[17]. Similar incidence has been found in other cities of the country like Delhi and Mumbai. Breast cancer is common in affluent societies having western lifestyle[5]. The risk factor for occurrence of breast cancer was contributed by stress in the form of higher education and occupation, late menopause, history of induced abortion, first-degree family history of the disease and body mass index[19]. Female breast cancer has now surpassed lung cancer as the leading cause of global cancer incidence in 2020, with an estimated 2.3 million new cases, representing 11.7% of all cancer cases. It is the fifth leading cause of cancer mortality worldwide, with 685,000 deaths[3]. A comprehensive approach to breast cancer, including awareness programs, preventive measures, screening programs for early detection, and availability of treatment facilities, are important for reducing both incidence and mortality of cancer in Indian women[20].

In our study carcinoma cervix was the second most common cancer in females accounting for 9.79% cases in females. When we compare it with rest of India, cervical cancer is second only to breast cancer and at some places it ranks as the most common cancer among Indian females[21]. However, this is in contrast to the studies by Rasool et al.[5] and Qurieshi et al.[8] Ca Ovary was the fourth most common malignancy in females accounting for 8.18% of all the cases in females whereas it occupies second place in a study by Tyagi et al.[9].

Hematological malignancies (Multiple myeloma, lymphomas and leukaemias) were also reported in the study accounting for 6.43% which is comparable to the study by Rasool et al. [5].

Majority of the patients in our study presented in Stage IV (28.50%) followed by Stage III (23.48%), Stage II (13.20%) and Stage I (2.16%).

As per district wise distribution, majority of the patients were from Jammu district (40.01%) followed by Kathua (9.40%), Udhampur (8.94%), Rajouri (7.83%), Doda (6.89%), Samba (6.54%), Reasi (5.49%), Poonch (5.14%), Kishtwar (2.98%), Kashmir (1.40%) and others (2.97%). Most commonly reported cancers in Jammu region were Carcinoma Lung, Breast and Head and Neck. Carcinoma Lung was the most common cancer reported in Jammu, Kathua, Samba, Udhampur, Reasi and Rajouri. However, Poonch reported maximum cases of cancer stomach and esophagus which is also the commonest cancer in Kashmir division.

The present study represents the true caseload of cancer being handled in GMC& Hospitals.We have collected the data regarding newly diagnosed cases of cancer from all departments involved in the management of cancers over a defined period of time. However, it cannot be neglected that still a few patients might have been left out especially those who might have been evaluated on OPD basis and they might have been referred/shifted to some other

hospital for further treatment. Nonetheless this data in no manner portrays the true picture of cancer in Jammu division and it suffers from the same deficiencies as the previous studies as it is purely hospital based data.

Conclusion

The present study attempted to observe predominant cancer types in Jammu division, which may be helpful in their management and developing a cancer prevention program for prevalent types in this region. Smoking related tumors have a high incidence in the region such as Lung cancer. Moreover due to increasing smoking rates in children and adults, the incidence of such cancers may further rise in near future. Breast cancer was the most common cancer in females followed by cervical cancer. Early detection of cervical and breast cancer should be encouraged in women through health education, prompting early diagnosis. In addition, the elderly and geriatric age groups show high incidence of cancer and management of such group is totally different from the younger age group keeping in view the co-morbidities associated with them. Geriatric oncology is an emerging speciality and an action plan has to be prepared by oncology department to treat such patients.

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