Survey of Patients with Cancer in Jammu and Kashmir: Based on Hospital Registry Records

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Abstract

Purpose: Cancer is the leading cause of death among patients in Jammu and Kashmir (J&K). The objective of this study was to estimate the number of cancer patients receiving treatment at four prospective hospitals in J&K. The data were obtained from the hospital-based records from Government Medical College (GMC) Hospital Jammu, Acharya Shri Chander College of Medical Sciences and Hospital (ASCOMS) Jammu, Sher-i-Kashmir Institute of Medical Sciences (SKIMS) Srinagar, and Government Medical College (GMC) Hospital, Srinagar, which was scrutinized and analysed. Methods: In this retrospective record review study, the hospital registry entry was regarded suitable for assessing the cancer cases in the J&K. Results: The data comprised of 6,359 patients who had been diagnosed of various cancer conditions between Jan 2016 and Jan 2017, and obtained treatment from the hospitals. Out of all the cancer patients, men were 4038 (63.5%), and women were 2321 (36.5%). In these hospitals, cancers pertaining to the stomach-1551 (24.4%), lung-1498 (23.6%), esophagus and gastroesophageal (GE) junction-872 (13.7%), colorectal-564 (8.9%), lymphomas-41 (26.5%), skin-191 (3.0%), laryngopharynx-165 (2.6%), acute leukemias-230 (3.6%), prostate-94 (1.5%), brain-154 (2.4%), ovary-258 (4.1%), breast-234 (3.7%), gall bladder-136 (2.1%) were the leading sites in order. The lung cancer, throat cancer, stomach cancer and lymphoma were found dominant among males, while in females it was cervical cancer, breast cancer, stomach cancer and lung cancer. Conclusion: The overall incidence of cancer in J&K is on the increase. Cancers of esophagus, stomach and lungs have a high incidence both in men and women in J&K. Future studies on environmental, physiological and genetic factors in relation to these cancers may improve our understanding these malignancies in this state. This will help in the development of better prevention and treatment strategies against these cancers.

Keywords: Cancer, Clinical decision support system, Leukemia, Tamoxifen

Introduction

Cancer is one of the most dreadful diseases and leading cause of death in world [1, 2]. Cancer is a condition in which a group of cells grow abnormally forming a tumor and invade to other parts of the body. Cancerous cells have the ability to bypass the checkpoints in cell cycle [1]. A number of factors are responsible for the development of cancer which causes the mutation of proto-oncogenes or tumor suppressor genes that allow a cancerous cell to row and divide uncontrollably [1]. Some major risk factors of cancers include tobacco consumption, obesity, viral infections, radiation, stress, lack of physical activity, environmental pollutants and genetic factors [1, 3-6].

A lot of research is going on all over the world to develop the treatment strategies for cancer. A number of chemotherapeutic agents are available in the market such as Tamoxifen, Angiostatin, colchicine, etc., which specifically target one or the other pathogenetic pathway of cancer [7, 8]. Radiotherapy is another treatment option in which specific cancer cells are killed [9, 10]. However, there is a big problem with cancer that it remains undetected until its last stage of metastasis which makes it quite difficult to target particular cancer cells that have spread to other body parts [11-13].

J&K is the northern-most state of India. Over the last decade, an increasing trend has been observed in the incidence of cancer in J&K [14]. the major sites of cancer in males are lungs, prostate, colorectal, stomach, esophageal and gastroesophageal tract, while in females major sites include breast, stomach, lungs, esophageal, colorectal, cervical and ovarian cancers [14-19].

There are two main types of cancer screening; Hospital-based cancer registry and Population-based cancer registry. Hospital based cancer registries are meant for recording the information of cancer patients seen in a particular hospital. The main aim of such registries is to contribute to patient care by providing readily available information, maintain case history, treatment procedure and results thereof of the cancer patients. Clinical decision support system (CDSS) is one of the newly developed aspects of hospital registry using information technology. A database of cancer patients containing their overall information is stored in the computers in addition to the handwritten registries, which makes it readily available and accessible for the clinicians [20]. Population-based cancer registry is another method of screening cancer patients in a population of particular region. However, it has certain limitations such as the higher expenditure in surveying and screening different communities for cancer and non-cooperation of local population in such studies.

In the present study, we have made an effort to evaluate the total number of cancer patients in four prospective hospitals of J&K and categorized them on the basis of sex, district, age and cancer groups.

Materials and methods

Hospital registry survey

We chose Hospital-based registry survey [21] to evaluate the number of patients that have been diagnosed with cancer in these hospitals. Hospital-based cancer registries survey is concerned with the recording of information about the cancer patients seen in a particular hospital and has the advantage that it can be used for comparison, estimation and for the elimination of the cancer disease to a major extent in some of the well-reputed referral hospitals [22].

Selection of Hospitals

Four major hospitals of the J&K state were selected for the present study *viz*., Government Medical College (GMC) Hospital Jammu, Acharya Shri Chander College of Medical Sciences and Hospital (ASCOMS) Jammu, Sher-i-Kashmir Institute of Medical Sciences (SKIMS) Srinagar, and Government Medical College (GMC) Hospital Srinagar. The hospitals were selected on the basis of cancer care facilities available and patient rush.

Data collection

Cancer case registration process involved our visits to the oncology departments of the four prospective hospitals of J&K state. The data were scrutinised from the medical records kept in the medical records departments as well as in individual departments concerned with the diagnosis and treatment of cancers. The data of various cancer cases were collected from these hospitals using hospital register entries during the period

Jan 2016-Jan 2017. The results are presented as the number of cancer cases by site, sex, age and district using the hospital registry entries.

Statistical Analysis

Statistical Package of Social Sciences (SPSS) 16.0 version was used to analyze the data. Chi square test was performed and $P<0.05$ was considered significant. The average time for collection and distribution of patient information to the oncologists were also calculated to understand the issues related to the access and availability of information and clinical knowledge and to suggest the better CDSS for improving the information support service process.

Results

Survey findings in four potential Hospitals

a) Government Medical College Hospital Jammu (GMC Jammu)

A total of 1716 cancer patients were observed in GMC Jammu from which the number of male patients was 1125 (65.6%), while as the number of female patients was 591 (34.4%) (Table 1). In this hospital, stomach-403 (23.5%), lung-398 (23.2%), esophagus and gastroesophageal (GE) junction-216 (12.6%), colorectal-102 (5.9%), lymphomas-98 (5.7%), skin-56 (3.3%), laryngopharynx-43 (2.5%), acute leukemias-79 (4.6%), prostate-21 (1.2%), brain-71 (4.1%), ovary-94 (5.5%), breast-83 (4.8%) and gall bladder-52 (3.0%) were the leading sites of cancer (Table 2).

b) Acharya Shri Chander College of Medical Sciences and Hospital Jammu (ASCOMS Jammu)

Our results showed that a total number of 1040 patients were diagnosed with cancer between Jan 2016 and Jan 2017 in ASCOMS Jammu, out of which male patients included 598 (57.5%) and female patients included 442 (42.5%) (Table 1). The leading sites of incidence in cancer patients diagnosed in this hospital were stomach-322 (31.0%), lung-243 (23.4%), esophagus and gastroesophageal (GE) junction-176 (16.9%), colorectal-67 (6.4%), lymphomas-45 (4.3%), skin-31 (3.0%), laryngopharynx-22 (2.1%), acute leukemias-23 (2.2%), prostate-09 (0.9%), brain-13 (1.3%), ovary-43 (4.1%), breast-27 (2.6%) and gall bladder-19 (1.8%) (Table 2).

Table 1: Prominent cancer sites observed in the survey among the four hospitals

S.No.	Hospital Name	Number of Patients		Cancer Sites
		Males	Females	
1.	Government Medical College Hospital Jammu	1125	591	Stomach, Lung, Esophagus and Gastroesophageal (GE) junction, Colorectal, Lymphomas, Skin, Laryngopharynx, Acute Leukaemia, Prostate, Brain, Ovary, Breast and Gall Bladder
2.	Acharya Shri Chander College of Medical Sciences and Hospital Jammu	598	442	Stomach, Lung, Esophagus and Gastroesophageal (GE) junction, Colorectal, Lymphomas, Skin, Laryngopharynx, Acute Leukaemia, Prostate, Brain, Ovary, Breast and Gall Bladder
3.	Sher-i-Kashmir Institute of Medical Sciences Srinagar	1635	878	Stomach, Lung, Esophagus and Gastroesophageal (GE) junction, Colorectal, Lymphomas, Skin, Laryngopharynx, Acute Leukaemia, Prostate, Brain, Ovary, Breast and Gall Bladder
4.	Government Medical College Hospital Srinagar	680	410	Stomach, Lung, Esophagus and Gastroesophageal (GE) junction, Colorectal, Lymphomas, Skin, Laryngopharynx, Acute Leukaemia, Prostate, Brain, Ovary, Breast and Gall Bladder

c) Sher-i-Kashmir Institute of Medical Sciences Srinagar (SKIMS Srinagar)

In SKIMS Srinagar, 2513 cancer patients were observed from which the number of male patients was 1635 (65.1%) while female patients were 878 (34.9%) (Table 1). The leading sites of incidence in cancer patients diagnosed in this hospital were stomach-561 (22.3%), lung-561 (22.3%), esophagus and gastroesophageal (GE) junction-411 (16.4%), colorectal-235 (9.4%), lymphomas-187 (7.4%), skin-78 (3.1%), laryngopharynx-86 (3.4%), acute leukemias-81 (3.2%), prostate-41 (1.6%), brain-58 (2.3%), ovary-91 (3.6%), breast-75 (3.0%) and gall bladder-48 (1.9%) (Table 2).

d) Government Medical College Hospital Srinagar (GMC Srinagar)

In GMC Srinagar, a total of 1090 cancer patients were observed from which the number of male patients was 680 (62.4%) while female patients were 410 (37.6%) (Table 1). In this hospital, stomach-265 (24.4%), lung-296 (27.1%), esophagus and gastroesophageal (GE) junction-69 (6.3%), colorectal-160 (14.7), lymphomas-82 (7.5%), skin-26 (2.4%), laryngopharynx-14 (1.3%), acute leukemias-47 (4.3%), prostate-23 (2.1%), brain-12 (1.1%), ovary-30 (2.8%), breast-49 (4.5%) and gall bladder-17 (1.6%) were the leading sites of cancer (Table 2).

Table 2: Number of cancer cases in four surveyed hospitals

S.No.	Type of cancer	Total number of Patients			
		GMC Jammu	ASCOMS Jammu	SKIMS Srinagar	GMC Srinagar
1.	Stomach	403	322	561	265
2.	Lung	398	243	561	296
3.	Esophagus and GE junction	216	176	411	69
4.	Colorectal	102	67	235	160
5.	Lymphomas	98	45	187	82
6.	Skin	56	31	78	26
7.	Laryngopharynx	43	22	86	14
8.	Acute leukaemia	79	23	81	47
9.	Prostate	21	9	41	23
10.	Brain	71	13	58	12
11.	Ovary	94	43	91	30
12.	Breast	83	27	75	49
13.	Gall bladder	52	19	48	17
	Total	**1716**	**1040**	**2513**	**1090**

Combined Report

The Cancer sites along with the number of patients with respect the sex, age in accordance with each of the four hospitals was confined, and the results were executed in correlation to each other. Our survey in four prospective hospitals of the J&K state *viz.* GMC Jammu, ASCOMS Jammu, SKIMS Srinagar and GMC Srinagar revealed a total of 6359 patients with cancer who reported to these hospitals from Jan 2016 to Jan 2017. The data were observed and collected according to the age, type of cancer, sex of the patient and the districts to which the patients belonged. The highest incidence of cancer was found in the age group 65-69 (1075, 16.91%), followed by 60-64 age group (1053, 16.56%), 55‑59 age group (861, 13.54%) and 50‑54 age group (617, 3.55%) (Figure 1).

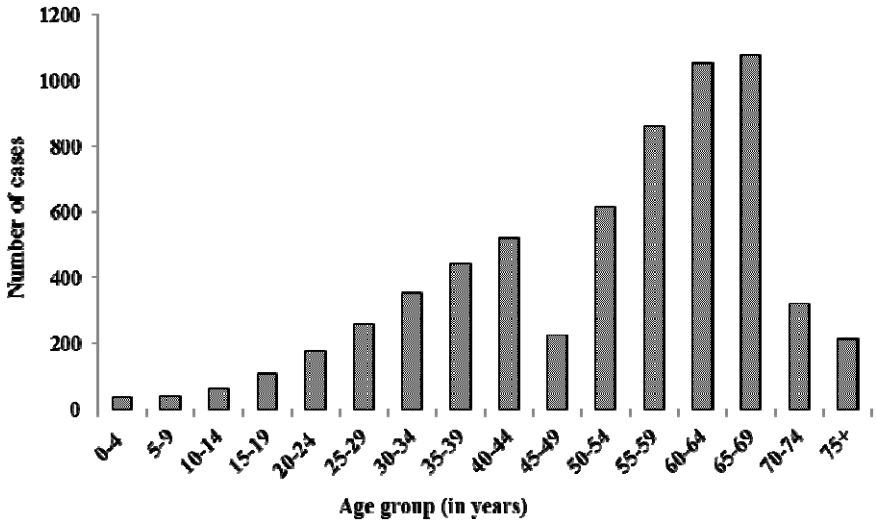

Figure 1: Number of cancer patients with respect to age in four surveyed hospitals

Our results show an increasing trend in the occurrence of disease with age. This also suggests likely increase in number of cancer patients given the expected ageing of our population. There is statistically significant difference based on age (P = 0.01). Out of the total number of 6359 cancer patients, it was observed that the number of male patients was 4038 (63.5%) and that of female patients was 2321 (36.5%). Figure 2 represents the sites of cancer cases in male patients. Our results showed that the major sites of cancer incidence in males was stomach (1102; 27.30%), lungs (912; 22.58%), esophagus and GE junction (641; 15.88%) and colorectal cancer (407; 10.07%) (Figure 2).

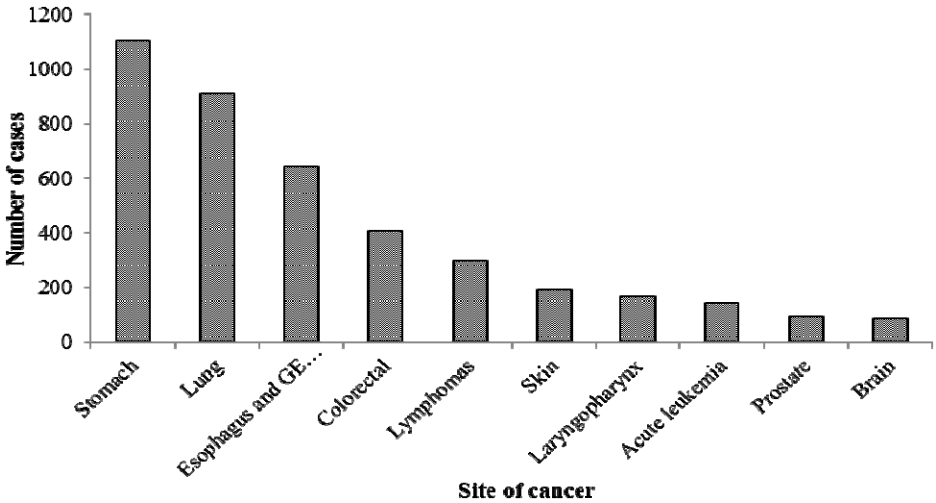

Figure 2: Number of male patients with respect to cancer site in four surveyed hospitals

Figure 3 shows the incidence of cancer cases in female patients. In case of females, the major sites of cancer were found to be lungs (586; 25.24%), stomach (449; 19.35%), ovary (258; 11.12%) and breasts (234; 10.06%). There is overall male predominance (2:1 male/female) of cancer in J&K state (Figures 2 and 3). 50% males had a positive tobacco smoking history.

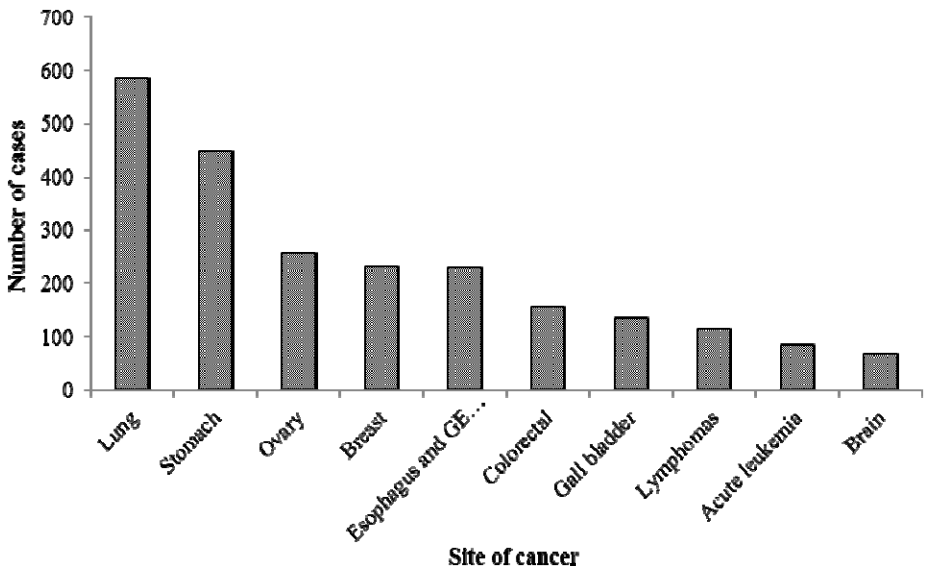

Figure 3: Number of female patients with respect to cancer site in four surveyed hospitals

Only small percentage (7%) of women had a positive smoking history. We also categorized the number of cancer patients according to districts to which they belonged. The results are shown in Figure 4. From our results, we found that the maximum number of cancer patients belonged to the district Srinagar (898; 14.11%), followed by Jammu (853; 13.4%), Baramulla (573; 9.0%), Anantnag (489; 7.7%) and Budgam (452; 7.1%) (Figure 4).

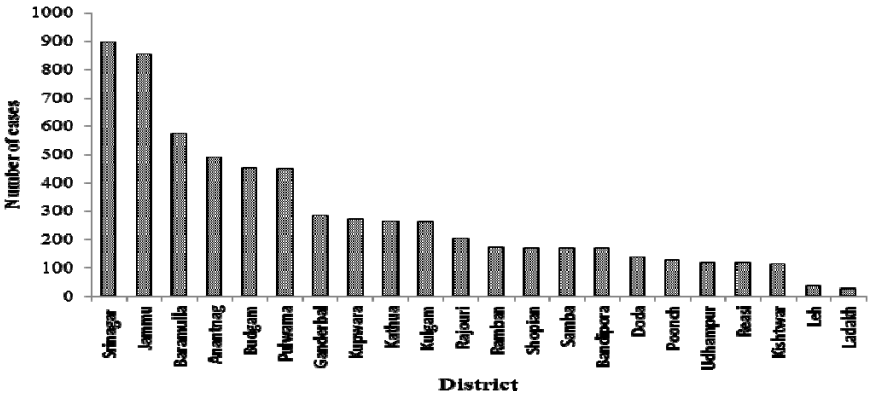

Figure 4: Number of cancer patients with respect to district in four surveyed hospitals

Discussion

Our study showed that in all the four hospitals, the major number of cancer patients were in the age group of 65 to 69 years. This suggests that with the increase in age, the incidence of cancer increases in the population of J&K. Our results are in agreement with previous studies which suggest that the ageing is one of the important risk factors of cancer [(23-26)]. Our results further showed that the majority of cancer patients belonged to the districts of Srinagar and Jammu. We suggest that the Srinagar and Jammu being the capital cities of J&K state have more healthcare facilities as compared to other districts. This allows the local population of these cities to have easy access to the hospitals so as to scrutinize themselves for diseases. Our results also showed that there is overall male predominance (2:1 male/female) of cancers in J&K state. Smoking is a common habit in males

(Rafiq, Shah et al. 2016, Astuti, Wardhana et al. 2017). In accordance with previous studies, our results suggest that smoking is a major risk factor of cancer in males, which is amenable to prevention strategies. Over all, incidence of cancer in J&K showed a distinctly increasing trend over the past decade and the number of cancers diagnosed is expected to double by 2027 [14, 15, 27-30]. Our results further showed that the major sites of cancer incidence in patients were stomach, lungs and esophageal and GE junction in both males and females. Two important risk factors *viz.*, salted tea and tobacco smoking, which are commonly consumed by the ethnic population of J&K, have been shown to play a major role in the development of cancers in stomach, lungs and gastrointestinal tract [31-33]. Besides, prevalence of *Helicobacter pylori* in J&K population needs to be scientifically studied. The other major risk factors of cancer are alcohol consumption, infections, dietary habits and behavioural factors [34]. The major cause of lung cancer is smoking [35]. It is important to introduce tobacco control measures in order to decrease the cancer burden on India. Esophageal and GE junction showed a similar risk in both males and females. Salt tea consumption and improper diet possibly contribute to the increased risk in the population. Chewing of tobacco, smoking and alcohol consumption appear to further aggravate the risk in both sexes [36]. Studies have shown that appropriate changes in life-style can reduce the mortality and morbidity caused by cancer [37-41]. This provides a hope for initiating primary and secondary prevention measures for control and treatment of cancers. Breast cancer and ovarian cancer are the two most frequent cancers in women, accounting for one-third of female cancers [42]. We suggest that genetic and environmental factors may be playing an important role in the development of these cancers in women of J&K [14, 29, 43, 44]. Future studies are warranted to find the role of these factors in breast and ovarian cancer.

Our results further showed that majority of the patients were either at the advanced or late stages of cancer, which makes it difficult for the clinicians to improve the quality of life of these patients and is the main reason for the poor survival from cancer in India [45]. This may be attributed to the lack of cancer education and that of particular disease awareness in the society [46]. The individuals do not report to the hospitals and fail in the identification of cancers in their early stages. So, in some cases, they have been motile and hence the exact number of cancer patients may much more than expected [47].

Conclusion

The cancer cases revealed by our study provide prized information about the control of cancer in the J&K region. The information on leading sites of cancer in population of J&K not only gives a hint about causation, but also provides an insight into the early detection and designing better treatment strategies of these leading cancers, besides initiating preventive measures for the general population. Our study will also help in resource allocation for treatment and prevention of these cancers. We suggest that multidisciplinary approach to early cancer detection and treatment is essential to control this disease, and this has to be made available at all district hospitals and cancer centres. Such an initiative can be started with hospital-based cancer registries and later on expanded into population-based cancer registries. This will be highly beneficial in the overall perspective of planning and assessment of cancer control activities in J&K region.

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Conflict of interests

The authors declare that there is no conflict of interest.

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