Original Article

Clinicopathologic Features and Outcome of COVID-19 Patients Attended at a Secondary Hospital in Bangladesh during the Pandemic

Syed Mohammad Shaifuddin[1], Md Abdul Wahab[2], Farzana Zafreen[3], Jaida Jalal Sarker[4]

Abstract

Background: *Coronavirus Disease 2019 (COVID-19) is an acute respiratory disease that can present varieties of clinical and pathologic manifestation. Sometimes it present with severe manifestation which ultimately lead to respiratory failure and death. COVID-19 patients with other comorbidities may develop a life-threatening situation.* ***Objective:*** *To describe the clinicopathologic features and outcome of COVID-19 patients admitted in Combined Military Hospital (CMH) Rangpur, Bangladesh.* ***Materials and method:*** *This cross-sectional study was conducted at CMH Rangpur, Bangladesh, from 1 May 2021 to 30 August 2021 among purposively selected 416 cases of COVID-19 positive patients. Data were collected from the medical records of the hospital admitted patients in a structured case report form.* ***Results:*** *Highest numbers of the respondents were in the age group of 31-50 years (49.03%) with male predominance (72.28%). About 89% were Muslim and 54.81% were educated up to higher secondary level. Fever (90.86%) was the common presenting symptoms followed by cough (73.55%), sore throat (30.28%). About 24.51%, 23.07%, 11.05% had hypertension, diabetes mellitus and respiratory comorbidities respectively. Lymphopenia (75.24%) and elevated C-Reactive Protein (54.08%) were observed in most of the cases. Only 8.17% patients had critical illness that needed intensive care unit admission. Majority (91.82%) fully recovered from the illness while 1.92% expired.* ***Conclusions:*** *The most commonly reported symptom was fever (90.86%) among all the COVID-19 positive patients. Majority (62.25%) of the patients belonged to mild cases. Overall mortality was 1.92%. In most cases the clinical presentation is that of a respiratory infection with symptom severity ranging from a mild influenza like illness.*

Keywords: *COVID-19; Acute Respiratory Distress Syndrome; Pandemic; CMH Rangpur.*

Delta Med Col J. Jan 2021;9(1):3-8

Introduction

Coronavirus disease (COVID-19) is a severe acute respiratory infectious disease caused by a newly discovered coronavirus known as SARS-CoV-2. COVID-19 first appeared in Hubei province of Wuhan, China, as a cluster of pneumonia cases of unknown origin.[1,2] World Health Organization (WHO) declared COVID-19 as global pandemic on 11th March 2020. In Bangladesh, the first case was detected on 8th March, 2020. Heath bulletin of Bangladesh reported total of about 1.5 million

Author information

1. Classified Specialist in Medicine, Combined Military Hospital, Rangpur, Bangladesh.
2. Classified Specialist in Pathology CMH Cumilla and Professor of Biochemistry, Army Medical College Cumilla, Bangladesh.
3. Professor & Head, Department of Community Medicine, Medical College for Women & Hospital, Uttara, Dhaka, Bangladesh.
4. Medical Officer, Civil Surgeon's Office, Rangpur, Bangladesh.

Correspondence: Lt Col Syed Mohammad Shaifuddin. e-mail: shaifs75@gmail.com

confirmed cases and 28,098 deaths from COVID-19 by 8th January, 2022.[3] Confirmed case is defined as a person with laboratory confirmation by Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) of SARS-COV-2, irrespective of clinical signs and symptoms.[4] Studies from different countries across the globe have evidenced that the clinical spectra of COVID-19 ranges from mild to moderate symptoms of cough, sore throat, fever, headache, rhinorrhea, vomiting, diarrhea, and shortness of breath to complex signs and symptoms of severe pneumonia, acute respiratory distress syndrome, septic shock and/or multiple organ failure.[5-8] COVID-19 is a novel disease which has a viral origin and it mimics other viral diseases. Although SARS-COV-2 has a tropism for Angiotensin Converting Enzyme 2 (ACE2) - expressing epithelial cells of the respiratory tract, people with severe COVID-19 have symptoms of systemic hyperinflammation and elevated levels of several interleukins and cytokines indicative of cytokine release syndrome (CRS) suggest an underlying immunopathology.[2] Additionally, people with COVID-19 and acute respiratory distress syndrome (ARDS) have classical serum biomarkers of CRS, including elevated C-reactive protein (CRP), lactate dehydrogenase (LDH), D-dimer, and ferritin.[10] A high incidence of thrombosis and venous thromboembolism have been found in people transferred to Intensive Care Unit (ICU) with COVID-19 infections, and may be related to poor prognosis.[11] Blood vessel dysfunction and clot formation (as suggested by high D-dimer levels) are thought to play a significant role in mortality, incidences of clots leading to pulmonary embolisms, and ischaemic stroke have been noted as complications leading to death in SARS-COV-2.[12] Comorbidities lead COVID-19 into a vicious infectious cycle and are substantially associated with significant morbidity and mortality. The main objective of this study is to describe the clinical characteristics and outcomes like mortality, need for mechanical ventilation, and ICU admission and explores the comorbidities associated with severe disease outcomes in COVID-19 patients.

This cross-sectional study was conducted by medical record review at Combined Military Hospital (CMH) Rangpur from 1 May 2021 to 31 August 2021 among purposively selected 416 confirm COVID-19 cases of either sex with an objective to describe the clinicopathologic characteristics. A confirmed case of COVID-19 was defined by a positive result on a Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) assay using a nasopharyngeal and throat swab specimen. Data were collected from the medical records of the hospital admitted patients in a structured case report form. Prior to the commencement of the study ethical clearance was taken from the competent ethical committee of Combined Military Hospital Rangpur. For the purpose of the study patients with no signs of pneumonia on imaging were categorized as mild case, patients having symptoms of fever, respiratory tract infection with pneumonic manifestation as moderate, patients with respiratory distress (>30 breath/min), oxygen saturation <93% at rest, imaging lesions with >50% lung involvement and several comorbidities as severe and patients with occurrence of respiratory failure requiring mechanical ventilation with presence of shock and other organ failure requires monitoring and treatment in Intensive Care Unit (ICU) were categorized as critical case. The questionnaire includes sociodemographic information, comorbidities, clinical features and outcome of the respondents. According to the objective of the study data processing and analysis were done by SPSS version 23.

Results

Almost half (49.03%) of the respondents were in the age group of 31-50 years which was followed by 51-70 years (27.40%). Average age of the respondents was 43.20 (±5.7) years. Male (72.28%) and Muslim (88.94%) respondent were clearly higher. In regards to the educational qualification, 54.81% were educated up to higher secondary level. About 93.27% were married and 71.63% were serving respondents. Majority

(51.68%) of the respondents stayed at mess/sainik line and only 19.95% were smoker. (Table I)

Table I: Sociodemographic characteristics of the COVID-19 positive patients (N=416)

Characteristics	Frequency (%)	Characteristics	Frequency (%)
Age of the Respondents (Years)		**Marital Status**	
<30	52 (12.5)	Married	388 (93.27)
31-50	204 (49.03)	Single	28 (6.73)
51-70	114 (27.40)	**Profession**	
>70	46 (11.05)	House wife	78 (18.75)
Mean (± SD)	43.2 (±5.7)	Service	298 (71.63)
Sex		Others	40 (9.62)
Female	107 (27.72)	**Living Status**	
Male	309 (72.28)	With Family	201 (48.31)
Religion		Mess/Sainik line	215 (51.68)
Muslim	370 (88.94)		
Hindu	46 (11.06)	**Smoking History**	
Educational Qualification		Regular Smoker	83 (19.95)
Up to SSC	120 (28.85)	Ex-Smoker	23 (5.53)
Up to HSC	228 (54.81)	Non-smoker	310 (74.52)
Graduation and above	68 (16.35)		

Majority of the respondents, presented with fever (90.86%), cough (73.55%), sore throat (30.28%), headache (26.92%) and runny nose (26.92%). Other symptom presentations were myalgia (7.8%), alteration of taste (2.0%), etc. About 1.1% respondents presented with no symptoms. (Table II)

Table II: Distribution of cases according to clinical manifestations* (N=416)

Clinical manifestation	Frequency	Percentage
Fever	378	90.86%
Cough	306	73.55%
Sore Throat	126	30.28%
Headache	112	26.92%
Runny Nose	112	26.92%
Respiratory Distress	93	22.35%
Fatigue	81	19.47%
Diarrhea	63	15.14%
Anosmia	42	10.09%

*Multiple response

In regards to the chronic diseases among the respondents, 24.51% had been suffering from hypertension which was followed by endocrine disease like Diabetes Mellitus (23.07%) and 11.05% was suffering from respiratory disease. (Table III)

Table III: List of Comorbidities* (N=416)

List of Comorbidities	Frequency	Percentage
Hypertension	102	24.51%
Diabetes	96	23.07%
Chronic Lung Diseases	46	11.05%
Ischemic Heart Diseases	29	6.97%
Chronic Kidney Disease	25	6.00%
Cerebrovascular Disease	18	4.32%
Malignancy	04	0.96%
Pregnancy	07	1.68%

*Multiple response

Among the respondents, majority (62.25%) were mild case which was followed by moderate case (16.58%). Only 8.17% were critical in nature. (Table IV)

Table IV: Abnormal laboratory and imaging finding of the patients (N=416)

Parameter	Frequency	Percentage
Lymphopenia	313	75.24%
Elevated CRP	225	54.08%
Elevated ferritin	160	38.46%
Positive D-Dimer	116	27.88%
High ALT	162	38.94%
Elevated serum LDH	134	32.21%
Chest x-ray- bilateral pulmonary shadow	88	21.15%
Abnormal ECG changes	46	11.05%

Most common laboratory abnormalities are lymphopenia (75.24%), elevated CRP (54.08%), elevated serum ferritin (38.46%), positive D-Dimer (27.88%), high ALT (38.94%) and elevated serum LDH (32.21%). (Table V)

Table V: Severity of cases of COVID-19 (N=416)

Severity of cases	Frequency	Percentage
Mild Cases	259	62.25%
Moderate Cases	69	16.58%
Severe cases	54	12.98%
Critical Cases	34	8.17%

In regards to the distribution of the patients after admission, 78.84% were in the general ward and only 8.17% of the patients need ICU admission. (Table VI)

Table VI: Distribution of patients after admission (N=416)

Distribution of patient after admission	Frequency	Percentage
General Ward	328	78.84%
HDU	54	12.98%
ICU	34	8.17%

In regards to the clinical outcome only 1.92% patients were expired and 8.17% need ICU admission. (Table VII)

Table VII: Clinical outcome of respondents (N=416)

Outcome	Frequency	Percentage
Recovered uneventfully	382	91.82%
Needed ICU* support	34	8.17%
Expired	08	1.92%

*ICU - Intensive Care Unit

Discussion

Present study demonstrates that maximum number of patients (49.03%) was between 31-50 years age group, mean age of the patient was 43.2±5.7 years and male and female ratio was 2.88:1. Result of present study was consistent with the results of another study in Bangladesh where mean age was 35.7 years. Predominant responders were from 31-50 age group, who consisted of 50% of their study population.[13] In our study fever and cough was commonest presentation that is 90.86% and 73.55% of patients respectively. Other manifestations were diarrhea (15.14%), dyspnea (22.35%) and headache (23.92%). A systematic review by Rodriguez-Morales et al. on 656 cases published in January and February, 2021 reported fever in 88.7%, cough in 57.6%, dyspnoea in 45.6%, myalgia in 29.4%, sore throat in 11.0%, headache in 8.0%, and diarrhea in 6.1%.[12] In this study comorbidities were diabetes (23.07%), hypertension (24.51%), CLD (11.05%) and IHD (6.97%), 7(1.68%) patients were in pregnancy. Ahmed et al. found 21 patients having multiple co-morbidities which included diabetes, hypertension, chronic kidney disease, and ischaemic heart disease.[14] Aggarwal et al. reported that 6(38%) patients had chronic kidney disease, 2(13%) patients had a history of chronic obstructive pulmonary disease (COPD). For cardiovascular comorbidities, 9(56.3%) had a history of hypertension, 3(19%) had a history of coronary artery disease, 3(19%) had a history of congestive heart failure, and 2(13%) had a history of stroke.[15] Another meta-analysis of the published global literature also assessed the interaction of patients with comorbidities with COVID-19 severity and mortality. It identified that COPD, CAD, type 2 DM, malignancy and hypertension were most significantly associated with COVID-19 severity. In our study most common laboratory abnormalities are lymphopenia (75.24%), elevated CRP (54.08%), elevated serum ferritin (38.46%), positive D-Dimer (27.88%), high ALT (38.94%) and elevated serum LDH (32.21%) that coincides with other studies. Study carried out by Ali showed that elevated CRP was observed in 86% of severe cases.[16] Patient with severe disease are more likely to have elevated CRP. In a study conducted by He et al., D-Dimer was found positive in 37.17% cases which is also consistent with our study.[17] Clinical outcome analysis revealed that, 382(91.82%) patients were recovered uneventfully and 34(8.17%) patients developed different complications and required high flow nasal cannula (HFNC) and noninvasive ventilation (NIV). In this study mortality rate was 1.92% for COVID-19 patients. Aggarwal et al. reported that among 16 patients, 11(68.75%) patients were discharged in a stable condition from the hospital. Total 8(50%) patients, needed ICU admission, five of whom necessitating intubation and mechanical ventilation. Three patients (19%) died from the illness.[15] SARS-COV-2 affected globally a large population with pneumonia like symptoms. Patients with comorbid illness are at utmost risk of infection. These individuals must undertake vigilant preventive measures to protect themselves from infection hence, and should be prioritized for vaccination against SARS-COV-2 infection.

Conclusion

COVID-19 is global burden which is a potentially severe acute respiratory infection caused by a novel evolving severe acute respiratory syndrome corona virus 2 (SARS-COV-2). In most cases the clinical presentation is that of a fever and respiratory infection with a symptom severity ranging from a mild influenza like illness, to a severe viral pneumonia leading to acute respiratory distress syndrome that is potentially fatal. The most commonly reported symptoms in present study were fever (90.86%) and cough (73.55%) among all the COVID-19 positive patients. Lymphopenia (75.24%) and elevated C reactive protein (54.08%) were present in most of the cases. Majority (62.25%) of the patients belonged to mild cases. ICU support needed for 8.17% patients. Overall mortality was 1.92%. This study will help for further evaluation with larger study on clinical profile of COVID-19 patient for its prevention and management in Bangladesh.

References

1. Clinical Profile of Covid-19 Infected Patients Admitted in a Tertiary Care Hospital in North India -PubMed [Internet]. [cited 2020 Apr 28]. Available from: https://pubmed.ncbi.nlm.nih.gov/32610859/
2. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical Features of Patients Infected with 2019 Novel Corona Virus in Wuhan, China. Lancet. 2020;395(10223):497-506.
3. Coronavirus disease (COVID-19) Situation Report – 162, World Health Organization (Covid-19), 30th June 2020 Data as of 10 AM CEST. 30 June 2020. Reporting Country/ Territory/Area Total confirmed cases. Total confirmed new cases. Total deaths. Available from: https://www.who.int/bangladesh/emergencies/coronavirusdisease-(covid-19)-update/coronavirusdisease-(covid2019)-bangladesh-situation-reports.
4. National Guidelines on Clinical Management of Coronavirus Disease 2019 (COVID-19) 6th version 18th May 2020. p.11-17.
5. Government of Kerala COVID 19 Clinical Management Report.
6. Argenzian MG, Bruc SL, Slate CL, Tia JR, Baldwi MR, Barr RG, et al. Characterization and Clinical Course of 1000 Patients with Coronavirus Disease 2019 in New York: Retrospective Case Series. BMJ. 2020;369.
7. Rivera-Izquierdo MI, del Carmen Valero-Ubierna M, del Amo JLR, Fernández-García MÁ, Martínez-Diz S, Tahery-Mahmoud A, et al. Sociodemographic, Clinical and Laboratory Factors on Admission Associated with COVID-19 Mortality in Hospitalized Patients: A Retrospective Observational Study. PLoS One. 2020;15(6):e 0235107. doi:org/10.1371/journal. pone.0235107
8. Singh SB, Joice S, Nishima PR, Ananya SW. Clinicosocial Profile of Covid 19 Positive Patients Admitted in A Tertiary Care Centre in South Kerala, India. IOSR-JDMS. 2021;20(05):23-28.
9. Zhang C, Wu Z, Li JW, Zhao H, Wang GQ. The cytokine release syndrome (CRS) of severe COVID-19 and Interleukin-6 receptor (IL-6R) antagonist Tocilizumab may be the key to reduce the mortality. International Journal of Antimicrobial Agents. 2020;55(5):105954. doi:10.1016/j.ijantimicag.2020.105954.
10. Wadman M, Couzin-Frankel J, Kaiser J, Matacic C. How Does Corona Virus Kill? Clinicians Trace a Ferocious Rampage through the Body, from Brain to Toes. 2020. doi:10.1126/science. abc3208.
11. Disease Control Division, Directorate General of Health Services, Ministry of Health & Family Welfare. National Guidelines on Clinical Management of COVID-19, Version 8.0, 5 November 2020.
12. Rodriguez-Morales AJ, Cardona-Ospina JA, Gutiérrez-Ocampo E, Penna RV, Holguin-Rivera Y, Escalera Antezana JP, et al. Clinical, Laboratory and Imaging Features of COVID-19: A Systematic Review and meta-analysis. Travel Med Infect Dis. 2020;34:101623.doi:10.1016/j.tmaid.2020.101623 [Epub ahead of print]

13. Islam MR, Bashar KA, Matin S, Tanveer T, Rahman A, Mowla SGM, et al. Sociodemography and Clinical Profile of COVID-19 Positive Physicians at a Tertiary Level Hospital, Dhaka. Bangladesh Coll Phys Surg. 2020; 38:56-60.

14. Ahmed NU, Islam MA, Kabir MA, Rahman MH, Sadat SMA. Clinico-Pathological Findings of Bangladeshi Covid 19 Patients with Their Clinical Outcome: Study of a Cohort of 201 Cases. J Bangladesh Coll Phys Surg. 2020;38:37-42.

15. Aggarwal S, Garcia-Telles N, Aggarwal G, Lavie C, Lippi G, Henry BM. Clinical Features, Laboratory Characteristics, and Outcomes of Patients Hospitalized with Coronavirus Disease 2019 (COVID-19): Early Report from the United States, Diagnosis, 2020;7(2):91-96.

16. Ali N Elevated Level of C-Reactive Protein may be an Early Marker to Predict Risk of Severity of COVID-19. J Med Virol. 2020;92:10.1002.

17. He X, Yao F, Chen J, Wang Y, Fang X, Lin X, et al. The Poor Prognosis and Influencing Factors of High D-Dimer Levels for COVID-19 Patients. Scientific Reports 11, 1830; 2021.