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Study of clinical profile and outcome of malignancy in elderly patients

[1]Dr.Vikram Hatekar, Senior Resident, Department of Medicine, B.J.M.C. and Sassoon General Hospital, Pune.

[2]Dr. D. V. Ogale, MD Medicine, Associate Professor, Department of Medicine, B.J.M.C. and Sassoon General Hospital, Pune.

Corresponding Author: Dr. Vikram Hatekar, Senior Resident, Department of Medicine, B.J.M.C. and Sassoon General Hospital, Pune.

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Abstract

Background: The incidence of malignancy increases with age, and the clinical profile and outcomes in elderly patients with cancer may differ from those in younger patients. This study aimed to examine the clinical characteristics, treatment patterns, and outcomes of elderly patients with malignancy.

Materials and Methods: A prospective observational study was carried out on radiologically and Histopathologicaly confirmed malignancy cases of age > 65 years. A sample size of 80 was estimated using 0.1% prevalence and type 1 error of 1%.

Results: Total 80 cases with slight male preponderance (58.75 % males vs 41.25 % females) were enrolled. 37.5% of patients had hypertension, 22.5% were diabetic, and 8.7% had chronic kidney disease. The most common (23.75%) malignancy was breast cancer, followed by prostate cancer (12.5%), colorectal (11.25 %) and cervical cancer (11.25%), 8.75% % had bladder and stomach cancer each, and the remaining 6.25 % had Lung , 6.25 % oral cancer , 3.75% kidney cancer and in 5% cases lymph nodes were involved. The majority of the patients (42.5%) received chemotherapy, 31.25% received radiotherapy, 27.5% received supportive care, 16.25 %receiving hormone therapy, and the remaining 15% patients underwent surgery. The mortality at 6 months follow up was 11%. Average Charlson Comorbidity Index (CCI)was significantly higher in mortality group.($p<0.001$)

Conclusion: This study has shown that breast cancer was the commonest type of malignancy. CCI is a satisfactory indicator of prognosis in elderly patients with malignancy.

Keywords: CCI, WHO, Cancer.

Introduction

The aging population implies important changes at various levels. From the ancient years to the 19th century, human life expectancy doubled from 20 years to 40

years. However, this life expectancy doubled fast to 80 years from the 19th century to the 20th century and continuously increased in the 21st century.[1] This fact implies important socioeconomic and health challenges. Aging entails a greater need to care for aspects related to primary aging (physical changes due to aging) and to secondary aging (ailments with risks increase in old age).[2]

Based on estimates reported by The World Health Organization (WHO), people aged 65 years and over will be expected to reach 800 million in the year 2025 [3].

Undoubtedly, cancer risk increases exponentially with age. About 60% of cancers occur in people 65 years of age or older. Furthermore, about 70% of the deaths caused by cancers occur in this stage. Therefore, cancer is a disease of old age.[4] Taking into account the increase in cancer occurrence and the quality of life among the elderly population, a special approach is necessary for the diagnosis, treatment, and survival of elderly patients with cancer.

Because of disproportionately high incidence of most cancer types in older adults, [5-6] cancer care for older patients has attracted increasing attention. Geriatric oncology can be considered a specific expertise within clinical oncology [7] but since most cancers occur in older people, it is important that all oncologists and health-care workers are aware of the particularities within this domain. Geriatric oncology presents unique age-specific challenges, including competing health and socioeconomic factors, but also age-related changes in tumour biology that might have an effect on screening, diagnosis, treatment, and outcome.

Based on the report released by WHO, and International Cancer Research Institute in the year 2012, approximately 14 million new cases were seen in the whole world, while this figure will be expected to rise to 22 million within the next 20 years leading to an increase in the global cancer burden. As a consequence of growing, and ageing population, an important part of this increase is predicted to concern developing countries. Because of limitations in the application of screening programs, early diagnosis, and access to treatment, further increases in the incidence of cancer, and cancer-related mortality rates have been foreseen [8-9].

In cancer therapies of geriatric patients, presence of other concomitant health problems of elder individuals (cardiovascular diseases, diabetes etc) can effect treatment decisions. Presence of these medical problems, chemotherapy, radiotherapy, and surgery can increase the risk of post-treatment complication rates. Other additional factors as life expectancy, and drug interactions should be also taken into account [10].

Therefore this study was planned in the tertiary care centre to study the clinical profile and various types of malignancies in elderly patients.(Age> 65 years) and to study the prognosis and outcomes of malignancy in them.

Aims And Objectives

1. To Study the clinical profile and various types of malignancies in elderly individuals of age> 65 years.
2. To study the prognosis and outcomes of malignancy in elderly patients.

Materials And Methods

Source of Data: The study was done in elderly patients with cancer who are histologically and radiologically proven and admitted in wards or taking treatment from day care ward in a tertiary care centre.

Inclusion Criteria

- Age >65 years (no upper age limit)
- Consented for Study

Exclusion criteria.

- Age ≤ 65 years.
- Patients not consenting to be included in the study or refusing treatment.

Method of collection of data

- Study type: A prospective observational study
- Duration: 18 months

Study Procedure

1. A complete history of the patients fulfilling inclusion criteria was registered.
2. History of presenting complaints, addictions, existing comorbid conditions, past history and history of existing medications was noted.
3. The history of planned treatments viz. chemotherapy, radiotherapy, hormonal therapy. supportive palliative care and 15% surgeries undertaken was noted.
4. Occurrence of adverse events during treatment and follow up period was noted.
5. Follow up was done till 6 months and major events like death or major adverse events were noted.
6. Charlson Comorbidity Index (CCI) calculation was performed. The scoring of CCI was done using an online calculator. Following scoring items were used.

The total score of the CCI consists in a simple sum of the weights, with higher scores indicating not only a greater mortality risk but also more severe comorbid conditions.

Appendix Table 1: Charlson Comorbidity Index Conditions and Weights

Conditions	Weights
Myocardial Infarction	1
Congestive Heart Failure	1
Peripheral Vascular Disease	1
Cerebrovascular Disease	1
Chronic Obstructive Pulmonary Disease	1
Dementia	2
Paraplegia and Hemiplegia	1
Diabetes	1
Diabetes with Complications	2
Renal Disease	2
Mild Liver Disease	1
Moderate or Severe Liver Disease	3
Peptic Ulcers	1
Rheumatic Disease	1
Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS)	6
Cancer	2
Metastatic Solid Tumor	6

Sample Size

Calculation of sample size was done as per the Fisher's formula.

Sample Size (n) = Z^2PQ/L^2

For 99 % confidence interval the value of Z=2.576

Calculation of Prevalence/Incidence (P): As per the Cancer Statistics, 2020: Report From National Cancer Registry Programme, India, (94), 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). Since we are considering both the genders, we considered incidence of 100 per 100,000.

Thus, incidence (P) = 0.1%

Q= (100-P) =99.9%

L=Type 1 Error percentage. We considered type 1 error of 1%.

Sample Size= 2.576x2.576x0.1x99.9/1x1 , Sample Size=66.29

To make provision for the incomplete or inaccurate data, withdrawal of consent, drop out and loss to follow up etc an estimated 20% is added to the calculated sample.

Therefore, the final sample size came to 66.29+0.2x66.29=79.55. Rounded off to 80.

Statistical Analysis Method

Primary data was collected using paper-based Case Report forms. Collected data was entered in the Microsoft Excel spreadsheets 2016. Statistical analysis was performed on IBM SPSS STATISTICS VERSION 20.

Categorical variables were taken in the form of frequencies and percentages and cross tabulations were done for the chosen parameters and column proportions were compared using Chi square test.

Distribution was represented by pie charts or bar graphs. Continuous variables were expressed in the descriptive statistics tables as means, standard deviation, median, maximum and minimum value. Average values were compared using independent sample t test.

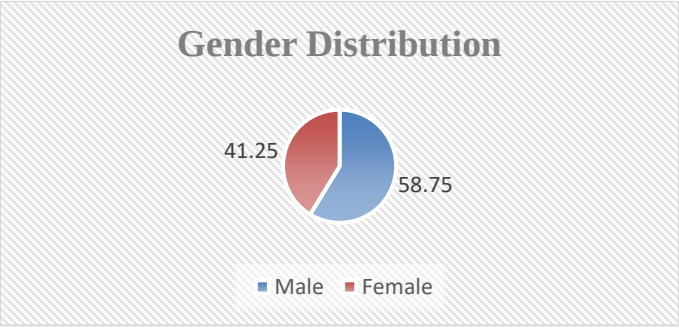
P value < 0.05 was considered significant and p value < 0.01 was considered highly significant.

Observations and Results.

This prospective Study enrolled total 80 Patients of age > 65 years of age having Histopathological and radiological confirmed malignancy. The cases were followed up for six months and the Observations of the study were tabulated as follows.

Table 2: Gender Distribution

Gender	Number	%
Male	47	58.75
Female	33	41.25

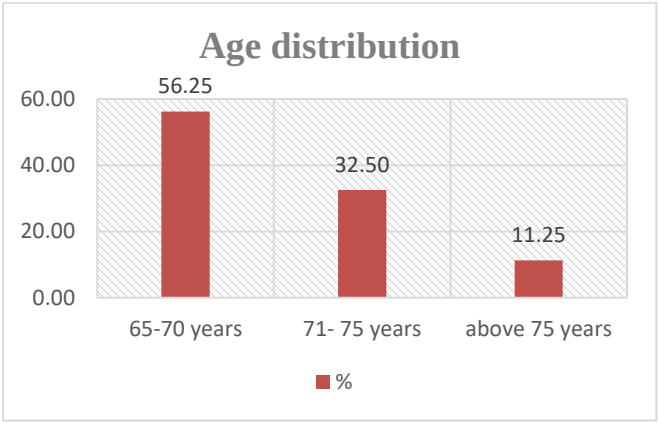


There was male preponderance with total 58.75 % males and 41.25 % females.

The gender ratio (M: F) was found to be 1:0.7.

Table 3: Age distribution of the study population

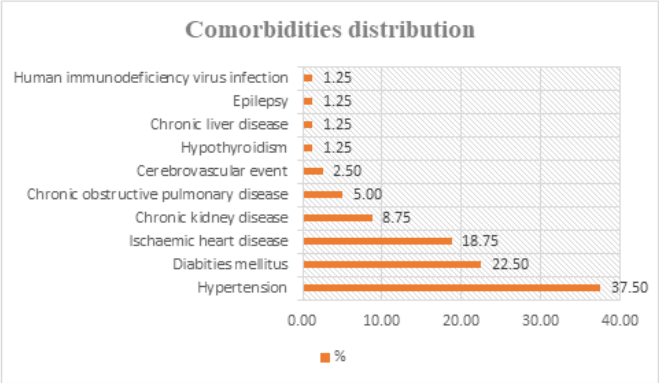
Age	Number	%
<65-70 years	45	56.25
71- 75 years	26	32.50
above 75 years	9	11.25
	Mean	SD
	70.55	3.52



There were 56.25% of patients who were 65 to 70 years old, 32.5% were in the age group 71-75 years and remaining11.25 % patients were older than 75 years. The average age of the patients was 70.55±3.52.

Table 4: Distribution of comorbidities of the study participants.

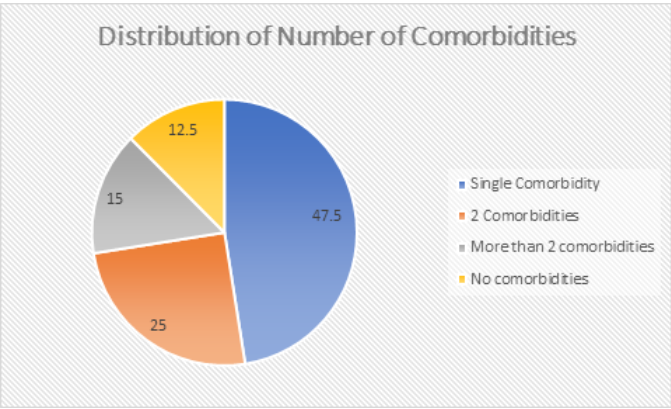
Comorbidities	Number	%
Hypertension	30	37.50
Diabetes mellitus	18	22.50
Ischaemic heart disease	15	18.75
Chronic kidney disease	7	8.75
Chronic obstructive pulmonary disease	4	5.00
Cerebrovascular event	2	2.50
Hypothyroidism	1	1.25
Chronic liver disease	1	1.25
Epilepsy	1	1.25
Human immunodeficiency virus infection	1	1.25



The commonest comorbidity found among the cases was hypertension (37.5%). 22.5% cases were diabetic. Ischaemic heart disease was present in 18.75% cases and Chronic kidney disease was present in 8.75%. 5% had history of COPD and 2.5% had suffered cerebrovascular events in the past. the remaining patients had various comorbid diseases. 1 known case of each Chronic liver disease, epilepsy and HIV infection was found.

Table 5: Distribution based on number of comorbidities

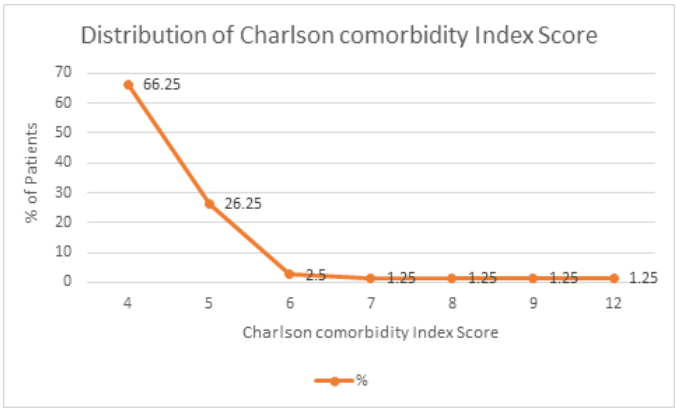
Comorbidities	Number	%
Single Comorbidity	38	47.5
2 Comorbidities	20	25
More than 2 comorbidities	12	15
No comorbidities	10	12.5



There were total 87.5% patients with at least one comorbidity. 47.5% had single comorbidity, 25% had 2 associated comorbidities whereas 15% had more than 2 comorbidities. Only 12.5% cases were devoid of any comorbidity.

Table 6: Distribution of Charlson Comorbidity Index Scores

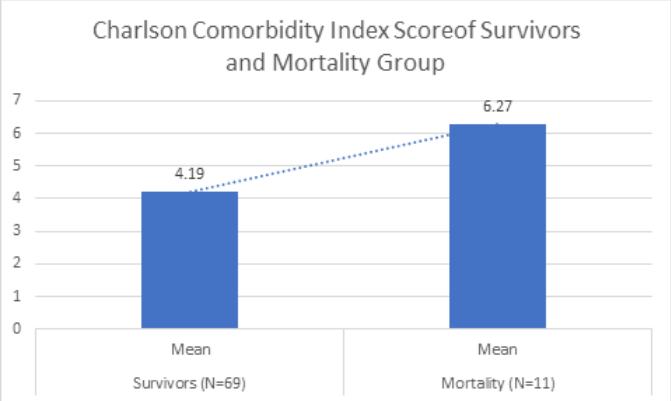
Charlson comorbidity Index Score	Number	%
4	53	66.25
5	21	26.25
6	2	2.5
7	1	1.25
8	1	1.25
9	1	1.25
12	1	1.25



The minimum score noted was 4 and maximum was 12 .66.25% cases had CCI Score of 4 and 26.25% had CCI Score of 5 . CCI score of 2,7,8, 9 and 12 was found in one patient (1.25%) each.

Table 7: Comparison of average CCI score between 6 months mortality cases (N=11) versus survivors. (N=69)

	Survivors (N=69)		Mortality (N=11)		p
	Mean	SD	Mean	SD	
Charlson Comorbidity Index Score	4.19	0.58	6.27	2.61	<0.0001



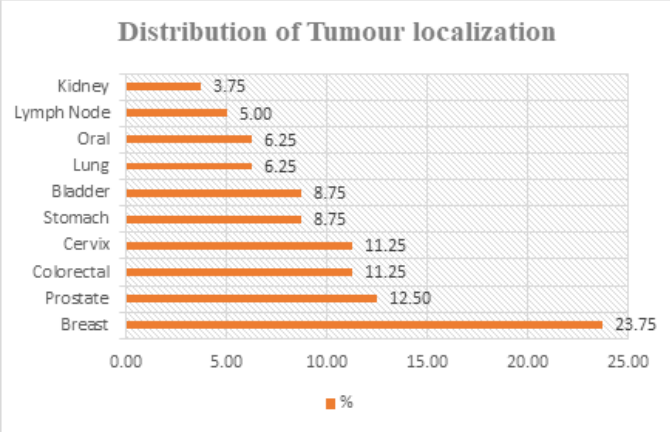
The average CCI in survivors was 4.19±0.58 whereas in mortality group average CCI was 6.27±2.61 . The mean difference between average CCI score was statistically significant. (p<0.001)

Table 8: Distribution of Symptoms.

Constitutional Symptoms	Number	%
Loss of weight	32	40
Fever	23	28.75
Loss of Appetite	19	23.75
Easy Fatiguability	15	18.75
Pain Symptoms	Number	%
Chest Pain	13	16.25
Abdominal pain and vomiting	2	2.5
Bleeding Manifestations	Number	%
Bleeding per vagina	8	10
Hematemesis	5	6.25
CNS Symptoms	Number	%
Altered sensorium	9	11.25
Limb weakness	3	3.75
Dizziness	2	2.5

Table 9: Distribution based on localization of Primary tumor.

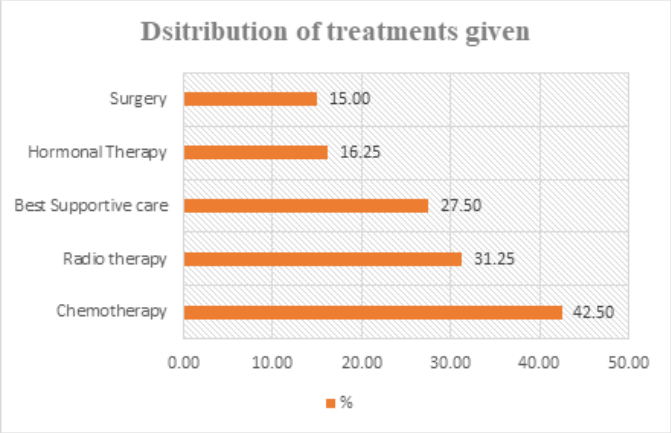
Localization	Number	%
Breast	19	23.75
Prostate	10	12.50
Colorectal	9	11.25
Cervix	9	11.25
Stomach	7	8.75
Bladder	7	8.75
Lung	5	6.25
Oral	5	6.25
Lymph Node	4	5.00
Kidney	3	3.75



The most common malignancy noted (23.75%) was breast cancer. It was distantly followed cases of prostate cancer (12.5%).11.25 % had colorectal and cervical cancer, 8.75% % had bladder and stomach cancer each, and the remaining 6.25 % had Lung , 6.25 % oral cancer , 3.75% kidney cancer and in 5% cases lymph nodes were involved.

Table 10: Distribution of treatments given to the patients

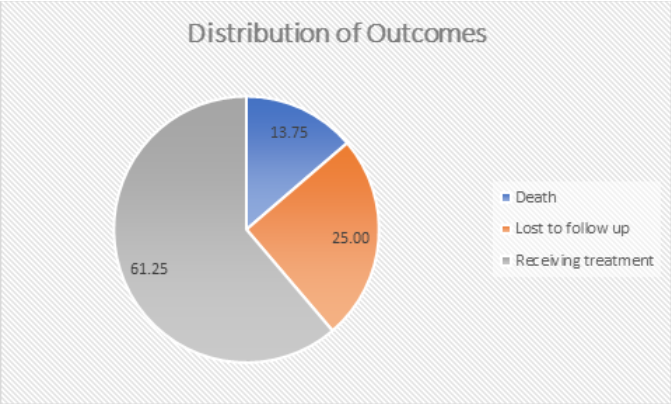
Treatment Given	Number	%
Chemotherapy	34	42.50
Radio therapy	25	31.25
Best Supportive care	22	27.50
Hormonal Therapy	13	16.25
Surgery	12	15.00



The most common treatment given (42.5%) was chemotherapy followed by radiotherapy which was received by 31.25% cases, 27.5% received supportive palliative care and 16.25 % received hormonal therapy. 15% of the total patients underwent surgery.

Table 11: Distribution of outcomes.

Outcome	Number	%
Receiving treatment	49	61.25
Lost to follow up	20	25.00
Death	11	13.75



After the follow up for nearly 6 months, 13.75% of cancer patients died and 61.25 % cases were continuing with follow up visits for treatments whereas 25% cases were lost to follow up.

Table 12: Compliance to treatment and adverse events

Treatment Compliance	Number	%
Completed prescribed treatment	70	88.5%
Interruptions in the treatment	10	11.5%

88.5% of all patients completed the prescribed treatment without any interruption whereas there was interruption in the treatment among 11.5% patients.

Discussion

The reason for increasing attention for cancer care for older patients is because of disproportionately high incidence of most cancer types in older adults, [5-6].

In cancer therapies of geriatric patients, presence of other concomitant health problems of elder individuals (cardiovascular diseases, diabetes etc) can affect treatment decisions. Presence of these medical problems, chemotherapy, radiotherapy, and surgery can increase the risk of post-treatment complication rates. Other additional factors as life expectancy, and drug interactions should be also taken into account [10].Therefore this study was planned in the tertiary care centre to study the clinical profile and various types of malignancies in elderly patients.(Age> 65 years) and to study the prognosis and outcomes of malignancy in them.

In our study, there was male preponderance with total 58.75 % males and 41.25 % females. The gender ratio (M:F) was found to be 1:0.7. In another study conducted by Wilson *et al.(*2021), 62% of the patients were males.[11]Another study conducted by Vasanth *et al.(*2018), out of 200 patients, 123 were males and 77 were females, which was in concordance with our study. [12]

In our study, maximum 47.5% of cancer patients admitted to the hospital were admitted for less than a week, followed by 26.25% on a day-care basis, 20% for

longer than a week to a month, and the remaining 6.25% for longer than a month. In another study conducted by Wilson *et al*.(2021), 80.52% of the patients were admitted to the hospital for less than a week, followed by 18.89% of the patients were admitted for more than a week to less than a month and 0.59% of the cases were admitted for more than a month. [11]

Majority of the patients (37.5%) of patients had hypertension, 22.5% had diabetes, 18.75% had IHD, 8.75% had CKD and 5% had COPD in our study.In another study conducted by Emilio *et al.(*2019),comorbidities of cardiovascular origin (hypertension and ischemic heart disease) were most frequent, at 82 patients (40%), followed by diabetes mellitus (39 patients; 19%) and dysthyroidism (27 patients; 13%)..[13]Another study conducted by Vasanth *et al*.(2018), most of the participants had neurological diseases 102 (51%), followed by endocrinological diseases 98 (49%), cardiovascular diseases 97 (48.5%), respiratory diseases 93 (46.5%), genitourinary diseases 73 (36.5%), gastrointestinal diseases 46 (23%), haematological diseases 41 (20.5%), and musculoskeletal diseases 31 (15.5%).[12]

The majority of the patients (42.5%) were receiving chemotherapy, 31.25% were receiving radiotherapy, 27.5% were receiving the greatest supportive care, 16.25 % were receiving hormone therapy, and the remaining 15% patients underwent surgery in our study.In another study conducted by Emilio *et al*.(2019), the treatments used were chemotherapy in 80 patients (39.2%), biological therapies in 13 patients (6.4%), radiotherapy in one patient (0.5%), and all three modalities in 15 patients (7.4%). Half of the population underwent surgery. Sixty-five percent of the patients received one or two lines of chemotherapy.[13]

After the follow up for nearly 6 months, 13.75% of cancer patients died and 61.25 % cases were continuing with follow up visits for treatments whereas 25% cases were lost to follow up. In another study conducted by Wilson *et al*.(2021), 21.07% of the patients died and 64.81% of the patients were discharged from the hospital.[11]

The minimum score noted was 4 and maximum was 12 . 66.25% cases had CCI Score of 4 and 26.25% had CCI Score of 5 . CCI score of 2,7,8, 9 and 12 was found in one patient (1.25%) each.

The average CCI in survivors was 4.19±0.58 whereas in mortality group average CCI was 6.27±2.61 . The mean difference between average CCI score was statistically significant. ($p<0.001$)

This study confirms the importance of assessment of an elderly patient before starting any treatment. As most patients with increased CCI Scores died within 6 months of follow up.

Patientshaving a poor nutritional status and additional comorbidities have poor outcomes compared to patients having good nutritionalstatus and lesser comorbidities.

Our findings corroborated the findings of study by Chan CH et al [14] known as RESORT study which performed the association of comorbidity indices (CCI) with mortality using Cox regression analyses in geriatric rehabilitation patients. It was found that incremental CCI and CCI-A scores were associated with higher mortality in all three cancer status groups. However, patients with active cancer had a significantly higher 3-month mortality compared to those with no or past cancer, and this is likely determined by the advanced nature of the malignancies in this group.

Conclusion

This study has shown that breast cancer was the commonest type of malignancy in patients above the age of 65. Prostate, colorectal, and cervical cancer too were found in high numbers in the elderly population. Therefore, the need for screening for breast, prostate, colorectal and cervical cancer is warranted in suspected cases in elderly population.The prognosis and outcomes are largely depended on preexisting comorbidities and the Charlson comorbidity Index was found useful in understanding the prognosis of these cases.

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