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Original Article

Outcomes of Patients with COVID-19 in a Tertiary Care Hospital of Bangladesh

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Abstract:

Coronavirus Disease-2019 (COVID-19) has disseminated throughout Bangladesh. This study aimed to provide a detailed account of outcomes of patients with COVID-19 who were hospitalized during 2020-2021 in Bangabandhu Sheikh Mujib Medical College Hospital, Faridpur, Bangladesh. This prospective observational study evaluated outcomes of 500 hospitalized patients with COVID-19. Patients with COVID-19, confirmed by positive Reverse Transcriptase Polyremase Chain Reaction (RT-PCR) reports of nasopharyngeal swab were enrolled in this study. Outcomes of the patients were evaluated by 7-point ordinal scale provided by World Health Organization. Mean age of the respondents was 45.70 (±14.50) years. Out of 500 patients, 331 (66.2%) were male and 169 (33.8%) were female. Common comorbidities were overweight or obesity (191, 38.2%), hypertension (173, 34.6%), diabetes mellitus (163, 32.6%), smoking (90, 18.0%), ischemic heart disease (IHD) (70, 14.0%), asthma (36, 7.2%), chronic obstructive pulmonary disease (COPD) (28, 5.6%), chronic kidney disease (CKD) (18, 3.6%), stroke (12, 2.4%), malignancy (6, 1.2%) and chronic liver disease (CLD) (5, 1.0%). Out of 500 patients, 238 (47.6%) patients had mild disease, 124 (24.8%) patients had moderate disease, 130 (26.0%) patients had severe disease and 8 (1.6%) patients developed critical COVID-19. Among the respondents, 299 (59.8%) patients required low flow oxygen by face mask or nasal prongs, 64 (12.8%) patients required high flow (non-invasive) oxygen therapy, 1(0.2%) patient required non-invasive ventilation (NIV). Duration of hospital stay was significantly ($p< 0.05$) higher in smokers (12.68±8.672 days) than non-smokers (9.79± 6.007 days). During or soon after discharge, 206 (41.2%) patients could not resumed normal activities of daily life. Only 9 (1.8%) patients died at hospital.

Key words: COVID-19, 7-point ordinal scale, Oxygen, Hospital-stay, Ventilation, Death.

Introduction:

The 'Pandemic' Coronavirus disease 2019 (COVID-19), caused by a previously unknown beta coronavirus, named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first recognized in Wuhan, China, in December 2019[1]. The estimated incubation period for COVID-19 is up to 14 days from the time of exposure, with a median incubation period of 4 to 5 days[2]. Transmission of SARS-CoV-2 occurs primarily through respiratory secretions (droplets produced during coughing and sneezing), and to a lesser extent, contact with contaminated surfaces[3].The spectrum of illness can

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range from asymptomatic infection to severe pneumonia with acute respiratory distress syndrome (ARDS) and death. Presenting signs and symptoms of COVID-19 vary. Most persons experience fever (83–99%), cough (59–82%), fatigue (44–70%), anorexia(40–84%), shortness of breath (31–40%) and myalgias (11-35%). Other non-specific symptoms, such as sore throat, nasal congestion, headache, diarrhea, loss of smell, loss of taste, nausea and vomiting have also been reported[4]. While COVID-19 is primarily a pulmonary disease, emerging data suggest that it also leads to cardiac[5-6], dermatologic[7], hematological[8], hepatic[9], neurological[10-11], renal[12-13], thromboembolic[14] and other complications. This study aimed to evaluate outcomes of patients with COVID-19 who were admitted into Bangabandhu Sheikh Mujib Medical College Hospital, Faridpur, Bangladesh.

Materials and Methods:

This was a prospective observational study included 500 patients with COVID-19 who were confirmed by RT-PCR of nasopharyngeal swab. Data were recorded from direct interview from the hospitalized patients and their relatives. Structured data sheets were filled up in COVID-dedicated ward after admission of patients who fulfilled the selection criteria. Results were recorded in numerical or categorical form as needed. For continuous variables, the mean, standard deviation and test for differences were calculated using t-tests. For categorical and dichotomous variables, differences between groups were evaluated using the chi-square tests. Data analysis was performed using Statistical Package for Social Sciences version 23.

Results:

Mean age of the respondents was 45.70 years and standard deviation was 14.50. Of total 500, majority of the patients (114; 22.8%) belonged to 35-44 years age group, followed by second highest group (112, 22.4%) belonged to 45-54 years (Table I).

Table I: Di stribution of patients according to age group (n=500)

Age group (years)	Frequency (%)
15-24	40 (8%)
25-34	73 (14.6%)
35-44	114 (22.8%)
45-54	112 (22.4%)
55-64	105 (21.0%)
65-74	45 (9.0%)
75-84	10 (2.0%)
85-94	1 (0.2%)

Out of 500 patients, 331 (66.2%) were male and 169 (33.8%) were female. Male to female ratio appeared to be 1.96. Among the respondents, 257 (51.4%) patients were admitted from rural area and 243 (48.6%) from urban area. Most of the patients (322; 64.4%) belonged to 'literate' group. Among the other patients, 90 (18.0%) were illiterate, 59 (11.8%) were graduate and 29 (5.8%) were post-graduate. Majority of the patients (154; 30.8%) were service holder, followed by housewife (101; 20.2%), businessman (91;18.2%), student (39, 7.8%), cultivator (37, 7.4%), retired (30, 6.0%), unemployed (16, 3.2%), labor (10, 2.0%), rickshaw puller (8, 1.6%), fisherman (3, 0.6%) and others (11, 2.2%). Maximum patients (310; 62.0%) had middle socio-economic status. On the other hand, 93 (18.6%) patients had higher and 97 (19.4%) patients had low economic status.

Statistical evaluation also included patients' comorbid conditions and risk factors for severe COVID-19. Overweight or obesity was found in 191 (38.2%) patients, hypertension in 173 (34.6%) patients, diabetes mellitus in 163 (32.6%) patients, smoking in 90 (18.0%) patients, ischemic heart disease (IHD) in 70 (14.0%) patients, asthma in 36 (7.2%) patients, chronic obstructive pulmonary disease (COPD) in 28 (5.6%) patients, chronic kidney disease (CKD) in 18 (3.6%) patients, stroke in 12 (2.4%) patients, malignancy in 6 (1.2%) patients and chronic liver disease (CLD) in 5 (1.0%) patients.

The most common symptoms were fever (437, 87.4%), cough (353, 70.6%), breathlessness (314, 62.8%), fatigue (230, 46.0%), loss of smell (229, 45.8%), anorexia (218, 43.6%) and loss of taste (183, 36.6%). Other features were headache (183, 36.6%), sore throat (175, 35.0%), myalgias (158, 31.6%), nasal congestion (111, 22.2%), nausea (102, 20.4%), diarrhea (92, 18.4%), vomiting (81, 16.2%), DVT (6, 1.2%), pulmonary embolism (3, 0.6%), others (50, 10.0%). According to the classification of severity, 238 (47.6%) patients had mild disease, 124 (24.8%) patients had moderate disease, 130 (26.0%) patients had severe disease and 8 (1.6%) patients developed critical COVID-19.

Of the participants, 371 (74.2%) patients required oxygen (O2) therapy. Low flow oxygen by face mask or nasal prongs was required in 304 (60.8%) patients and 24 (20.3%) patients required high flow (non-invasive) oxygen therapy. Table II displayed distribution of patients according to O2 requirement.

Table II: Distribution of patients according to oxygen requirement (n=500)

Concentration of O2	Frequency (%)
Not required	129 (25.8%)
Low	304 (60.8%)
High	66 (13.2%)
NIV	1 (0.2%)

NIV, Non-invasive ventilation

Duration (days) of oxygen therapy was significantly higher in patients with diabetes, hypertension and IHD and in smokers (Table III).

Two patients (0.40%) were referred to higher center for mechanical ventilation. Mean duration of hospital stay (in days) was significantly ($p<0.05$) higher in smokers (mean: 12.68, SD:8.672) than non-smokers (mean: 9.86, SD: 5.981). Table-IV displayed the duration of hospital-stay among patients with COVID-19.

Of the patients, 30 (6.0%) were transferred to intensive care unit (ICU) for high flow O2 therapy or NIV. Facilities for mechanical ventilation was not available in this hospital. Therefore, 15 (3.0%) patients were referred to higher center for better management. Only 5 (1%) patients required mechanical ventilation. Although

Table III: Analysis of patients according to duration of O2 therapy (n=500)

Variables	Frequency	Mean (days)	SD	Significance
Male	331	4.48	4.988	0.273
Female	169	3.95	5.179	
Diabetic	163	5.90	6.210	0.000
Non-diabetic	337	5.53	4.185	
Hypertensive	173	5.25	5.534	0.02
Normotensive	327	3.80	4.712	
IHD	70	5.51	6.220	0.030
No IHD	430	4.10	4.818	
Asthma	36	5.11	7.293	0.404
No asthma	464	4.24	4.843	
COPD	28	5.68	6.230	0.138
No COPD	472	4.22	4.972	
CKD	18	6.39	8.725	0.074
No CKD	482	4.22	4.862	
Malignancy	6	8.00	8.786	0.703
No malignancy	494	4.26	4.990	
Stroke	12	3.75	3.306	0.071
No stroke	488	4.31	5.091	
Smoker	90	6.10	8.021	0.000
Non-smoker	410	3.90	4.037	
CLD	5	3.60	3.912	0.756
No CLD	495	.31	5.067	

IHD, Ischemic heart disease; COPD, Chronic obstructive pulmonary disease; CKD, Chronic kidney disease; CLD, Chronic liver disease.

Table IV: Analysis of patients according to length of hospital-stay (n=500)

Variables	Frequency	Mean (days)	SD	Significance
Male	331	10.54	6.620	0.407
Female	169	10.02	6.644	
Diabetic	163	10.85	7.664	0.256
Non-diabetic	337	10.13	4.185	
Hypertensive	173	10.86	7.316	0.256
Normotensive	327	10.11	6.227	
IHD	70	10.94	7.130	0.434
No IHD	430	10.27	6.545	
Asthma	36	9.64	7.128	0.494
No asthma	464	10.42	6.591	
COPD	28	10.43	7.084	0.384
No COPD	472	10.31	6.601	
CKD	18	11.83	8.284	0.074
No CKD	482	10.31	6.651	
Malignancy	6	13.33	7.339	0.271
No malignancy	494	10.33	6.617	
Stroke	12	10.50	5.486	0.314
No stroke	488	10.36	6.657	
Smoker	90	12.68	8.672	0.000
Non-smoker	410	9.86	5.981	
CLD	5	10.20	6.301	0.995
No CLD	495	10.37	6.636	

IHD, Ischemic heart disease; COPD, Chronic obstructive pulmonary disease; CKD, Chronic kidney disease; CLD, Chronic liver disease.

patients were discharged when they fulfilled the discharge criteria, 206 (41.2%) did not resumed normal activities of daily life during or soon after discharge from hospital. Out of 500, 9 (1.8%) patients died of COVID-19 during hospital stay.

Discussion:

This prospective observational study included 500 patients with COVID-19. Majority of the admitted patients were middle aged (mean: 45.70 ± 14.50 years). Number of admitted male patients was approximately twice than that of female (male to femaleratio:1.96. Of the total patients, 257 (51.4%) were admitted from rural area and 243 (48.6%) from urban area. The number of illiterate patients was 90 (18.0%). Therefore, most of the patients (410, 82.0%) were literate, graduate and post-graduate. Most of the patients were service holder (154; 30.8%) and businessmen (91;18.2%). Majority of patients had middle (310; 62.0%) and higher 93 (18.6%) socio-economic status.

Among the comorbidities, overweight or obesity in 191 (38.2%), hypertension in 173 (34.6%), diabetes mellitus in 163 (32.6%), smoking in 90 (18.0%), IHD in 70 (14.0%), asthma in 36 (7.2%), COPD in 28 (5.6%), CKD in 18 (3.6%), stroke in 12 (2.4%), malignancy in 6 (1.2%), and CLD in 5 (1.0%) patients were found. This reflects that presence of comorbidities, especially, overweight or obesity, hypertension, diabetes, smoking, IHD and CKD are frequently associated with hospital admission in patients with COVID-19. Two very important factors, obesity and smoking are highly prevalent in admitted patients but these are frequently ignored in community.

Out of total patients, 371 (74.2%) required low flow oxygen by face mask or nasal prongs and 24 (20.3%) patient required high flow (non-invasive) oxygen therapy. This reflects a high demand of oxygen in patients with COVID-19 and ensuring the supply of oxygen, especially high flow oxygen according to need of patients in this pandemic situation may be really challenging in low resource settings. Duration (days) of oxygen therapy was significantly higher in patients with diabetes, hypertension and IHD and in smokers. Out of 500 patients, 15 patients (3%) were referred to higher center. Mean duration of hospital stay (in days) was significantly ($p< 0.05$) higher in smokers. After discharge from hospital, 206 (41.2%) patients did not resumed normal activities of daily life. Ongoing generalized weakness, early fatigue, persistent cough, insomnia and social isolation were the important factors for this.

In this study, 9 (1.8%) patients died of COVID-19 during hospital stay. Among the patients with COVID deaths, 4 patients were male and 5 patients were female. Among the patients who died at hospital, 8 had comorbidities and risk factors for severe COVID-19. Out of these 9 patients, 4 patients were diabetic, 6 patients were hypertensive, 6 patients were smokers, 2 patients were overweight and one patient had malignancy.

Outcomes of the patients varied in different countries. In a study in Italy, 23.1% of patients died. Main causes of death were refractory hypoxia, massive pulmonary thrombosis and multiple organ failure[15]. A study in USA which evaluated 11,721 patients, reported that mortality among hospitalized patients was 21.4% and increased to 70.5% among those on mechanical ventilation. Comorbidities included hypertension (46.7%), diabetes (27.8%), cardiovascular disease (18.6%), obesity (16.1%), and CKD (12.2%). Mechanical ventilation was required for 1,967 patients (16.8%). Male sex, older age, obesity, geographic region, and the presence of chronic kidney disease or preexisting cardiovascular disease were associated with an increased odds of mechanical ventilation[16]. In a study in China, short-term outcomes of hospitalized severe COVID-19 patients were evaluated. In that study, during 28-day follow up of 114 patients, 51 (45%) patients were alive and had been discharged, 39 (34%) had transitioned to non-severe illness, 4 (3%) remained severely ill but did not require a ventilator, i.e., severe status and ventilator free, 11 (10%) were alive but remained ventilated, and nine (8%) died[17]. In a study in Germany, of 10021 hospitalized patients being treated in 920 different hospitals, 1727 (17%) received mechanical ventilation, of whom 422 (24%) were aged 18–59 years, 382 (22%) were aged 60–69 years, 535 (31%) were aged 70–79 years, and 388 (23%) were aged ≥80 years. The most common comorbidities were hypertension, diabetes, cardiac arrhythmia, renal failure, heart failure, and chronic pulmonary disease. In hospital mortality was 22%[18]. Outcomes, especially mortality also varied in patients with different co-morbidities, including diabetes[19], hypertension[20-21], CKD[22], cardiac diseases[23], lung diseases[24], obesity[25], rheumaticdiseases[26] and others.

Conclusion:

COVID-19 is a highly contagious disease. It has been declared as a 'global pandemic' by the World Health Organization. At the beginning of dissemination, the disease created serious fear among the population of Bangladesh. Symptoms, severity and outcomes of the disease vary among the patients. In majority of the cases, the disease appears to be milder. However, severe and critical forms of the disease may be observed in a small proportion of patients, especially in those having comorbidities. Prevention, early detection and rapid management in population having high risk for severe disease should be a prime strategy.

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