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ORIGINAL ARTICLE

CLINICAL PRESENTATION AND OUTCOME OF COVID-19 INFECTED CANCER PATIENTS: A PROSPECTIVE STUDY

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Abstract:

Background: *Patients with active cancer are considered to be a high-risk group during the COVID-19 pandemic. Reports of studies on the impact of COVID-19 infection on cancer patients in Bangladesh are sparse. This study was conducted to describe the clinical presentation and assess the outcome of COVID-19 infected cancer patients.* ***Methods:*** *In this prospective study, we enrolled 43 patients with active cancer from different cancer hospitals in Dhaka, Bangladesh who were tested positive for RT-PCR of COVID-19. The study period was from August to October 2020 (three months) following ethical approval and informed written consent was ensured. The data were collected in a structured questionnaire form by interviewing the patients/ relatives and from medical records of inpatient and outpatient departments and analyzed by SPSS version 25.* ***Results:*** *The mean age of the 43 study participants was 49.2 (±13.6) years with a male predominance (60.5%). The common primary malignancies were leukaemia (27.9%), carcinoma of the colon (18.6%), and carcinoma of the breast (14%). Diabetes (30.2%) and hypertension (27.9%) were the common co-morbidities. The most frequently found symptoms were fever and cough 67.4% each. Severe and critical illness were found in 27.9% and 2.3% cases respectively. 35 (81%) patients survived from COVID-19 and death was observed in 8 (19%) patients.There was no significant association of age, gender, primary malignancy type, and major co-morbidities with the outcome. Severe and critical illness were found to be significantly associated with higher mortality.* ***Conclusions:*** *COVID-19 related mortality is higher in cancer patients than in the general population. Mortality depends on the severity of COVID-19 in these patients, associated with severe & critical cases.*

Key words*: Severity, outcome, COVID-19, cancer, Clinical presentation*

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Introduction:

The emergence of a new pandemic Coronavirus Disease 2019: "COVID-19" has changed the world in 2020. After the outbreak in Wuhan, China in 2019[1]it has spread to 213 countries affecting over 75.12 million people. By December 20,over 1.68 million deaths were reported since the start of the pandemic.[2]In Bangladesh 500713 confirmed cases and 7280 deaths are reported with an overall case fatality rate of 1.45% by December 20.[3] COVID-19 is a viral illness caused by an RNA virusnamed severe respiratory distress syndrome-2 (SARS-CoV-2).[4] It is highly contagious having a basic reproduction number (Ro) of 2.68%.[5] The receptor for the virus, angiotensin-converting enzyme 2 (ACE2), is widespread allover different organ systems. So more deaths from COVID-19 have been caused by multiple organ dysfunction syndrome (MODS) rather than respiratory failure.[6]

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Patients with cancer are more susceptible to infection than individuals without cancer because of their systemic immunosuppressive state caused by the malignancy and anticancer treatments, such as chemotherapy, radiotherapy, or surgery. Therefore, these patients might be at higher risk of COVID-19 and have a poorer prognosis.The severity and prognosis vary largely between groups,with age over 60 years and co-morbidities includinghypertension, diabetes, cardiovascular disease, and cancer.[6]

As cancer patients are considered to be a high-risk group in COVID-19 infection special attention and care are required for them.A retrospective cohort study from Wuhan, China has reported severe events (53.6%) and ahigh mortality rate (28.6%) of COVID-19 infected cancer patients. Patients who got anti-tumour therapy within 14 days ofthe infection had an increased risk of severe events.[4] However, in the UK a large prospective cohort study was conducted which showed no such association if chemotherapy was given within four weeks of COVID-19 infection.[7] Another study from the UK reported an increased risk of death due to COVID-19 related hospital admission in patients with haematological malignancies who got chemotherapy within four weeks of infection.[8]Among patients with COVID-19, thosewith cancer haveworse outcomes compared with thosewithout underlying malignancy, but mortality rates differed significantly among studies, ranging from 3.7% to61.5%.[9,10]

To date, there have been a few studieson the effect of COVID-19 on cancer patients in Bangladesh.

This prospective study was done to find out the clinical characteristics and outcome of COVID-19 infected cancer patients in Dhaka, Bangladesh.

Methods:

Study design and participants

This prospective studywas conducted from August to October 2020 (three months). 43 adult patients (aged e" 18 years) with active cancer were enrolled in the study from different cancer hospitals both government and private ones in Dhaka, Bangladesh.As per the interim guideline by the World Health Organization (WHO) patients who were reverse transcription-polymerase chain reaction (RT-PCR) positive for COVID-19 on nasopharyngeal or oropharyngeal swab were included in the study.[11]Patients with clinical or radiological diagnosis of COVID-19 without a positive RT-PCR were excluded.

Patients with active cancer were defined as those with cancer treated within the past 12 months with surgery, cytotoxic chemotherapy, or radiotherapy.[12]

Data collection

The prospective data were collected in a structured questionnaire formby direct interview of the patients/ relatives and from medical records of the inpatient and outpatient departments of different government and non-government hospitals in Dhaka. Informed written consent was taken before the collection of data.

Ethical consideration

The ethical clearance was received from the ethical review committee. The confidentiality and anonymity of the study participants were maintained throughout.

Statistical analysis

Quantitative and qualitative variables were presented as mean with standard deviation and number with percentage, respectively. Association was assessed with risk ratio, and Fisher's exact test and Student's unpaired T-test were conducted on qualitative and quantitative variables, respectively, and a two-sided p-value<0.05 was considered statistically significant.All statistical analysis was carried out using SPSS version 25.

Results:

The mean age of the study participants was 49.2 (±13.6) years with a male predominance (60.5%). The common primary malignancies were leukaemia (27.9%), carcinoma of the colon (18.6%), and carcinoma of the breast (14%). Most of the study participants did not have any co-morbidity (60.5%). Diabetes (30.2%) and hypertension (27.9%) were the common co-morbidities. About 11.6% had both diabetes and hypertension, and 4.7% had obstructive airway disease (asthma/chronic obstructive pulmonary disease) along with diabetes and hypertension.The most frequently found symptoms were fever and cough 67.4% each. Dyspnoea, diarrhoea, anosmia, and fatigue were found in 30.2%, 9.3%, 2.3%, and 2.3% of individuals respectively. (Table I)

Chest radiography including chest X-ray and high resolution computed tomography (HRCT)chest were done in most patients. The commonest X-ray abnormality was consolidation(34.9%) including bilateral and unilateral basal involvement. Bilateral ground-glass opacities onthe HRCT chest were found in 7% of patients.

The severity of illness was categorized using WHO guidelines as mild, moderate, severe, and critical.[11]Among the patients, 27.9% had severe COVID-19. The rest were asymptomatic (23.3%), mild (23.3%), moderate (23.3%), and 2.3% of the cases were critical.(Table I)

Table I

Clinical characteristics of the patients (n=43)

Clinical characteristics of the patients	Patients (n=43)
Mean age-years (±SD)	49.2 (±13.6)
Gender-no. (%)	
Male	26 (60.5%)
Female	17 (39.5%)
Primary malignancy-no. (%)	
Leukaemia	12 (27.9%)
Carcinoma of colon	8 (18.6%)
Carcinoma of breast	6 (14.0%)
Lymphoma	4 (9.3%)
Other alimentary tract carcinomas	4 (9.3%)
Carcinoma of unknown primary	3 (7.0%)
Renal cell carcinoma	2 (4.7%)
Multiple myeloma	1 (2.3%)
Female genital tract carcinoma	1 (2.3%)
Papillary carcinoma of thyroid	1 (2.3%)
Carcinoma of lung	1 (2.3%)
Co-morbidities-no. (%)	
Diabetes	13 (30.2%)
Hypertension	12 (27.9%)
Asthma/COPD	3 (7.0%)
Ischaemic heart disease	2 (4.7%)
Chronic kidney disease	2 (4.7%)
Hypothyroidism	2 (4.7%)
Deep vein thrombosis	1 (2.3%)
Connective tissue disease	1 (2.3%)
Symptoms-no. (%)	
Fever	29 (67.4%)
Cough	29 (67.4%)
Dyspnoea	13 (30.2%)
Diarrhoea	4 (9.3%)
Anosmia	1 (2.3%)
Fatigue	1 (2.3%)
Severity-no. (%)	
Asymptomatic	10 (23.3%)
Mild	10 (23.3%)
Moderate	10 (23.3%)
Severe	12 (27.9%)
Critical	1 (2.3%)

*COPD=Chronic obstructive pulmonary disease

81% of the patients survived from COVID-19, whereas death was observed in 19% of study participants. (Figure 1)

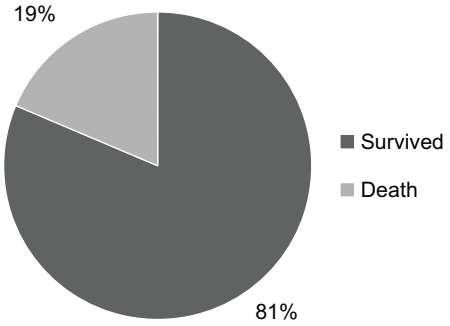

Fig.-1: *Outcome of COVID-19 in cancer patients (n=43*

There was no association of age, gender, primary malignancy type, and major co-morbidities with the outcome.(Table II)

Table II

Association of clinical parameters and outcome in COVID-19 infected cancer patients (n=43)

Clinical parameters	Case fatality rate (n=8)	p-value
Mean age (±SD)-years		
49.7 (±14.9)	8 (18.6%)	0.9
Gender		
Male 26 (39.5%)	6 (23.1%)	0.3
Female 17 (60.5%)	2 (11.8%)	
Primary malignancy		
Haematological	5 (29.4%)	0.1
malignancies 17 (39.5%)		
Solid-organ malignancies	3 (11.5%)	
26 (60.47%)		
Co-morbidities (n=43)		
Diabetes 13 (30.2%)	3 (23.1%)	0.5
Hypertension-12 (27.9%)	3 (25.0%)	0.4
Ischaemic heart disease	1 (50%)	0.3
-2 (4.7%)		

Severe and critical illness were found to be associated with high mortality (risk ratio 37.6, 95% CI 2.3-607.7, p-value <0.0001).(Table III)

Table III

Association of the severity of COVID-19 and outcome in cancer patients (n=43)

Severity	Death	Alive	Risk ratio	95% CI	p-value
Severe & critical	8	5	37.6	2.3-607.7	<0.0001*
Non-severe	0	30			

*Fisher's exact test

Discussion

The COVID-19 pandemic has disrupted the care of cancer patients in many ways. Many studies are done on large scale in different countries to find out the demographic characteristics and outcome of COVID-19 infected cancer patients. In our study,the mean age of the study population was49.2 (±13.6) years with a male predominance (60.5%).Lee et al. in a study from the UK have found that increasing age and being male were associated with high mortality.[7] Aries et al. have also reported that patients over 70 had higher mortality.[13] However, we did not find any such association in our study.

In the current study, the common co-morbidities were diabetes (30.2%) and hypertension (27.9%).A study from the UK suggested an association of increased risk of death among patients with hypertension and cardiovascular disease.[7]Another study from the UK also reported high mortality in patients with an increasing number of co-morbidities.[13] However, no such association was observed in the current study.

In our study, no significant difference was found between the case fatality rate of the patients with haematological malignancies (29.4%) and solid-organ malignancies(11.5%).This finding is similar to an American cohort study which did notsuggest increased mortality from COVID-19 in patientswith haematological malignancies.[14] However, this finding contrasts with a UK cohort study which found increased mortality of COVID-19 infected patients with haematological malignancies.[8]

In the current study,27.9% of patients had severe COVID-19. The rest were asymptomatic (23.3%), mild (23.3%), moderate (23.3%), and 2.3% of the cases were critical.A study from the UK has also reported 23% of the cases as severe COVID-19. They reported 22% cases as critical and 52% as mild cases. In our study, 87.5% of patients who died belonged to the severe illness group and the rest (12.5%) belonged to the critical category. These findings are different from the UK study where more patients suffering from critical illness died (62%).[7]

The severity of illness and mortality had a significant association, This finding is similar to the study in the UK.[7]

In our study, 81% of the patients survived from COVID-19, whereas death was observed in 19% of study participants.The study by Lee et al showed 28% death in COVID-19 infected cancer patients.[7] Another study by Kuderer et al. has shown 13% death.[14] A systematic review has shown the probability of death of 25.6% of such patients.[15]

Limitation: The small sample size is the limitation of our study.

Conclusions:

The mortality of COVID-19 infected cancer patients was driven by the severity of illness. Though the mortality in cancer patients is high in our study, the majority of the patients have survived. Further study witha large sample size and comparison between cancer and non-cancer patients withCOVID-19 infection could reveal more useful information.

Declarations:

Supplementary Materials: Available on request

Conflict of Interest:

The authors stated that there is no conflict of interest in this study

Funding: This research did not receive any external funding.

Ethical consideration:

The study was conducted after approval from the ethical review committee. The confidentiality and anonymity of the study participants were maintained.

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Consent of publication: All the authors have given written consent for publishing the research.

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