Epidemiological and Clinical Characteristics of Covid-19 Cases attended in a Tertiary Hospital in Bangladesh

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Abstract

Introduction: The unprecedented global pandemic that sweeps the planet is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections. To combat this pandemic, the clinical presentation as well as other epidemiological characters need to be understood clearly.

Objective: To describe epidemiological and clinical characteristics, management, and outcomes of Covid-19 patients attended at the Combined Military Hospital (CMH), Dhaka.

Materials and Methods: This cross sectional study was conducted at CMH Dhaka from 15 April 2020 to 31 May 2020 among purposively selected 237 COVID-19 positive patients. Data collection was done by face-to-face interview using semi-structured questionnaire and medical record review.

Results: Highest numbers of the respondents were in the age group of 31-40 years (37.1%) with male predominance (83.1%). About 95.6% were Muslim and 58.6% were educated up to secondary level. About 87.8% had contact with a confirmed case and having 47.7%, 37.2% and 15.1% cardiovascular, endocrine and respiratory co-morbidities respectively. Fever (34.6%) was the common presenting symptoms followed by cough (22.9%), sore throat (10.6%). Radiologically about 7.2% developed bilateral pneumonia and 5.5% having lung involvement in HRCT. Almost half of the patients (48.9%) received Ivermectine and Doxicycline as treatment. Average duration of hospital stay was 14.61 (±4.29) days. About 17.7% showed neutrophilia, 30.0% positive D-dimer test, 22.4% either sepsis or systemic infection in procalcitonin estimation, 28.3% with increased ferritin, 28.7% positive C reactive protein, 21.1% with increased LDH.

Conclusion: The study findings will help the clinicians and medical administrators to understand the magnitude of the disease and take appropriate measures for its prevention.

Introduction

In December, 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, Hubei, China[1] which later on initiated one of the most serious public health crises in the history of humankind[2]. The unprecedented global pandemic that sweeps the planet is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections termed by World Health Organization (WHO) as Coronavirus Disease, COVID-19. This is a single-stranded RNA virus originated from the beta Coronavirus family[3]. As on August 2020, more than 22.5 million cases of COVID-19 have been reported in more than 216 countries and territories, resulting in almost 78549 deaths; approximately 15.08 million people have recovered. The virus was confirmed to have spread to Bangladesh in March 2020. The first three known cases were reported on 8 March 2020 by the country's epidemiology institute, IEDCR[4]. Since then, the pandemic has spread day by day over the whole nation and the number of affected people has been increasing exponentially and till now Bangladesh has reported 279144 confirmed cases among which 160591 has recovered and 3694 died[5]. As a part of the total community, a member of Bangladesh armed forces also suffers from this disease. On 6 April 2020, Bangladesh army revealed its first case of COVID-19 and about 7000 affected individual treated in Combined Military Hospital (CMH) Dhaka[6]. It is well established that about one-fourth of the cases are asymptomatic and about 95% patient cured without any complications[7]. Severe acute respiratory illness with fever and respiratory symptoms, such as cough and shortness of breath, comprise the main clinical presentations[7]. But unusual manifestations, such as patients

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without respiratory symptoms or only very mild symptoms are raising worldwide[8]. From the time of identification to till, multiple clinical symptoms and parameters have been identified by the researchers of various countries and regions regarding the diagnosis and presentations of COVID-19 disease[9]. At the same time a number of research article have been published in various journals elaborating epidemiological and clinical presentations of Covid-19 disease[3]. We aim to describe epidemiological, clinical, laboratory, radiological characteristics, treatment and outcomes of patients confirmed to have 2019-nCoV infection attended at CMH Dhaka.

Material and Methods

This cross sectional study was conducted at CMH Dhaka from 15 April to 31 May 2020. COVID-19 RT-PCR positive 237 purposively selected cases were included with an objective to describe the epidemiological, clinical, laboratory, radiological characteristics, treatment and outcomes of patients. Data were collected from the patient through face to face interview by semi-structured questionnaire and review of medical records. Informed written consent was taken from all the respondents and neither any intervention nor any invasive procedure was undertaken. Prior to the commencement of the study ethical clearance was taken from the competent ethical committee of Combined Military Hospital Dhaka. The questionnaire includes sociodemographic information, contact history, co-morbidities, clinical features, management modalities, complications of the disease and outcome of treatment. Medical record review includes relevant hematological and biochemical investigations. According to the objective of the study data processing data processing and analysis were done by SPSS version 23.

Results

Highest number (37.1%) of the respondents were in the age group of 31-40 years which was followed by <30 years (30.0%). Average age of the respondents was 37 (±10.8) years with age range of 20 to 67 years. Male (83.1%) and Muslim (95.6%) respondents are higher. In regards to the educational qualification, 58.6% were educated up to secondary level. About 84% were married and 84.4% were serving. Majority (57%) of the respondents stayed at hostel/mess and equal (45.1%) numbers were smoker and non-smokers with 9.7% occasional smoker (Table-I).

**Table–I:** Socio-demographic Characteristics of the Covid-19 Positive Patients (n=237)

Characteristics	Frequency	percentage
Age of the Respondents (Years)		
<30	71	30.0
31-40	88	37.1
42-50	42	17.7
>51	36	15.2
Mean (±SD)	37.6 (±10.8)	
Range	20-67	
Sex		
Female	40	16.9
Male	197	83.1
Religion		
Muslim	227	95.8
Hindu	10	4.2
Educational Qualification		
Up to Primary	22	9.3
Up to Secondary (HSC)	139	58.6
Graduation and above	76	32.1
Marital Status		
Married	199	84.0
Single	38	16.0
Profession		
Doctor and hospital staff	2	0.8
Business	22	9.3
Service	200	84.4
Others	13	5.5
Living Status		
Single	7	3.0
Family	95	40.1
Hostel/Mess	135	57.0
Smoking History		
Regular Smoker	107	45.1
Occasional Smoker	23	9.7
Non-smoker	107	45.1

In regards to the contact history, 87.8% had contact with a confirmed case of a Covid-19 positive case and 44.7% respondents had a history of visiting a crowded place in previous 14 days. Very few respondents gave history of contact with a suspected case, contact with a person coming from abroad and recent fever (Table-II).

Table–II: Various Contact History of the Covid-19 Positive Patients (n=237)

|	Frequency	Percentage
Contact with a Confirmed Cases		
Yes	208	87.8
No	29	12.2
Contact with a Suspected Cases		
Yes	9	3.8
No	228	96.2
Contact with a person coming from abroad		
Yes	3	1.3
No	234	98.7
Contact with a person having recent Fever		
Yes	2	0.8
No	235	99.2
Visited a Crowded Place		
Yes	106	44.7
No	131	55.3

Regarding association of chronic diseases, 17.3% of the respondents were suffering from cardiovascular diseases which was followed by Diabetes Mellitus (13.5%) and respiratory diseases (5.5%) (Figure-1).
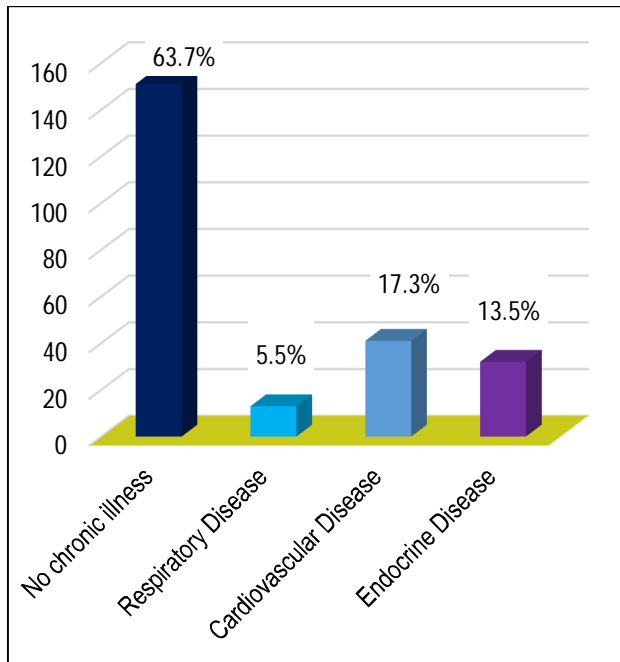
Figure-1: Distribution of Chronic Illness among the respondents (n=237)

Among the respondents Majority presented with fever (34.6%), cough (22.9%), sore throat (10.6%) and generalized weakness (9.2%). Some also presented with headache (8.4%), myalgia

(7.8%), alteration of taste (2.0%) etc. About 1.1% respondents were asymptomatic (Figure-2).
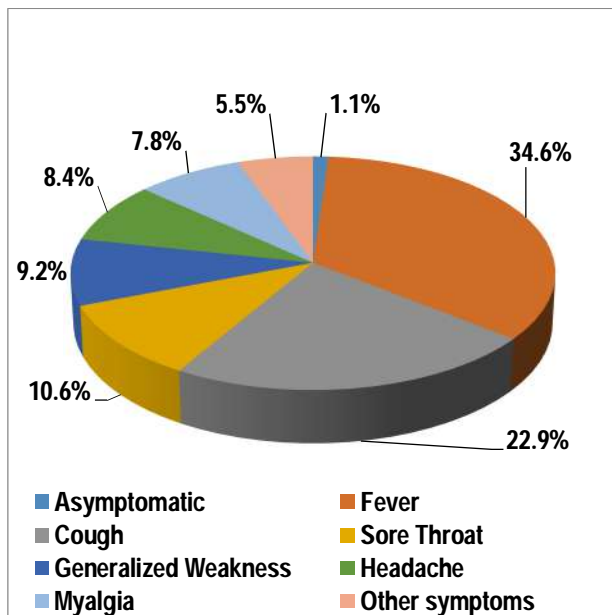
Figure-2: Distribution of presenting symptoms among the respondents (n=237)

X-ray findings revealed that about 7.2% developed bilateral pneumonia and 2.5% developed either unilateral pneumonia or ground glass opacity. Rests of the respondents' clinical course in x-ray were uneventful. In regards to HRCT, about 5.5% respondents showed some lung involvement ranging from <20% to 50-70% (Table-III).

**Table–III: Distribution of radiological findings among the respondents (n=237)**

	Frequency	Percentage
X-Ray Findings		
No abnormality	214	90.3
Bilateral Pneumonia	17	7.2
Unilateral Pneumonia	6	2.5
HRCT Findings		
Not Done	224	94.5
<20% involvement	5	2.1
50-70% involvement	8	3.4

About 48.9% respondents received a combination of Tab. Ivermectine and Cap. Doxicycline which was followed by Cap Doxicycline and Tab Dihydroxicholoroquine (26.6%). Only 2.9% respondents received anti-viral drug Favipiravir along with other common combination medicine. About 1.3% received Inj. Low Molecular Heparin along with other combination drugs (Table-IV).

Table–IV: Distribution of drugs used for the treatment of Covid-19 positive cases (n=237)

	Frequency	Percent
Ivermectine and Doxicycline	116	48.9
Doxicycline and +Hydroxicholoquine	63	26.6
Ivermectine, Doxicycline and azithromycin	13	5.5
Azithromycine and Choloroquine	22	9.3
Ivermectine and Azithromycine	5	2.1
Ivermectine, Doxicycline and Chloroquine	8	3.4

In regards to the hospital stay, almost half (49.4%) of the respondents stayed the hospital from 11-15 days which was followed by 16-20 days (21.1%). Average duration of hospital stay was 14.6(±4.3) days with a range of 7 to 32 days. There was no death case among the respondents. (Figure-3)
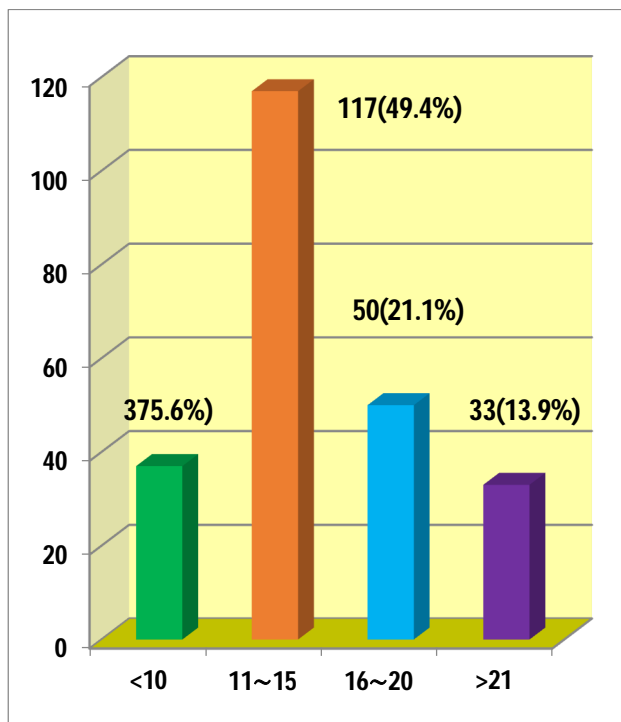
Figure-3: Distribution of duration of hospital stay of the respondent (n=237)

Majority of the respondents showed normal biochemical findings. But about 17.7% showed neutrophilia, 30.0% showed positive D-dimer test, 22.4% showed either sepsis or systemic infection in procalcitonin estimation, 23.2% showed increased ESR, 28.3%

with increased ferritin, 28.7% showed positive C reactive protein, 21.1% with increased LDH estimation (Table-V).

Table–V: Distribution of biochemical findings of the respondents (n=237)

	Frequency	Percent
Blood for Complete Picture		
Within normal limit	158	66.7
Neutrophilia	42	17.7
Neutropenia	2	0.8
Thrombocytopenia + Neutropenia	3	1.3
Lymphocytosis	8	3.4
Both neutrophilia with lymphopenia with thrombocytopenia	1	0.4
Neutropenia + Lymphocytosis	4	1.7
Neutrophilia+Thrombocytopenia	7	3.0
Neutrophilia+Anemia	12	5.1
D-Dimer		
Normal	166	70.0
Positive	71	30.0
Procalcitonin		
<0.05ng/ml: Healthy Individual	184	77.6
0.5-2.0ng/ml: Systemic Infection	13	5.5
2.0-10.0ng/ml: Sepsis	40	16.9
Serum ferritin		
Within Normal Limit	170	71.7
Increased	67	28.3
C reactive protein		
Normal	169	71.3
Positive	68	28.7
Blood biochemistry ALT		
Normal	207	87.3
Increased	30	12.7
Blood biochemistry AST		
Normal	208	87.8
Increased	29	12.2
Blood biochemistry LDH		
Normal	187	78.9
Increased	50	21.1

Discussion

This cross sectional study was conducted with an objective to assess the epidemiological and clinical presentation of COVID 19 patients. In this study the mean age (±SD) of the respondents was 37 (±10.8) years which is may be due the selection of study respondents (armed forces personnel). Similar finding revealed from the study conducted in Bangladesh by Morshed MS et al, Mawla SGM et al and Chowdhury AT et al[2,3,9]. This finding also matched with the finding of the study conducted in China by Guan WJ et al (median age: 47 years; 41.9% female)[7], in India by Gupta N et al (mean age 40.3 years, 66.7% male)[10]. But it is not consistent with the study conducted by Huang C et al who found in their study that the mean age was 55.5 (± 13.1 years) which may be due to the regional variation and types of respondents they enrolled in their study[1]. But studies from America[11] (median age, 63 years) and Europe[12] (Median age, 67.5 years) showed higher age of patients but same male preponderance. We found that 83.1% of the respondents were male and rest are female which is similar to a study conducted by Huang C et al., Morshed MS et al., Mawla SGM et al., Guan WJ et al., Chowdhury AT et al and Gupta N et al where the majority of the respondents were male[1,2,3,7,8,9]. In regards to the educational qualification, it was revealed that 58.6% of the patients were educated up to secondary level which may be due to the service requirement for the armed forces.

In the current study about 87.8% had contact with a confirmed case of a Covid-19 and 44.7% respondents had a history of visiting a crowded place in previous 14 days. Mawla SGM et al revealed in their study that 60% of patients had positive contact history that highlights the importance of preventive and containment processes of pandemic including distancing, hand washing and proper usage of mask etc[3]. This finding also consistent with the study conducted by Nanshan Chen et al[1] who revealed that almost all the positive Covid-19 patients had a history of exposure to the Hunan seafood market. Similar findings also revealed from the study conducted by Guan WJ et al[7] Chang D et al also revealed the same findings where almost all the patients had some exposure either directly to the Wuhan sea food market or residents of Wuhan or having a history of visiting the city of Wuhan[13]. Very few respondents gave history of contact with a suspected case, contact with a person coming from abroad and recent fever.

The present study revealed that about 47.7% suffering from cardiovascular diseases like hypertension, Ischemic Heart Diseases which was followed by endocrine disease like Diabetes Mellitus (37.2%) and 15.1% was suffering from respiratory disease. This finding matched with the study findings of Morshed MS et al[2]. In their study conducted by Gao M et al revealed that 25.7% of the respondents present with a history of cardiovascular disease and 22.9% with digestive diseases[14]. Similar findings

also revealed by Wang D et al[15]. Yang J et al revealed that hypertension (21%) and diabetes (16%) was the most common comorbidities which is supportive finding with this study[16].

Among the respondents, majority presented with fever (34.6%), cough (22.9%), sore throat (10.6%), generalized weakness (9.2%). Other symptoms were headache (8.4%), myalgia (7.8%), alteration of taste (2.0%) etc. About 1.1% respondents presented with no symptoms. These findings matched with the study conducted by Morshed MS et al, Mawla SGM et al, Chowdhury AT et al, Guan WJ et al, Gupta N et al and Huang C et al. All the study revealed that fever was the most common presenting symptoms which was followed by cough, weakness, head ache, sore throat, loss of appetite, difficulty in breathing, altered sensation of taste or smell and body ache etc. Similarly, in a meta-analysis from China, most prevalent symptoms they found were fever (80.4%), cough (63.1%) and fatigue (46%)[17,18]. In contrast, one study from Europe on mild to moderate patients reported that headache (70.3%), loss of smell (70.2%), nasal obstruction (67.8%) were the most common symptoms; fever was reported by only 45.4% of patients. This study showed about 5.5% patient presented with loss of smell and about 4.5% with loss of taste sensation which is not consistent with the findings of a study conducted by Lechien JR et al where they found that 39% of mild cases, 40% of moderate cases and 12.5% of severe cases reported the altered sensation of taste or smell. While olfactory and gustatory dysfunctions were prevalent symptoms in European patients, they were only rarely reported in Chinese patients[19,20].

X-ray findings of this study revealed, 7.2% developed bilateral pneumonia, 2.5% developed either unilateral pneumonia or ground glass opacity and rest of the respondents' x-ray findings were uneventful; whereas about 5.5% respondents showed some degree of lung involvement in terms of ground glass opacity or unilateral/bilateral patchy opacity ranging from <20% to 50-70% in HRCT radiography. The radiological findings were not consistent with the findings from the study conducted by Chen N et al who found 25% developed unilateral pneumonia, 75% developed bilateral pneumonia and 14% developed multiple mottling and ground-glass opacity[21]. These difference may be due to inclusion of only mild to moderate cases in this study whose progression of disease was almost uneventful. The radiological findings were also not consistent with the study conducted by Guan WJ et al[22].

About 48.9% respondents received a combination of Tab. Ivermectine and Cap. Doxicycline which was followed by Cap Doxicycline and Tab Dihydroxicholoroquine (26.6%). Other combination treatment the respondents were received includes Tab. Ivermectine, Cap. Doxicycline and Tab. Azythromycine (5.5%), Tab. Azythromycine and Tab. Dihydroxycholoroquine

(9.3%), Tab. Ivermectine and Tab. Azythromycine (2.1%), Tab. Ivermectine, Cap. Doxicycline and Tab. Dihydroxycholoroquine (3.4%) etc. Only 2.9% respondents received anti-viral drug Favipiravir along with other common combination medicine. About 1.3% received Inj. Low Molecular Heparin along with other combination drugs. As there is no established and proven medicine against Covid-19 infection, so no such literature in regards to the treatment applied to the study respondents were found, but Kakodkar et al. discussed about the treatment where they showed that the management is predominantly supportive amidst the absence of validated antiviral drugs. They also mentioned that the most primary symptoms managed in COVID-19 are fever and non-productive cough, therefore the first-line antipyretic agent is Paracetamol and antitussive of choice is guaifenesin. In their study, they also discussed about the role of vitamin C and D along with few anti-viral drugs like Remdesivir, Lopinavir, Ritonavir, Umifenovir, Chloroquine, Systemic Corticosteroids, antipyretics etc[18]. Most of our patients underwent treatments presumed to have activity against SARS-CoV-2. The indication for treatment has changed during the course of the pandemic but has always been based on the guideline by the Director General of Health Services (DGHS) of Bangladesh and Director General Medical Services (DGMS). We have included in this article the use of treatments with potentially antiviral/supportive effects available in the hospital but that have not proven clinically effective by appropriate research (hydroxychloroquine, azithromycin, Doxicycline, Ivermectine, Remmdesivir and lopinavir/ritonavir etc.).

About 49.4% respondents of the present study stayed in the hospital from 11-15 days which was followed by 16-20 days (21.1%). Average duration of hospital stay was 14.6 days with standard deviation (SD) of 4.3 days. This was consistent with the findings of the study conducted by Chen J et al. (median period was 11 days)[23].

Majority of the respondents showed normal biochemical findings. But about 17.7% showed neutrophilia, 30% positive D-dimer test, 22.4% either sepsis or systemic infection in procalcitonin estimation, 23.2% increased ESR, 28.3% with increased ferritin, 28.7% positive C reactive protein (CRP) and 21.1% showed increased LDH. All these findings were consistent with the study conducted by Chowdhury AT et al. where the revealed an increased level of ESR, CRP, SGPT, S. Ferritin, Prothrombin time, and D-Dimer. However, the level of Hemoglobin and RBC were decreased and also revealed leucocytosis, neutrophilia, and lymphocytopenia[9] whereas Chen J et al[23] revealed leukopenia and lymphopenia in 28.9% and 47.4% of the patients respectively. Erythrocyte sedimentation rate (ESR) was increased in 85.5% of the patients, while CRP was elevated in more than half of the patients. Elevated levels of alanine aminotransferase, aspartate aminotransferase were less common as well as decreased level of the estimated glomerular filtration rate. CD4 T cells count was decreased in 45.4% of the patients while CD4/CD8 ratio was normal in 92.8% of the patients[23].

Conclusion

In this study, maximum clinical presentation, laboratory and radiological findings, treatment and clinical outcome coincides with other research articles indicating the similarities with the ongoing pandemic. It will certainly help the clinicians and medical administrators in the armed forces to understand the magnitude of the disease course and take appropriate measures for its prevention and management. Because of small sample size and exclusion of critical cases, our study findings may not be generalized in the context of Bangladesh.

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