The clinical features and outcomes of COVID-19 in patients with cancer

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Objective: A clinical features and outcome of cancer patients through new Corona Virus Disease (COVID-19) were the focus of this retrospective investigation.

Materials and methods: 52 cancer patients with COVID-19 had medicinal report, laboratory data, and radiologic findings that were gathered, summarized, and used to determine clinical features and outcomes. There were 50 cancer individuals overall with COVID-19. The 52 COVID-19's median age-positive cancer patient was 65 years old (34 years–98 years). There were 33 (3%) mild patients and 19 (5%) severe patients.

Results: The most common cancer kind (11%) was lung cancer. Fever (14%) was among the most prevalent symptoms, followed by a dry cough (10%), chest discomfort (7%), and fatigue (6%). The most prevalent symptom in 33 (63.5%) patients with comorbidities was hypertension (18%). At the time of admission, 26 patients (70.8%) had pneumonia. Patients with mild and severe conditions had a reduction in lymphocytes (0.6109/L). C-reactive protein, procalcitonin, D-dimer, and lactate dehydrogenase had median values of 318 U/L, 2.8 mg/L, 70.5 mg/L, and 0.3 ng/mL, in that order. These values substantially improved in severe patients compared to moderate patients. Interleukin-6 levels varied significantly (13.6 pg/mL), rising in mutually moderate and severe individuals.

Conclusion: The problems that were seen in 29 (50.8%) of the patients. 11 cancer sufferers (20.2%) lost their lives. Infection rates for the severe discriminating respiratory pattern coronavirus 2 were greater in cancer patients than in the universal populations, and patients with COVID-19 had worsening symptoms and less favourable outcome.

Keywords: infection, COVID-19, cancer, SARS-CoV-2

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INTRODUCTION

The healthcare systems are in front of severe problems of the COVID disease 2019 (COVID-19) pandemic, especially for sensitive groups like cancer patients. Due to their weakened immune systems, continuing therapies, and underlying medical disorders, cancer patients have special concerns and dangers when it comes to COVID-19. A demographic of special concern during the COVID-19 epidemic is cancer patients. Researchers and healthcare professionals are concerned about their vulnerability to both the direct effects of COVID-19 disease and the possible interruptions in growth treatment [1]. The case death rate is often greater in COVID-19 cancer patient who need hospitalization than in the overall residents. Increased death rates among COVID-19 optimistic cancer patients have been documented in many studies, notably for older patients, those with advanced disease, and those with concomitant conditions. A person immune system may become weakened by cancer, rendering them more prone to infections and respiratory viruses like SARS-CoV-2. Additionally, COVID-19 problems are more likely as the immune system is further weakened by cancer therapies such chemotherapy, immunotherapy, and radiation therapy [2]. The invulnerable organization strength becomes destabilized and general health can be precious by cancer and its therapies. Cancer patients can be more susceptible to infection due to their condensed resistant system and can also have less wellorganized viral suspicion. Severe COVID-19, which explains why older adults are more likely to be diagnosed with cancer and age-related physiological changes, lower organ function, and a greater occurrence of comorbidities can all be present in older patients and raise [3]. The protected system can become weakened as an outcome of cancer and its therapy, production it more difficulties for the body to fight touching infection. This cooperation immune system might augment the chance of experience severe COVID-19 consequences and symptoms. Preexisting comorbidities, such as respiratory disorders, diabetes, or cardiovascular disease, are general in cancer patients. When paired with COVID-19, these underlying medical disorders can raise the risk of severe consequences and illness even more. Important initiative to decrease the risk of serious sickness in this susceptible group comprise the accomplishment of rigorous infection control measures, individualizing treatment programs, and guaranteeing prompt access to medical care [4].

Hospitals have been compulsory to give COVID-19 care

first priority, which has outcome to the postponement or a relationship between the kind of cancer a patient has and the postponement of non-urgent operations like cancer treatment therapies they get. and surgeries. The necessary cancer care can be belated as a result of this prioritizing. Due to the important threat of COVID-19 exposure, cancer patient can be more wary about visiting hospitals and other healthcare facilities. Patients can avoid critical medical care, such as and treatment visits, out of fear of catching the virus, regular checkups, and screenings [5]. This virus was given the moniker, which also contains other viruses that are known to infect people with respiratory disorders. Though it is separate from the original virus, the virus's name, SARS-CoV-2, shows its striking resemblance to the original SARS coronavirus. Understanding the epidemic and taking appropriate action required the discovery of SARS-CoV-2 as the responsible agent. It enabled researchers and healthcare experts to create diagnostic tests [6]. It may be determined whether treatment-related variables contribute to worse outcomes by examining whether dead cancer patients were undergoing cancer therapy at the time of their death or had just finished it.

Symptoms and consequences of COVID-19

It is possible to pinpoint particular symptoms linked to higher mortality by comparing the symptoms of cancer patients who passed away with those of survivors. Additionally, studying the prevalence of serious side effects like Acute Respiratory Distress Syndrome (ARDS) failure might provide information about the development of the illness and the dangers it entails [7]. Furthermore, factor counting quarantining medical personnel as of possible virus disease or rerouting them to COVID-19 treatment amenities to fulfil the increasing command contribute to the decrease accessibility of physician outside Wuhan. Healthcare services in other areas were impacted by the rerouting of medical resources to the outbreak core. Redistribute medical staff and possessions, giving precedence to urgent and significant healthcare services, and putting in place telemedicine or distant discussion technology to supply patients health check guidance and support distantly are just a few of the steps taken to address these problems [8]. Cancer patients and its treatments, such as chemotherapy or radiation therapy, may impair the immune system. A greater chance of developing a serious disease and developing acute complications may be brought on by a damaged immune system. The results for COVID-19 patients are poorer for cancer patients who often have underlying comorbidities including cardiovascular disease, diabetes, or respiratory issues. When cancer patients get the virus, the existence of these co morbidities might significantly raise the risk of acute consequences. Some cancer treatments, especially immunosuppressive or specific targeted medicines, might worsen immune system dysfunction or have an immediate Patients impact on the respiratory system [9]. The epidemic has disrupted cancer therapy, causing changes to treatment plans, postponements of procedures, and restrictions on access to medical facilities. These setbacks may jeopardize patient outcomes and affect the efficacy of cancer therapy. During the pandemic, cancer patients might face increased stress, worry, and panic. Patients may have a considerable psychological and emotional toll as a result of the uncertainties about COVID-19, modifications to treatment regimens, and worries about increased susceptibility. Resources Data collection for mental health and supportive care are essential for resolving these issues [10]. In evaluation to the universal population, cancer patients have unique or more severe symptoms, and there may be

Research looked on the mental health issues experienced by cancer patients who were diagnosed during the COVID-19 epidemic [11]. In one of the biggest cancer hospitals in China, a collect example, cross sectional investigation of 6224 cancer patients was carried out. The sociodemographic, clinical, psychosomatic, interpersonal, and social support factors, as well as the psychological stress brought on by the COVID-19 infection and the state of one's mental health, were all assessed. The results of the current research showed a significant incidence of mental health issues and service gaps for cancer patients, which also suggested a high level of discomfort from COVID-19-raised hazards. Study evaluates the Cancer care throughout the pandemic, using data obtained in Asia and Europe, the frontlines of the program of the COVID-19 pandemic [12]. Several changes have been made to cancer wards in an effort to continue cancer diagnosis, treatment, and research while protecting patients and healthcare personnel against COVID-19 infection. Research determines the clinical data was gathered from hospital and population health databases [13]. Hospitalization, IMV, and mortality were studied using uni-variate and multi-variate logistic deterioration, with chances ratios and 95% confidence interval computed to determine which factors were significantly connected with each outcome. Study examines the patients COVID-19 vaccinations in trial participants receiving experimental cancer treatments is urgently required [14]. Getting a COVID-19 vaccination shouldn't be in conflict with participating in cancer clinical studies. Cancer patients who are presently engaged in, or who may join in the future, require operational assistance from clinical trial sponsors, investigators, and treating doctors about immunization against COVID-19. Vaccination is anticipated to have considerably more positive effects than negative ones because to the high affliction and fatality from COVID-19 patients. Study investigates Cancer patients were additional possible to pass away from coronavirus 2019 (COVID-19), according to population-based research conducted in China and Italy [15]. Despite the fact that there is a lack of information on the characteristics of cancer and its conduct amplify the likelihood of severe COVID-19. This data is essential for striking a compromise between the dual safety concerns of limiting SARS-CoV-2 exposure and maintaining cancer therapy. 423 symptomatic cases of COVID-19 were identified between March 10, 2020, and April 7, 2020, at Memorial Sloan Kettering Cancer Centre.

MATERIALS AND METHODS

In 2020, 52 people with COVID19-positive cancer were COVID-19 is identified. Patients were only included if they tested positive for SARS-CoV-2 in a laboratory using quantitate invalidate transcript polymerase sequence response on swabs taken from their nasal passages. According to the degree of COVID-19, patients were separated into 2 groups: the severe group and the mild group.

Medical data, test findings, and chest CT scans of COVID-19positive cancer patients were gathered. A unique data collection form was used to gather all of the data that was then sorted and organized. The correctness of the data was checked by two **cancer patients** researchers who looked through the forms separately.

Statistic evaluation

The data was analysed using SPSS 20.0. The data was presented as means \pm SD or medians (IQRs). The differences among the group were analysed with the learner t test. The cutoff for numerical implication was situating at p<0.05.

RESULTS

Tab. 1. Cancer COVID-19

Fundamental characteristics of COVID-19

The detection and action of cancer patients underlying cancer may be made more difficult if they exhibit COVID-19 symptoms. The detection and treatment of cancer patients' underlying cancer

The detection and treatment of cancer patients' underlying cancer may be made more difficult if they exhibit COVID-19 symptoms. Information as of 1585 COVID-19 patient revealed 50 incidences of cancer caused by SARS-CoV-2 (3.5%). Table 1 and figure 1 shows the demographics of 50 people diagnosed with cancer, with a median age of 65 (range: 34-98), 28 men and 24 females, 33 moderate cases and 19 severe cases.

tients positive for	Clinical Features	No. (%)				
	Medium age	64				
	Years (Age)					
	20 Years-40 Years	1-53				
	41 Years-60 Years	20/53				
	61 Years-80 Years	29/53				
	>80 Years	5-53				
	Gender					
	Men	29				
	Women	25				
	Cancer Treatment Under A Few Weeks					
	Mild patients (N = 33)	3				
	Severe patient (N = 19)	5				
	Death	12				
	Chest CT exhibited hazy or scattered darkness	27				
	Ground Glass Cancer Type					
	Lung cancer	11				
	Breast cancer	10				
	Rectal cancer	9				
	Colon cancer	6				
	Cervical cancer	5				
	Thyroid carcinoma	4				
	Gastric cancer	3				
	Liver cancer	3				
	Prostate cancer	8				
	Signs and Symptoms					
	Fever	14				
	Dyspnea	4				
	Pharyngalgia	3				
	Fatigue	6				
	Headache	4				
	Chest distress	7				
	Myalgia	2				
	Diarrhea	2				
	Dry cough	10				



Fig. 1. Features of several cancer types

had fever, 17.3% had dry cough, 11.5% had chest pain, 9.6% had total of 15 out of the 20 severe patients with comorbidities. tiredness, 5.8% had headaches, 5.8% had dyspnoea, 3.8% had pharyngalgia, 1.9% had myalgia, and 1.9% had diarrhoea. On admis-CT scans, such as patchy shadows.

Among 52 patients, lung cancer accounted for 19.2%, breast can- disease (5, 13.1%), persistent pulmonary obstruction (3, 6.2%), cer for 17.3%, rectal cancer for 15.4%, colon cancer for 9.6%, hypothyroidism (2, 3.1%), chronic renal insufficiency (2, 3.1%) cervical cancer for 7.7%, and thyroid carcinoma for 5.8%. These and cirrhosis (1, 3.0%). The ten individuals with serious condicancer patients reported the following clinical symptoms: 25% tions who passed away all had one or more comorbidities, for a

Laboratory findings

Multiple chronic conditions

Tab. 2. COVID-19 cancer patient lab results

sion, 26 patients (78.8%) displayed abnormalities on their chest The test results obtained upon admission displays in table 2 and figure 2. It revealed that the median values for 50 patients white blood cell counts and neutrophil counts, respectively, were 5.9 \times 109/L and $4.3 \times 109/L$, respectively, and that both values were There were 35 patients (63.5%) who had comorbidities. Hyper- typically within the normal range. Between severe patients (0.8 tension (17, 51.5%) was the most prevalent comorbidity, follow \times 109/L) and moderate (1.9 \times 109/L), there was an important by diabetes (8%), coronary heart disease (6%), cerebrovascular distinction in the medium level of lymphocyte calculate (p<.05).

	Median (IQR)				
	Normal Range	p value	Mild (n = 33)	Several Critical (n = 19)	Total (N = 52)
Alanine Aminotransferase, U/L	10-51	30	33	0.99	30
Aspartate Aminotransferase, U/L	16-41	25	33	0.12	31
C-reactive Protein, mg/L	0.11	71.6	10.7	0.02	23.9
Creatinine, mmol/L	58-112	75	58	0.1	60
Interleukin-6, pg/mL	<22	34.8	10.3	<.06	12.7
D-dimer, mg/L	<0.56	2.9	1.1	<.06	1.9
Cardiac Troponin I, ng/mL	0-0.06	0.02	0.02	0.12	0.02
Lymphocyte Count, × 109/L	1.1-3.5	1.5	0.11	0.04	0.8
Procalcitonin, ng/mL	<0.12	0.32	0.07	<.06	0.12
White Blood Cell count, × 109/L	3.6-10.6	7.9	5.9	17	5.9
CD8+T Lymphocyte, μL	221-1130	130	2018	0.04	201
CD4+T Lymphocytes, μL	404-1615	256	374	0.07	274
Lactate Dehydrogenase, U/L	121-255	319	217	24	2.39
Neutrophil Count, × 109/L	1.9-6.9	5.9	3.7	15	4.5



Fig. 2. Outcomes of the lab results

Table 2 shows that the median numbers of CD4+T cells and mild (p>.05). 8 patients had myocardial damage, however cardiac CD8+T cells were, respectively, 280 per micro litre and 200 per troponin I testing revealed no variation among severe and modermicro litre. 25 individuals saw a drop in CD4+T cells overall, ate patients (p>.05). with the lowest level being $78/\mu$ L, after which there was a drop in CD8+T cells in 15 individuals, the lowest number being 37/micro litre. There was no noticeable difference between the individu- Patients suffering from cancer who have COVID-19 have a damals classified as moderate or severe (p<.05). Interleukin-6 (IL-6) levels significantly differed among severe patients (34.8 pg/mL) and moderate (10.2 pg/mL) (p<.05). C-Reactive Protein (CRP), es. In order to effectively manage these issues, prompt detection D-dimer, Procalcitonin (PCT), and Lactate Dehydrogenase and management are both essential. According to table 3 and fig-(LDH) median values in severe patients were 313 U/L, 1.3 ng/ ure 3, every patient got antiviral medication, and 47 (90.4%) also mL, 71.5 mg/L, and 2.9 mg/L. respectively, considerably higher received antibiotics, glucocorticoid therapy, and immunoglobulin than those in mild patients (p>.05). Despite the fact that 4 pa- therapy. Of the remaining patients, 16 (30.8%) also received antitients had renal insufficiency and 19 patients had liver damage, the viral therapy. data revealed no discernible variation among severe patients and

Tab. proce

The treatment and complications

aged immune system and an underlying health problem, both of which put them at an increased risk of having serious consequenc-

3. COVID-19 cancer treatment		No. (%)				
dures and results		Mild (n=34)	Total (N=52)	p value	Severe/Critical (n=20)	
	Treatment					
	Chemotherapy	5	7	<.06	3	
	Resection	2	3	>.06	2	
	Catheter Ablation	2	2	0.46	1	
	Cancer	2	2	0.46	1	
		Outcomes				
	Discharge	34	42	<.002	10	
	Death	1	12		12	
	Complications					
	Liver Injury	13	20	0.98	8	
	ARDS	1	10	<.002	10	
	Sepsis	4	9	0.07	6	
	Myocardial Injury	3	9	0.06	7	
	Shock	1	4	0.04	4	
	Renal Insufficiency	1	5	0.27	4	
		Oxygen Support				
	Noninvasive Ventilation	20	39	0.002	20	
	Invasive	1	1	NA	1	
		Mechanical Ventilation Immunotherapy				
	Antiviral Therapy	34	53	NA	20	
	Antibiotic Therapy	29	48	0.09	20	
	Glucocorticoid Therapy	6	17	0.002	12	
	Immunoglobulin	3	14	<.06	12	
	CKRT	2	2	0.19	2	



Fig. 3. Comparison of cancer treatments

ment was included in patients with chronic renal failure. 10 pa- myocardial damage occurred more often (p<.05). tients (19.4%) had cancer therapy within a month. Chemotherapy was given to 6 of them (11.5%), while the other 4 patients each underwent one of the following treatments: catheter ablation, resec- The death tempo of COVID-19-positive cancer patients was tion, pancreatic duodenectomy, and immunotherapy. 39 (73.1%) patients underwent non-invasive ventilation; no patient received ing discharges. The length of time beginning the inception of invasive ventilation or extracorporeal covering oxygenation. 29 pa- symptoms and the patient's passing, which we refer to as the metients (55.8%) had sequelae, including liver damage (29%), Acute dian survival time, was 17.5 days ± 9.8 days for serious patients. Respiratory Distress Syndrome (ARDS), sepsis, cardiac injury There was a range of 5 days-45 days for the survival period. The (8%), renal deficiency (5, 7.8%), and several organ dysfunction percentages of patients' endurance that are shown in figure 4 are syndromes, among others. Only very ill or critically ill people de- broken down by severity.

The treatment for one patient (1.9%) continuous kidney replace-veloped ARDS. In severe patients compared to moderate patients,

Outcomes

22.2%, with 11 severe patients dying and all mild patients receiv-



Fig. 4. Comparison of mild and severe survivors

DISCUSSION

The Cancer patient is more vulnerable to disease throughout the viral outbreak because of their weakened immune systems. According to Chinese research, around 1% of SARS-CoV-2 infected people developed cancer, which is 5 times the country's average rate. According to a recent Italian investigation, over 20% of SARS-CoV-2-infected patients who passed away had a history of cancer that was active during the previous 5 years. According to reports, 19.0% of those with SARS-CoV-2 will develop clinically severe illness, and almost semi (49.0%) of these belongings will In conclusion, those who have cancer have a higher threat of be fatal. the median patient age was 65 years old, and the primary constricting SARS-CoV-2 than the universal population does. signs and symptoms following SARS-CoV-2 infection were fever, Patients through cancer are susceptible to severe pneumonia and cough, chest discomfort, exhaustion, headache, etc. Ten of the 50 other respiratory infections due to the immune suppressive effects cancer patients had lung cancer, whereas nine others had breast, of their illness and the chemotherapy and radiation treatments nine rectal, nine colorectal, nine cervical, etc., indicating that they undergo to treat it. Complications such as liver damage, lungs cancer patients had a significant disease incidence in this sepsis, renal insufficiency, ARDS, MODS, and myocardial injury research, which was consistent with other results. Hypertension, are ordinary in cancer patients who have COVID-19, which may follow by heart disease, cerebrovascular disease, and diabetes was enhance the possibility that they may become severe. During this the majority frequent comorbidity among 52 cancer patients. The time of the epidemic, we need to pay attention to those who are disease manages and avoidance noted to facilitate major underly- afflicted with cancer. ing conditions including diabetes, chronic lung disease and heart

disease may raise the threat of severe consequences in the elderly and in persons of any age. Our findings demonstrated that cancer patients' laboratory tests exhibited the following traits: reduced lymphocytes, elevated PCT, D dimer, IL-6, CRP, and LDH. The inflammatory indicators have increased, which suggests that the infected individuals were experiencing inflammation at the time, which may have been strongly tied to the inflammatory storm.

CONCLUSIONS

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