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Socio-demographic profile of Cancer Patients Attending Radiotherapy Out Patient Department of a Tertiary Care Hospital in Kolkata: A Cross-sectional Study

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Abstract

Introduction: Cancer is one of the important challenges of the health system worldwide and especially in developing countries, like India. Sociodemographic factors as well as lifestyle changes can be attributed to the rise of this disease.

Material and Methods: A descriptive cross-sectional study was conducted in the Radiotherapy outpatient department of the NRSMC&H for a period of 1 month on 188 patients. Data collection was done using a predesigned and pretested questionnaire and history regarding socio-demographic Variables, history of comorbidity, family history of cancer in first degree relative/ Type of Cancer/s has been collected.

Results: Organ specific distribution of cancer shows that cancers were commonest in the breast (21.3%). There was a higher breast cancer rate in females (38.8%) and higher lung cancer rate in males (16.7%). Urban residents show a higher proportion of head and neck cancers (23.4%), while rural areas have more gastro-intestinal cases (19.4%). The prevalence of head and neck cancers among those with a history of addiction was 36.7%

Conclusion: Cancer in the study population was concentrated among middle-aged males of lower socio-economic status. Lifestyle factors, particularly tobacco use, were strongly correlated with a higher proportion of head and neck cancers. Distinct gender and geographical variations were marked in many cancer types.

INTRODUCTION

Cancer is emerging as a major public health challenge in developing countries, driven by demographic shifts such as population aging and the widespread adoption of risk-laden lifestyle choices, including tobacco use and sedentary behaviour.^{1,2} India, in particular, is undergoing a significant epidemiological transition, with cancer incidence rising sharply, especially in urban centres where rapid lifestyle modifications and environmental factors have exacerbated the problem.³ According to recent estimates, India accounted for 7.8% of the global cancer burden and 8.2% of global cancer deaths in 2018, earning it the sobering designation of the “Cancer capital of the world”.⁴

The impact of cancer in India extends far beyond the sheer number of cases and fatalities. The disease inflicts profound psychological, economic, and emotional trauma on patients and their families, straining the social fabric and healthcare infrastructure.⁵ The economic burden alone is staggering, with cancer costing the nation an estimated USD 0.8 million annually and projections indicating a substantial increase in both prevalence and associated costs in the coming years.⁶ Urban areas face a higher incidence of cancers linked to lifestyle and behavioural risk factors, while rural populations grapple with limited access to timely diagnosis and treatment, compounding disparities in outcomes.⁷

Despite the magnitude of the problem, there remains a dearth of comprehensive studies examining the clinico-social profiles of cancer patients in India, particularly in those attending tertiary care institutions in West Bengal for treatment. Addressing this gap is essential for planning effective

Keywords: neoplasms, socio-economic factors, cross-sectional studies, co-morbidity, tobacco



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control measures, screening programs, and treatment facilities. It helps to identify which population groups allow for the development of targeted interventions for prevention, early detection, and management of cancer.^{8,9,10}

MATERIALS AND METHODS

Study type and design: The present study was a descriptive study with cross sectional design

Study Setting: Radiotherapy out-patient department of the NRSMC&H. .

Study Period: The study was conducted between 1st April 2024 and 30th April 2024, a period of 1 month.

Study Population: All cancer patients attending the Radiotherapy OPD of NRSMCH.

Inclusion Criteria:

- Cancer patients attending the radiotherapy OPD for first time
- Cancer patients willing to participate in the study

Exclusion Criteria:

- Patients too sick to answer the questionnaire
- First degree relatives of patients being treated at the study setting for cancer

Sample size and sampling technique: Complete Sample size was calculated using the formula for estimation of proportion

$$n = \frac{Z_{1-\alpha/2}^2 * p(1-p)}{d^2}$$

Where,

$Z_{1-\alpha/2}$ = critical value of the Normal distribution at $\alpha/2$

p = proportion of male patients in the study population

d = margin of error

Considering α error of 5%, $p=52.5\%$ (as the proportion of male patients in the study population (based on the study by Puri et al,¹¹) and an absolute error of 10%, the calculated sample size was 150. Adding 20% for incomplete and inaccurate entries, the final sample size as $150+30=180$. However, the final study sample was 188.

Sampling Technique: All eligible patients attending the radiotherapy outpatient department in the study period were recruited consecutively till the desired sample size was reached

Study Tools: The following study tools were used in the present study

- Predesigned and pretested questionnaire
- Prescriptions of the patients

Study Technique: The study participants were interviewed using a

predesigned and pretested questionnaire. Information was obtained about their sociodemographic profile like age, gender, occupation, education, religion family history, socioeconomic status etc. Information was also obtained regarding type of cancer, comorbidity status, history of addiction and scrutiny of prescriptions were done.

Data Collection Method: A total of 33 students went for data collection, they were divided into 6 batches comprising of 5 or 6 students each. Every student took 5 to 6 interviews of the patients from 10:30am to 12:30 pm everyday

Study Variables

- Socio-demographic Variable:* Age in years/ Gender/ Religion/ Residence/Education/Occupation/Total monthly income of family/Socioeconomic status/Marital Status/Type of family/History of addiction/History of comorbidity
- For determining Clinical profile:* Family History of cancer in first degree relative/Type of Cancer(s)

Ethical Issues

As this was a student project, prior to data collection, necessary permissions were obtained from the institutional authorities. Participants were assured of the confidentiality and anonymity of their responses. Those identified to be at high risk for falls or with untreated medical issues were referred to the nearest healthcare facilities for further evaluation and management.

Operational Definitions

- Addiction:* Addiction is a treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences. (American Society of Addiction Medicine)
- Current Disease Status:* It is the perception of the patient regarding improvement in his/her health after the beginning of the treatment.
- Current mode of treatment:* It refers to the mode of treatment which the patient is receiving presently or being followed up for.

Plan for data analysis

All collected data were entered into and cleaned using MS Excel (Microsoft Corp. USA). Mean, Standard Deviation and Percentage were calculated as well as data were presented through table and chart with the help of MS Excel

RESULT

Most of the patients in the study population were between 40-59 year old (51.5%), males (52.1%), of Hindu religion (75%), married (88.3%) and resided in urban areas (66%) in nuclear families (58%). Majority were educated till secondary level (35.6%), homemakers (46.8%), with a monthly family income of 1000-10000 rupees (53.7%). According to the modified BG Prasad scale most patients (29.1%) belonged to the lower socio-economic class. A history of

addiction was found in 34.4% of the patients, while associated comorbidities were reported by 26.6% of the patients. Family history of cancer in first degree relatives was reported by 18.6% of the patients in the study population. (Table 1)

Of the 60 patients who had history of addiction, 72.6% used tobacco (smoked/smokeless/both), 21.7% were addicted to both tobacco (smoked/smokeless/both) and alcohol, while only 13.8% consumed alcohol regularly. Of the 50 patients who had an associated comorbidity, hypertension was seen in 46%, diabetes in 38%, thyroid disorders in 10% and Other like asthma, COPD, anemia, myocardial infarction in 10%.

Organ specific distribution of cancer shows that cancers were commonest in the breast (21.3%), oral cavity (9%) and lung (8.5%) (Table 2). There was a higher breast cancer rate in females (38.8%) (among the females with cancer 38.8% had breast cancer) and higher lung cancer rate in males (16.7%). Urban residents show a higher proportion of head and neck cancers (23.4%), while rural areas have more gastro-intestinal cases (19.4%). The data also highlights disparities, such as a notable prevalence of head and neck cancers among those with a history of addiction (36.7%). (Table 3)

DISCUSSION

Cancer is a major public health problem in India, as well as globally. Epidemiological transition is fueling a rapid increase in the incidence of cancer in many low and middle-income countries like India.¹² Understanding of the socio-demographics of the disease will help in identifying high risk groups, planning preventive services and prioritizing resource allocation for cancers.

In the present study the mean (SD) age of patients was 49.7 (15.7) years with most patients belonging to the 40-59 years (51.1%) and 61-80 years (26.1%) age groups. Similar distribution of patients spanning various age groups, with peaks in the 41-60 year cohort (40.6%) and significant representation in the 61-80-year group (30.4%) were reported by Normen et al,¹³ from an outpatient department of a tertiary care hospital in south India. A retrospective study conducted in patients in a similar setting in northern India, reported maximum number of cancer cases was seen in 6th decade in males and 5th decade in females.¹⁴ Another north Indian study found 43% of patients in the 40-69-year age group followed by 40.1% in the 60-79-year age group.¹⁵

Childhood cancers are defined as cancers occurring in individuals from birth up to 19 years of age. This age range includes both pediatric cancers (affecting infants to children up to age 14) and adolescent cancers (affecting those aged 15 to 19).¹⁶ In the present study 9 of the 188 (4.8%) patients had childhood cancers, similar to the proportion of childhood cancers among all cancers (4.6%) as reported from 96 hospital-based cancer registries (HBCRs) during 2012-19.¹⁷ The most commonly reported cancers were Lymphoma and leukemias, osteo and soft tissue sarcomas and brain tumors (22.2% each). This distribution of cancer is in concordance with other studies from India.¹⁸

An overall male predominance is consistently observed in studies on cancer patients in India, with male-to-female ratios ranging from 41.9% in Northern India,¹⁹ to 85% male representation in head-and-

neck cancer cohorts.²⁰ Gender based distribution of cancers show a higher proportion of head and neck cancer in males (27.8%) compared to females (2.2%). In females the proportion of breast cancer (38.8%) and reproductive tract cancers (20.4%) were substantially higher than males with breast (2.2%) and reproductive tract cancers (1.1%). Another study from Chandigarh, reported the commonest cancer (Ca) in males was Ca lung (40.9) and Ca oesophagus (9.8). In females most common cancer were Ca breast (23.9) followed by Ca cervix (11.7).²¹

The present study cohort also matched cancer cohorts reported from other studies from different parts on India attending similar study settings, in terms of the education, occupation and socioeconomic status.^{22,23}

Common Cancer Types

System wise distribution of cases revealed that in the present study, breast cancer was the commonest (21.3%), followed by head and neck cancers (19.1%). Other systems involved in decreasing proportions were abdomen (18.1%), reproductive system (11.2%), urinary tract (11.2%) lungs (8.5%), brain (5.9%), osteo and soft tissue sarcomas (4.8%) and leukemia and lymphomas (2.1%). Gothwal et al,²⁴ reported head and neck cancers as the most common (30%) in their study cohort from North India, followed by lung (16.6%) and gastrointestinal tract cancers as the 3rd most common group (11.4%). Organ specific distribution of cancer shows that the commonest cancers in the present cohort were breast cancer (33.9%), oral cavity and associated structures like tongue and vocal cords (16.1%) and lung cancers (13.6%). Xavier et al,²⁵ in their tertiary care cancer cohort reported breast (21.3%), liver/bile duct cancers (14.7%) and lung cancer (8.7%) as the commonest cancers. Another retrospective record-based study in Maharashtra by Bangal et al,²⁶ showed that overall cancer cervix was the commonest site (19.5%), followed by cancer breast (10.2%), cancer of the lung (9.7%) and cancer of the floor of mouth (7.3%), in their study population of 205 cancer patients attending the outpatient cancer department of a medical college.

Addictions

In the present study among patients with addiction, the commonest cancers reported were of the head and neck (36.7%), followed by lungs (15%) and urinary tract (15%). Rates of smoking and alcohol consumption in females is significantly lower in males as reported ubiquitously in studies from all parts of India.^{27,28} The higher proportion of oral (head and neck) and lung cancers in patients in males could be due to this higher consumption of tobacco and alcohol addiction among them. Tobacco consumption is regarded as the most important avoidable cancer risk, with 25 and 30% of all cancers in developed countries attributed to tobacco.²⁹ The relation of alcohol and cancer has also been well established in several studies, with higher consumption associated with a greater risk of developing cancer.³⁰ Bangal et al,³¹ observed that most of the patients (47.7%) in their study gave a history of tobacco chewing followed by 42.1% smoking (either cigarette, bidi, or both) and 35.1% betel nut chewing, while 20.4% had a history of alcohol consumption.



Residence

In the present study, two-thirds of the study population had rural residence, while a third were urban residents. In a hospital based cross sectional study from Kerala, Xavier et al,³² reported males in 68.8% and females in 31.2% in their cohort of cancer patients. The present study also found that the distribution of cancers based on residence is fairly similar with almost equal proportion of patients with breast and lung cancers (~20%). A slightly higher proportion of patients with reproductive tract and brain cancers were seen among the rural patients. A population-based cancer registry study from Varanasi, Uttar Pradesh, found that the incidence rates of different cancers varied between rural areas.³³

Co-morbidities

Of the 50 (around 26%) patients that had an associated co-morbidity, hypertension was seen in 23 (46%), diabetes in 19 (38%), thyroid disorders in 5 (10%) and other like asthma, COPD, anemia in 5 (10%). In contrast, the prevalence of comorbidity was found to be 70.2% in a similar study from South India.³⁴ The commonest comorbidity was hypertension (33.9%). Diabetes mellitus was found in 21.9% patients. The difference may be due to the geographical and ethnical variations between eastern and southern India. In a systematic review of a cohort of colon, rectum, lung and Hodgkin's lymphoma in patients from England, the authors reported that up to two-thirds of patients within each of the four cancer patient cohorts had at least one comorbidity, and around half of the comorbid patients had multiple comorbidities.³⁵

History of cancer in first degree relatives

In the present study history of cancer in first degree-relative was present in 17.6% patients. Among them 27.3% of patients with head and neck cancer followed by 21.3% in breast cancer and 12.2% in reproductive tract cancer had a positive family history of cancer. In another study family history was found to be positive in 8.53% cancer patients.³⁶ An estimated 5% of cancers in 2005 were found to have a hereditary component, which is reflected in a family history, especially among first-degree relatives.³⁷ With increasing genetic screening and awareness, increasing numbers are being reported now, like the Western populations

LIMITATIONS

The present study has several limitations. First of all, detailed histopathological type of cancer could not be obtained which itself is an important prognostic factor and also the course of treatment depends on histopathological diagnosis. Also, information about stage or grade of cancer could not be obtained from the prescriptions which would provide a better picture of the etiology, prognosis and clinical course. No test of significance were done, so any association between socio-demographic profile and type of cancer could not be assessed.

CONCLUSION

This cross-sectional study provides valuable insights into the socio-demographic and clinical profiles of cancer patients attending the radiotherapy outpatient department of a tertiary care hospital in Kol-

kata. The study highlights a predominance of patients from rural backgrounds, lower socioeconomic groups, and a slight female majority, with breast and head & neck cancers being the most common diagnoses. A significant proportion of patients reported a history of addiction and co-morbidities, underlining the importance of targeted preventive strategies.

RECOMMENDATIONS

Apart from sociodemographic characteristics like gender, rural residence and low socio economic status, most of the cancer patients had comorbidities and had history of addiction. Thus refraining from addiction like tobacco alcohol as well as prevention, early diagnosis and treatment of comorbidities along with regular screening of the patients with comorbidities for development of cancer should be recommended and promoted among people as an effective preventive strategy.

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CONFLICT OF INTEREST

None Declared

FUNDING

Not declared



Table 1: Socio-demographic characteristics of the study population (n=188)

Variable	Levels	Number	Percentage
Age groups (in years)	≤ 19	9	4.8
	20-39	29	15.4
	40-59	96	51.1
	60-79	49	26.1
	≥80	5	2.6
Gender	Male	90	47.9
	Female	98	52.1
Religion	Hinduism	141	75.0
	Islam	45	23.9
	Others [#]	2	1.1
Residence	Urban	64	34.0
	Rural	124	66.0
Education	Illiterate	41	21.8
	Primary	47	25.0
	Secondary	67	35.6
	HS and above	33	17.6
Occupation	Student	10	5.3
	Homemaker	88	46.8
	Self-employed	48	25.5
	Labour	14	7.4
	Service	14	7.4
	Retired	7	3.7
	Unemployed	7	3.7
Monthly income	1000-10000	101	53.7
	10001-20000	57	30.3
	20001-30000	21	11.2
	30001-40000	4	2.1
	40001-50000	5	2.7
Socio-economic status	Upper class	12	6.4
	Upper middle class	29	15.4
	Middle class	42	22.3
	Lower middle class	51	27.1
	Lower class	54	28.7
Marital status	Married	166	88.3
	Unmarried	18	9.6
	Others ^{\$}	4	2.1
Type of family	Nuclear	109	58.0
	Joint	80	42.6
History of addiction	Present	60	31.9
	Absent	128	68.1
Associated co-morbidities	Present	50	26.6
	Absent	138	73.4
Family history of cancer (in 1 st degree relatives)	Present	35	18.6
	Absent	153	81.4
Total			100

Others include Christians and Sikhs

@ n=60, patients with history of addiction

\$ Others include people who are widowed, separated or divorced

Table 2: Distribution of cancers based on system and organ involved (n=188)

System	Organ	Numbers	Percentage
Abdominal (n=34)	Gall bladder	5	2.7
	Oesophagus	1	0.5
	Stomach	7	3.7
	Rectum/ anal canal	7	3.7
	Colon	6	3.2
	Not specified	3	1.6
	Liver	5	2.7
Brain tumours (n=11)		11	5.9
Breast (n=40)		40	21.3
Head and neck (n= 36)	Oral cavity	17	9.0
	Tonsil	1	0.5
	Eye	1	0.5
	Salivary gland	2	1.1
	Lip	1	0.5
	Neck	10	5.3
	Laryngeal cancer	3	1.6
	Sinonasal	1	0.5
Leukemia and lymphoma (n=4)		4	2.1
Lungs (n=16)		16	8.5
Osteosarcoma _soft tissue sarcoma (n=9)		9	4.8
Reproductive system (n=21)	Ovary	6	3.2
	Penis	1	0.5
	Uterus including fallopian tubes	9	4.8
	Cervix	4	2.1
	Pelvic region	1	0.5
Urinary system (n= 17)	Urinary bladder	4	2.1
	Prostate	9	4.8
	Kidney	3	1.6
	Urinary tract	1	0.5
Total		188	100

(n=188)

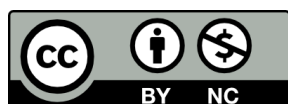
Table 3: Distribution of type of cancer based on clinical variables

Level	Gastro-intestinal	Brain	Breast	Head and neck	Leukaemia and lymphoma	Lungs	Osteo/ soft tissue sarcomas	Reproductive	Urinary	Total
Age Group	≤19	2 (22.2)	0	1 (11.1)	2 (22.2)	0	2 (22.2)	1 (11.1)	1 (11.1)	9 (100.0)
	20-39	8 (27.6)	4 (13.8)	7 (24.1)	0	0	4 (13.8)	1 (3.4)	1 (3.4)	29 (100)
	40-59	18 (18.8)	26 (27.1)	20 (20.8)	0	8 (8.3)	2 (2.1)	14 (14.6)	6 (6.3)	96 (100)
	60-79	7 (14.3)	10 (20.4)	8 (16.3)	2 (4.1)	8 (16.3)	0	5 (10.2)	6 (12.2)	49 (100)
	>80	1 (20)	0	0	0	0	1 (20)	0	3 (60)	5 (100)
Sex	Female	17 (17.3)	38 (38.8)	11 (11.2)	1 (1.0)	1 (1.0)	2 (2.0)	20 (20.4)	1 (1.0)	98 (100.0)
	Male	17 (18.9)	2 (2.2)	25 (27.8)	3 (3.3)	15 (16.7)	7 (7.8)	1 (1.1)	16 (17.8)	90 (100.0)
Residence	Rural	24 (19.4)	27 (21.8)	21 (16.9)	3 (2.4)	11 (8.9)	3 (2.4)	15 (12.1)	10 (8.1)	124 (100.0)
	Urban	10 (15.6)	13 (20.3)	15 (23.4)	1 (1.6)	5 (7.8)	6 (9.4)	6 (9.4)	7 (10.9)	64 (100.0)
History of addiction	No	29 (22.7)	35 (27.3)	14 (10.9)	2 (1.6)	7 (5.5)	3 (2.4)	20 (15.6)	8 (6.3)	128 (100.0)
	Yes	5 (8.3)	5 (8.3)	22 (36.7)	2 (3.3)	9 (15.0)	6 (10)	1 (1.7)	9 (15.0)	60 (100.0)
Presence of co-morbidity	No	26 (18.8)	30 (21.7)	25 (18.1)	4 (2.9)	11 (8)	9 (6.5)	12 (8.7)	10 (7.2)	138 (100)
	Yes	8 (16)	10 (20)	11 (22)	0	5 (10)	0	9 (18)	7 (14)	50 (100)
History of cancer in 1 ^o relatives	No	31 (20)	33 (21.3)	27 (17.4)	2 (1.3)	14 (9.0)	7 (4.5)	17 (11)	14 (9)	155 (100)
	Yes	3 (9.1)	7 (21.2)	9 (27.3)	2 (6.1)	2 (6.1)	2 (6.1)	4 (12.1)	3 (9.1)	33 (100)
Total	34 (18.1)	11 (5.9)	40 (21.3)	36 (19.1)	4 (2.1)	16 (8.5)	9 (4.8)	21 (11.2)	17 (9.0)	188 (100.0)



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