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Types and distribution of cancer patients attending in a tertiary care hospital of Bangladesh

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Article Info

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Received: 10 June 2021
Accepted: 30 November 2021
Available Online: 01 February 2022

ISSN: 2224-7750 (Online)
2074-2908 (Print)

DOI: https://doi.org/10.3329/bsmmuj.v15i1.58427

Keywords: Cancer, cancer distribution, BSMMU, Bangladesh

Cite this article:
Sharmin T, Nikhat N, Rayna SE, Khalequzzaman M, Khan FA, Rahman KMT, Islam T, Haque SE, Ahsan H, Kamal M, Islam SS. Types and distribution of cancer patients attending in a tertiary care hospital of Bangladesh. Bangabandhu Sheikh Mujib Med Univ J. 2022; 15(1): 43-49

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Available at:
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A Journal of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Abstract

Bangladesh, similar to other countries is experiencing an increased burden of cancer. Absence of a national cancer registry has created a gap in the information regarding the presentation of cancer statistics of the country. The objective of this study was to assess the types and distribution of the cancer patients attending a tertiary academic medical center hospital in Bangladesh. A cross-sectional study was conducted among all the confirmed cancer patients attending the in-patient and out-patient, and daycare facilities in Bangabandhu Sheikh Mujib Medical University in October, 2019. A validated questionnaire, recommended by International Agency for the Cancer Registry was used to collect data. Written informed consent was obtained from every respondent. This study had received its ethical clearance from Institutional Review Board of BSMMU. Among the 1656 respondents, 78.8% were adult and 25.2% were from paediatric age groups. Leading cancer for adult males were lung cancer (9.6%), leukaemia (9.4%) and lymphoma (9.0%); and breast cancer (28.1%), thyroid cancer (16.1%), and cervical cancer (12.2%) for females. Leukaemia was the most frequent cancer in the paediatric group for both males (71.5%) and females (66.5%). Establishing a hospital-based cancer registry with high quality data in an academic medical center setting is feasible and can set the stage for establishing nationwide hospital-based as well as establishing a population-based cancer registry in Bangladesh, which is necessary to identify and tackle the rising burden of cancer in this country.

Introduction

The estimated global cancer burden accounts for 18.1 million new cases and 9.6 million deaths, in 2018[1], where for the same year in Bangladesh, the number of new cases and deaths were 150,781 and 108,137, respectively.[2] Population-based cancer registries (PBCRs) are the gold standard for obtaining authentic cancer incidence, but is more resource intensive compared to hospital-based cancer registries (HBCRs).[3] In the absence of PBCRs, HBCRs can be utilized to retrieve data on the frequent cancers and improve the cancer care delivery systems in low- and middle-income countries.[3]

In a resource-constrained country like Bangladesh, establishing HBCRs in the medical institutes which serve large populations of the country is more feasible. Bangabandhu Sheikh Mujib Medical University (BSMMU) is the only premiere post graduate university hospital in Bangladesh, where a large number of cancer patients from every region of the country come for quality cancer care, has only an ongoing pathology-based cancer registry. Due to paucity of the data of the cancer burden and cancer care tended by this hospital, as well as demonstrating the feasibility of establishing a HBCR in BSMMU, a cross-sectional study was conducted to assess the types and distributions of the attending cancer patients.

Methods

The present cross-sectional study was conducted in BSMMU, for the month of

October, 2019. Active data collection was done from the respondents with confirmed evidence of clinical, radiological or histopathological cancer attending the in-patient and out-patient departments (OPD), and daycare facilities for cancer care. Data collectors visited the OPD and daycare centers on a daily basis for seeking cancer cases. From in-patient departments, subjects were identified on every alternate day from the departmental registers. Patients with benign tumors, suggestive of having cancer and with pre-cancerous lesions were excluded in this study. A validated questionnaire, recommended by International Association of Cancer Registries (IACR)[4], was used to interview the cancer patients or their family members. From the ongoing pathology-based cancer registry, data regarding the cancer patients who were registered only for diagnostic purposes were retrieved. Written informed consent was obtained from every respondent. Coding of various cancer was done using International classification of diseases for Oncology (ICD-O, 3rd edition, 2000). Data were entered; duplicate cases were excluded, and later analyzed by using Statistical Package for the Social Sciences (SPSS V-23) software. Subjects were grouped into two major groups based on their age as suggested[5], where respondents of 0 to 18 years were classified as pediatric, and 19 and above were adults. Wealth category has been calculated according to Fikree et al. (2001)[6], where it is classified into low, average, and high socioeconomic status. This study had received its ethical clearance from Institutional Review Board of BSMMU.

Results

Data of 1656 respondents were collected from the outdoor, indoor, daycare, pathology, and radiology departments of BSMMU. Among them, the highest proportion (35%) of the patients were interviewed in the OPD, 26% in the indoor department, 20% from pathology and radiology departments, and 19% from daycare centers (data not shown).

Table - I demonstrates the socio-demographic characteristics of the respondents, where 1238 (74.8%) were adults, and 418 (25.2%) were pediatric patients. Among the adults, majority (70.7%) of the respondents belonged to the age group of ≥40 years. The mean age for adult and pediatric subjects was 48.6±14.6 and 7.4±4.2 years, respectively. The male-female ratio for adults and pediatric patients was 1:1.2 and 1.7:1, respectively.

Table - II shows the top ten cancers identified among the adult subjects. Lung cancer was found as the leading cancer among

Table-I

Socio-demographic characteristics of the respondents* (N=1656)

	Adult (n=1238)	Pediatric (n=418)
Age (in years)		
<10		301 (72.0%)
10-18		117 (28.0%)
19-29	126 (10.2%)	
30-39	236 (19.1%)	
40-49	229 (18.5%)	
50-59	296 (23.9%)	
60-69	244 (19.7%)	
≥70	107 (8.6%)	
Mean ± SDa	48.6 ± 14.6	7.4 ± 4.2
Sex		
Male	554 (44.7%)	263 (62.9%)
Female	683 (55.2%)	155 (37.1%)
Transgender	1 (0.1%)	
Male: Female ratio	1:1.2	1.7:1
Marital Status		
Unmarried	73 (6.2%)	403 (98.8%)
Married	1017 (86.3%)	5 (1.2%)
Divorced/ Separated	11 (1%)	
Widowed	77 (6.5%)	
Occupation		
Service Holder	182 (15.4%)	2 (0.5%)
Self-employed	221 (18.8%)	1 (0.2%)
Unemployed/ Retired	99 (8.4%)	179 (43.8%)
Student	81 (6.9%)	225 (55.0%)
Homemaker	595 (50.5%)	2 (0.5%)
Wealth Category		
Low	29 (2.4%)	8 (2.0%)
Average	1041 (88.4%)	389 (95.3%)
High	108 (9.2%)	11 (2.7%)

a SD= Standard deviation

* Data presented as number (%).

adult males (9.6%), with a median age of 60 years at the diagnosis. Histopathologically, squamous cell carcinoma was the most prevalent (34.0%) type of lung cancers in the male. In adult females, 49.7% were suffering from reproductive organ and breast cancers. Breast cancer (28.1%) topped the list of female cancers, with a median age of 46 years at the diagnosis. Morphologically, ductal carcinoma of the breast was the most frequent (71.6%) type. This was followed by cervical cancer (12.2%), and ovarian cancer (6.9%).

Table - III reveals the top five cancers identified among the pediatric age group. Leukemia was the most common cancer for both male (71.5%) and female (66.5%) subjects, with the median age of 6 years at diagnosis for both the sexes. Histologically, the most prevalent type of leukemia was acute lymphoblastic leukemia (ALL) for both male (50%) and female (52.4%).

When the cancers were stratified according to age and sex (Table-IV), leukemia was found to be the most prevalent

Table-II

Top ten cancers in adults

	Males			Females	
Lung	53	9.6%	Breast	192	28.1%
Leukaemia	52	9.4%	Thyroid	110	16.1%
Lymphoma	50	9.0%	Cervix	83	12.2%
Thyroid	39	7.0%	Ovary	47	6.9%
Colon	36	6.5%	Leukaemia	26	3.8%
Stomach	34	6.1%	Lymphoma	19	2.8%
Urinary Bladder	27	4.9%	Stomach	18	2.6%
Rectum	24	4.3%	Lung	17	2.5%
Skin	17	3.1%	Gall Bladder	15	2.2%
Oral Cavity	17	3.1%	Colon	15	2.2%

Table-III

Top five cancers in pediatric population

	Males			Females	
Leukemia	188	71.5%	Leukemia	103	66.5%
Lymphoma	27	10.3%	Bone	18	11.6%
Liver	16	6.1%	Connective Tissue	9	5.8%
Connective Tissue	10	3.8%	Lymphoma	6	3.9%
Kidney	6	2.3%	Liver	3	1.9%

cancer in both sexes of 0-18 years, and also for 40-59 years adult male. Female of age groups 40-59 and ≥ 60 years were found to suffer more from breast cancer (32.8%, 21.7% respectively) and cervical cancer (11.3%, 14.7% respectively). Lung cancer was predominant (13.9%) among males of the age group ≥60 years. Among the cancer patients, majority (53.3%) of them received chemotherapy and the second most common treatment modality was a combination of surgery

Table-IV

Distribution of top five cancers according to age and sex

Rank		Age group (in years)			
		0-18	19-39	40-59	≥ 60
1	Male	Leukemia 71.5%	Lymphoma 18.4%	Leukemia 9.8%	Lung 13.9%
	Female	Leukemia 66.5%	Thyroid 30.5%	Breast 32.8%	Breast 21.7%
2	Male	Lymphoma 10.3%	Thyroid 16.3%	Colon 9.3%	Stomach 9.6%
	Female	Bone 11.6%	Breast 25.5%	Cervix 11.3%	Cervix 14.7%
3	Male	Liver 6.1%	Leukemia 13.5%	Lung 8.8%	Urinary Bladder 9.6%
	Female	Connective tissue 5.8%	Cervix 11.8%	Thyroid 10.6%	Ovary 8.4%
4	Male	Connective tissue 3.8%	Colon 7.8%	Rectum 5.9%	Prostate 8.2%
	Female	Lymphoma 3.9%	Ovary 5.5%	Ovary 7.2%	Thyroid 6.3%
5	Male	Kidney 2.3%	Lung 4.3%	Lymphoma 5.4%	Leukemia 6.3%
	Female	Kidney 1.9%	Leukemia 4.1%	Stomach 2.8%	Lung 5.6%

and chemotherapy (20.7%). Other common treatments modalities observed were surgery (10.5%), a combination of surgery and radiotherapy (9.0%), and radiotherapy (2.7%).

Discussion

This present study was conducted to explore the types and distribution of cancer patients attending BSMMU. The mean age of the adult patients in this study was 48.6 ±14.6 years. Majority (70.7%) of them belonged to the age group of ≥40 years. The reason behind this large proportion of cancer patients may be due to the high prevalence of multiple cancer risk factors at this age, where incidence rates begin to rise for many types of cancer.[7] Various studies done in tertiary hospitals of Dhaka also revealed that the largest age group of cancer patients attending the hospital were above the age of 40.[7,8] In the current study, the male-female ratio in the adult age group was 1:1.2. Higher ratio of females suffering from cancer was also reported by another study conducted in another hospital in Dhaka.[8] On the contrary, the national cancer institute of Bangladesh reported the male-female ratio to be 1.2:1.[9] This discrepancy in the male-female ratio, is possibly due to the increasing number of breast cancer cases and cancers of women of reproductive age over the past few years,[10] early cancer detection programs for breast and cervix[8], and introduction of dedicated female cancer management centers in BSMMU.

The leading cancer identified in the adult male was lung cancer (9.6%), which corresponds to the proportion of lung cancer (11.1%) observed in Globocan 2018-Bangladesh.[2] Breast cancer (28.1%) ranked the highest among all cancers in the females, and is aligned with the national statistics, where it is the most common cancer (19.0%).[11]

The burden of these two cancers were also ascertained by the worldwide incidence data of 2018, where lung cancer in male contributed to 14.5% and breast cancer in female contributed to 24.2% of the new cases diagnosed.[2] Similarly, during the same period, lung cancer (11.2%) and breast cancer (26.4%) ranked highest among males and females of all ages, respectively in the South-East Asia region.[13] An important finding of this study revealed the gravity of female cancers, where the reproductive organ cancers contributed to almost half (49.6%) of all cancers in females. Breast cancer (28.1%) topped the list and other cancers were 21.5% (cervical cancer 12.2% and ovarian cancer 6.9%). The magnitude of the reproductive organ cancers has also been shown in Globocan 2018, where, breast cancer was identified as the most common cancer in 154 of the 185 countries included in Globocan 2018[1] and cervical cancer in 39 countries, all of which are low-middle income countries.[14]

Pediatric patients attending BSMMU had a mean age of 7.4±4.2 years and the proportion of cancers observed was much higher in males than females (male-female ratio 1.7:1), which was also reported in other studies done in Bangladesh.[9,15] Leukemia was identified as the most common (69.6%) cancer in this study, where, male preponderance was observed (65.1% were male and 34.9% female). This finding is concurrent with global data where, leukemias are the most common group of childhood cancers[16,17] in India and 26% in

Pakistan. Nearly half (49.1%) of the leukemia patients suffered from ALL, where the proportion was higher in male than female (63.6%, 36.4%, respectively), which is accordant with other studies.[15,18-20] With regards to the preponderance in male, it may be due to differences in disease biology which could be hormonal or genetic.[18] Also, gender bias in seeking health care might play a role[20], and there are reports about under reporting of childhood cancers among girls.[21] A population-based study has shown that nearly 15–35 % of ALL cases go unreported.[21]

Cancer patients in BSMMU received different modalities of treatment depending on the type of cancers and stages presented in. Chemotherapy was the commonest (53.3%) treatment received by the patients followed by the combination of surgery and chemotherapy (20.7%). Possible reason behind the higher proportion of patients receiving chemotherapy might be due to the higher number of patients attending the indoor and daycare centers of the hospital. Another reason might be the large number of leukemia patients attending where chemotherapy is the first line of treatment.[12] Similar scenario was also observed in another hospital of Bangladesh, where most of the patients were treated with chemotherapy[7] and then with a combination of surgery and chemotherapy.

A study conducted by Parveen et al. (2015) mentioned that the highest proportion (24.3%) of the cancer patients received a combination of surgery, chemotherapy and teletherapy. In contrast to this, in BSMMU, only 1.9% of the cancer patients received the above-mentioned combination therapy. This difference can be explained by the nature of the institution where the afore mentioned hospital was a specialized cancer center.

This study revealed a few challenges, where, absence of automation for data management, and lack of organized structure for storage and access of medical records, was a hurdle for data collection. In many cases, patients and their family members as respondents were hesitant to share information, due to their disconcerted mood in the hospital.

Conclusions

To conclude, lung cancer and breast cancer were the leading cancers among adult male and female, respectively. Leukemia was the commonest cancer for both sexes in the pediatric age group. By ensuring high quality data in academic medical centers, it is feasible to develop a nationwide hospital-based cancer registry as a first stage to establish a population-based cancer registry in Bangladesh, which is necessary to identify and tackle the rising burden of cancer in this country.

List of Abbreviations

ALL: Acute Lymphoblastic Leukemia, BSMMU: Bangabandhu Sheikh Mujib Medical University, HBCR: Hospital-based Cancer Registry, IACR: International Association of Cancer Registries, ICD-O: International Classification of Diseases for Oncology, OPD: Out-patients Department, PBCR: Population-based Cancer Registry, SPSS-Statistical Package for Social Sciences.

Acknowledgements

The authors would like to thank the respondents and their families for participating in the study. We would like to acknowledge all the data collectors who were involved in collecting and reviewing the data. We are grateful to the all the departments of the university and especially to the Department of Public Health & Informatics, Bangabandhu Sheikh Mujib Medical University, for providing valuable support during the research work. We would also like to acknowledge the study and administrative team from The University of Chicago and UChicago Research Bangladesh, for their technical support.

Ethics Approval and Consent to Participate

This study was conducted according to the Declaration of Helsinki and performed after getting official clearance from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (Reference number: BSMMU/2019/7020 and BSMMU/2019/9016). A written informed consent was obtained from every participant providing them with all the details of the research, rights regarding participation, recording of the medical reports of the cancer patients, and the right of the respondent to withdraw from the study, at any stage of the participation. For cancer patients below the age of 18, written assent was sought from the participants, which was also supplemented by obtaining written informed consent from the parents of the participant. A confidentiality pledge was signed by all data collectors and researchers in order to maintain the confidentiality of the data and to protect the patient's rights regarding the privacy of their medical and personal records.

Authors' Contributions

TS, NN, SR contributed to the study conception and method design, coordination, data analysis, data interpretation, and drafted the manuscript, MK(1) to the study conception and design, coordination and supervision of the drafting the manuscript, FK and KR to field coordination and execution, TI, SH and HA to the data interpretation, MK(2) and SI to the

coordination of the drafting of the manuscript, and SI to the study conception and design and revisions of the manuscript. All authors have revised the manuscript and approved the final version.

Competing Interests

Funding

Preparing this manuscript did not require any funding. However, the study was supported financially by Bangabandhu Sheikh Mujib Medical University, though, it does not have any influence on the results.

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