Analysis of clinical features of COVID-19 patients admitted in a tertiary care hospital in Chattogram, Bangladesh

Name: Mohammad Saiful Islam
MPH Thesis
One Health Institute
Roll No. 0119/04
Registration no:731
Session: 2019-2020

The thesis submitted is in the partial fulfillment of the requirements for the degree of MPH (One Health)

ONE Health Institute
Chattogram Veterinary and Animal Sciences University
Chattogram-4225, Bangladesh

I hereby declare that I am the sole author of this thesis. I also authorize the Chattogram Veterinary and Animal Sciences University (CVASU) to lend this thesis to other institutions or individuals for the purpose of scholarly research. I further authorize the CVASU to reproduce the thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research. I, the undersigned, and author of this work, declare that the **electronic copy** of this thesis has been provided to the CVASU Library, is an accurate copy of the print thesis submitted, within the limits of the technology available.

Mohammad Saiful Islam
April 2022

Analysis of clinical features of COVID-19 patients admitted in a tertiary care hospital in Chattogram, Bangladesh

Name: Mohammad Saiful Islam

Roll no: 0119/04

Registration no.: 731

Session: 2019-2020

This is to certify that we have examined the above MPH (One Health) thesis and have found that it is complete and satisfactory in all respects, and all revisions required by the thesis examination committee have been made.

———————————————————   ———————————————————

Professor Dr. A.M.A.M Zonaed Siddiki   **Dr. Adnan Walid**
Supervisor   **Co-Supervisor**

Prof. Sharmin Chowdhury, PhD
Chairman of the Examination Committee
One Health Institute
Chattogram Veterinary and Animal Sciences University
Chattogram-4225, Bangladesh

January 2021

Acknowledgements

_____

Mohammad Saiful Islam
April 2022

Table of Contents

List of Tables

List of Figures

List of Abbreviations

Abbreviation	Elaboration
CI	Confidence Interval
RT-PCR	Reverse Transcription Polymerase Chain Reaction
SpO$_2$	Oxygen Saturation
GCS	Glasgow Coma Scale
ESR	Erythrocyte Sedimentation Rate
WBC	White Blood Cells
PT	Prothrombin Time
SGPT/ALT	Serum Glutamic-Pyruvic Transaminase/Alanine Aminotransferase
SGOT/AST	Serum Glutamic-Oxaloacetic Transaminase/ Aspartate Aminotransferase
CS	Cytokine Storm
IL	Interleukin
FGF	Fibroblast Growth Factors
G-CSF	Granulocyte Colony Stimulating Factor
GM-CSF	Granulocyte Macrophage Colony-Stimulating Factor
IFN-γ	Interferon Gamma
MCP	Monocyte Chemoattractant Protein
MIP	Macrophage Inflammatory Proteins
PDGF	Platelet-Derived Growth Factor
TNF	Tumor Necrosis Factor
VEGF	Vascular Endothelial Growth Factor
CRP	C- Reactive Protein
NT Pro BNP	N-Terminal Pro B-Type Natriuretic Peptide
HFNC	High-Flow Nasal Cannula
CPAP	Continuous Positive Airway Pressure
BiPAP	Bi-level Positive Airway Pressure
DORB	Discharge On Risk Bond
COPD	Chronic Obstructive Pulmonary Disease
ARDS	Acute Respiratory Distress Syndrome

Abstract

The coronavirus disease (COVID-19) caused by the RNA virus SARS-CoV-2 has appeared as a devastating pandemic in recent times. Although many studies have been conducted on the clinical features and the complications caused by the disease, the changing variants of the virus has resulted in the disease showing a diversity in illness presentation, from asymptomatic cases to critical illness followed by death. In Bangladesh, few studies are available on the presenting features of patients requiring hospital admissions. Present study was undertaken to confirm the findings stated in previous studies and to report any new observations that were not mentioned before or may have gone unnoticed. The study was conducted at the in-patient department of a COVID-19 dedicated hospital in Chattogram metropolitan area. With necessary consent, a total of 306 patients were followed from the time of admission until the time of discharge from the hospital's COVID unit. Among the

admitted adult cases, majority of them were between the 35 to 55 years old age group and the male:female ratio was 7.74:1. Common risk factors observed were hypertension (56.2%), diabetes (45.4%), smoking (33.3%), obesity (29.1%), bronchial asthma (14.4%), chronic kidney disease (10.1%), chronic heart disease (5.9%), cerebrovascular disease (4.9%), chronic obstructive pulmonary disease (3.9%), history of suppressive therapy (2.6%), chronic liver disease (1.6%) and history of surgery (0.7%) and chemotherapy (0.7%). Common symptoms were fever (99.3%), cough (91.8%), fatigue (81.7%), altered smell (81%), altered taste (71.6%), anorexia (56.5%), dyspnea (48.4%), headache (48.4%), generalized body ache (28.4%), sore throat (25.5%), conjunctivitis (23.5%), diarrhea (15%), nasal congestion (14.1%), vomiting (13.1%), and dizziness (11.1%). Common signs were wheezing (31.4%), crackles (21.9%), bronchial breath sounds (20.3%) and cyanosis (2%). In case of clinical management, 119 (38.9%) patients received IV fluids, 47 (15.4%) patients were given medications to support blood pressure and 2 (0.7%) patients had undergone dialysis. For oxygen maintenance, 181 (59.2%) patients received oxygen through a nasal cannula, 42 (13.7%) were given oxygen through High Flow Nasal Cannula, 33 (10.8%) patients were managed with Continuous positive airway pressure, 16 (5.2%) with Bi-Level Positive Airway Pressure and 6 (2%) were given mechanical ventilation. The most common drugs used for COVID-19 treatment were enoxaparin (76.8%), followed by the dexamethasone (41.5%), Remdesivir (17%), methylprednisolone (7.5%),

Ivermectin (1.3%) and Favipiravir (0.7%). As for patient outcome 88.9% recovered, 5.9% took Discharge On Risk Bond, 2 % were referred to other hospitals and 3.3% died. On comparing the different parameters between the patients who expired as compared to survived, significant differences were found in many parameters. For demographic profile, the age (p=0.007) and number of affected family members (p=0.046) were significantly associated with adverse patient outcome. Patients with a history of diabetes (p<0.001), hypertension (p= 0.003), bronchial asthma (p= 0.041) and use of suppressive therapy (p=0.024) had a significant association with adverse patient outcome. In case of symptoms, a significant difference was found between mean duration of symptoms for the variables fever (p<0.001), cough (p=0.011), dyspnea (p=0.031), altered taste (p=0.001), fatigue (p=0.009), confusion (0.045) and generalized body ache (p<0.001). In case of signs, a significant difference was observed between mean duration of signs such as crackles (p=0.04), wheezing (p<0.001) and bronchial breath sounds (p=0.033). Patients who expired had a significantly lower SPO_2 on admission (p=0.004), lower SPO_2 after oxygen therapy (p<0.001), lower Glasgow Coma Scale (p=0.018), lower systolic (p<0.001) and diastolic blood pressure (p<0.001), higher heart rate (p=0.005) and higher respiratory rate (p=0.008). For serum electrolytes, levels of sodium (p=0.002), potassium (p=0.011) and bicarbonate (p=0.001) were significantly low among patients who expired. For hematological markers, patients that expired had a significantly lower hemoglobin level (p<0.001), lymphocyte percentage (p=0.001), and platelet count (p=0.001); and a significantly higher ESR (p=0.013), total WBC (p=0.02), neutrophil percentage (p=0.02) and neutrophil: lymphocyte ratio (p<0.001). For biochemical markers, among expired patients, a significantly lower mean for N-Terminal Pro B-Type Natriuretic Peptide (p= 0.045) and Troponin I (p=0.001) and a significantly higher mean for C - reactive protein (p<0.001), serum ferritin (p<0.001), d- dimer (p<0.001), procalcitonin (p=0.037), random blood sugar (p<0.001), aspartate transaminase (p=0.001) and serum creatinine (p=0.019) were observed. This study adds valuable information to the body of literature on COVID - 19 among the Bangladeshi population. On the basis of this study, further research can be conducted and patient outcomes can be predicted.

Keywords: COVID-19, risk factors, clinical features, biochemical parameters, outcome.