Clinical Profiles and In-hospital Short-term Outcomes of Suspect, Probable, and Confirmed Adult COVID-19 Patients at the Philippine Heart Center: A Descriptive Study

Ana Katrina C. Longos, MD,[1] Maria Teresa B. Abola MD,[2] Irene S. Bandong MD,[2] Ma. Encarnita C. Blanco-Limpin MD,[2] Alexander A. Tuazon MD,[2] and Lorraine Grace Almelor-Sembrana MD[2]

Abstract

Introduction. COVID-19 emerged as a new disease during the early period of 2020. Given that our institution is a cardiac specialty center and our patients have numerous co-morbidities compared to the general population, we wanted to determine the clinical profiles and in-hospital short-term outcomes of suspect, probable and confirmed adult COVID-19 patients seen at our institution.

Methodology. We prospectively enrolled 323 adult (115 health care workers) suspect, probable and confirmed COVID-19 patients admitted from March to June 2020. We described and analyzed their clinical presentation, and in-hospital outcomes.

Results. There were 117 (36.22%) RT-PCR positive patients with 36.53% confirmed, 13.00% probable and 50.46% suspect patients. For probable and confirmed patients, 25%, 21.25%, 23.13% 16.25% had no, mild, moderate, and severe symptoms, respectively with 14.28% critical cases. Over-all mortality rate for probable and confirmed cases was 25.54% with 91.3% mortality rate for critical cases. Co-morbidities with statistically significant association with severity of disease were as follows: hypertension, heart disease, cerebrovascular disease, diabetes mellitus and COPD.

Conclusion. During the early period of the COVID-19 pandemic, only 36.53% of cases admitted at our institution were COVID-19 confirmed by RT-PCR. One-third of the cases were severe and critical, with more clinical instability, increased inflammatory markers, and higher in-hospital morbidity and mortality.

Keywords: COVID-19, SARS-COV2, pandemic, Philippines

Introduction

On Dec. 31, 2019, Chinese authorities alerted the World Health Organization (WHO) of pneumonia cases in Wuhan City, Hubei province, China, with an unknown cause. In February 2020, the WHO designated the disease COVID-19, which stands for coronavirus disease 2019.[1,2]

As of March 26, 2020, the Philippines had 707 confirmed cases of the coronavirus disease 2019 (COVID-19). Out of the 707 cases, there have been 28 patients who have recovered and 45 deaths.[3,4] The case fatality of the Philippines is 6.36% (95% CI: 4.68 to 8.42). (3,4) Patients with cardiovascular disease, diabetes, chronic respiratory disease, and hypertension have 10.5%, 7.3%, 6.3% and 6.0% of case fatality rates, respectively.[4]

By April 9, 2020, the Department of Health (DOH) shifted the initial classification of individuals from Persons under Investigation (PUI) and Persons Under Monitoring (PUM) to suspect, probable and confirmed COVID-19 cases.[5] The Philippine Society for Microbiology and Infectious Diseases (PSMID) further expounded on the classification for disease severity for probable and confirmed COVID-19 cases into mild, moderate, severe and critical cases.[6]

COVID-19 is a new disease that has been steadily spreading throughout the globe and throughout our

[1]Adult Cardiology Department, Philippine Heart Center
[2]Clinical Trial and Research Division, Philippine Heart Center
Corresponding Author: Ana Katrina C. Longos, MD eMail: ana_katrina09@yahoo.com

country. Information on its presentation, demographics, and prognosis are lacking; hence there is urgent need to gather clinical evidence to aid in the rapidly evolving clinical management. Given that our institution is a cardiac specialty center and our patients have numerous co-morbidities compared to the general population, we wanted to determine the clinical profiles and in-hospital short-term outcomes of suspect, probable and confirmed adult COVID-19 patients seen at our institution.

Methodology

The study was conducted in compliance with the Declaration of Helsinki and the 2017 Philippine National Ethical Guideline for Health and Health-related Research. Prior to the study initiation, the protocol was reviewed and approved by the Philippine Heart Center Institutional Ethics Review Board.

This was a descriptive study at a tertiary specialty center conducted from March 1, 2020 until June 30, 2020. Adults aged 19 years old and above, who consulted at the center with the diagnosis of suspect, probable and confirmed COVID-19 pneumonia were included in the study. Excluded were patients who were sent for home quarantine and/or isolation and were unable to have subsequent follow-up at least once and who were re-admitted for COVID-19 symptoms were excluded from the study.

Eligible patients were identified from the COVID-19 census of the Hospital Infection Control Unit (HICU), the COVID-19 census of the hospital infirmary, and the COVID-19 census of the hospital emergency room triage area (refer to *Figure 1*). Consecutive sampling strategy was utilized based on chronological date of consult.

Clinical information was collected using a standardized data collection form from the HICU database, *Medtrak*™ database, and/or respective patient's hospital chart. Co-morbidities were recorded as self-reported by the patient. For numerical laboratory tests with multiple measurements, the first measurement was recorded. The cut-off values for D-dimer (>1500 ng/mL), high-sensitivity troponin I (hs-troponin I; >29 ng/L), N-terminal-probrain natriuretic peptide (NT-proBNP; >300 pg/mL), were all based on the local and international guidelines.[7-9] For imaging tests, the first test result as written in the official result form was recorded. Physical examination findings were also recorded as on initial consult. Data extraction from hospital records was done by one of the primary investigators.

All COVID-19 cases who were admitted were monitored for their short-term outcomes while in the hospital until their discharge from the COVID areas or from the hospital. Recovery status was only reported for probable and confirmed patients.

The demographic and clinical characteristics of the patients were summarized using descriptive statistics. Frequency and proportion were used for categorical variables, median and interquartile range for non-normally distributed continuous variables, and mean and standard deviation for normally distributed continuous variables. *Analysis of Variance (ANOVA), Kruskal-Wallis* and *Pearson's Chi-square tests* were used to determine the significant differences of mean, rank, and frequency, respectively between suspect, probable, and confirmed adult COVID-19 patients, as well as according to severity.

All statistical tests were two-tailed tests. *Shapiro-Wilk* was used to test the normality of the continuous variables. Missing variables were neither replaced nor estimated. *STATA 13.1*™ was used for data analysis.

As of March 17, 2020 4:00 PM, the DOH laboratory status report showed there were 187 confirmed COVID-19 cases, 655 cases tested negative, and 184 cases pending test results, giving a total of 1026 cases.[3,10,11] Thus, the computed prevalence of confirmed COVID-19 positive cases was 18.23%. Using a 5% level of significance and a margin of error of 4.5%, the estimated minimum sample size was 283 patients.

Results

A total of 323 patients were enrolled, consisting of 117 COVID-19 confirmed cases, 43 COVID-19 probable cases and 163 COVID-19 suspect cases.

The baseline demographic and clinical characteristics of patients included in the study are shown in *Appendix A*. The mean age was 52.32 $\pm$ 17.52 years; with 55.94 $\pm$ 16.96 years in suspect patients, 48.86 $\pm$ 15.92 years in probable patients and 48.55 $\pm$ 17.92 years in confirmed patients ($p=0.001$). There were more males than females across all three COVID-19 groups.

The mean incubation period (interval from exposure to first symptoms) was five days with a range of 2 to 13 days with the shortest incubation period (four days, range of two to nine days) noted amongst confirmed COVID-19 compared to that documented in COVID-19 suspects and probable cases. The number of days from first symptom to consult was comparable in all three groups.

The most common co-morbidities observed across all three groups were heart disease (52.81%) and hypertension (50%) followed by diabetes mellitus (22.19%) and chronic kidney disease (13.13%). The co-morbidities of patients were comparable in the three groups except for hypertension, heart disease and cerebrovascular disease, which were noted more commonly in COVID-19 suspects compared to COVID-19 probable and confirmed patients.

As to exposure history, no noted exposure history was predominantly seen in all three groups (140 or 86.96% of suspect patients, 22 or 51.16% of probable patients and 47 or 40.52% of confirmed patients). Being a healthcare worker was noted to be the exposure history for 9 (5.59%) suspect patients, 18 (41.86%) probable patients and 38 (32.76%) confirmed patients. History of close contact was the exposure history for 7 (4.35%) suspect patients, 3 (6.98%) probable patients and 13 (11.21%) confirmed patients. Transmission of infection within the community was significantly noted in 17 (14.66%) confirmed patients.

Table I. Frequency and Comparison of In-hospital Short-term Outcomes of Suspect, Probable, and Confirmed COVID-19 Patients (n=323)

Parameter	Frequency (%)				P-value
	Total (n=323)	Suspect (n=163, 51%)	Probable (n=43, 13%)	Confirmed (n=117, 36%)	
High flow nasal cannula	10 (3.10)	4 (2.45)	0	6 (5.13)	0.201
Non-invasive ventilation	4 (1.24)	2 (1.23)	0	2 (1.71)	0.687
Mechanical ventilation	59 (18.27)	40 (24.54)	4 (9.30)	15 (12.82)	**0.011**
Hemodialysis	18 (5.57)	11 (6.75)	1 (2.33)	6 (5.13)	0.513
SLED	5 (1.55)	1 (0.61)	0	4 (3.42)	0.117
CRRT	2 (0.62)	1 (0.61)	0	1 (0.85)	0.830
ECMO	0	0	0	0	-
ARDS	65 (20.90)	45 (29.22)	4 (9.52)	16 (13.91)	**0.001**
Sepsis	139 (43.17)	85 (52.47)	9 (20.93)	45 (38.46)	**<0.001**
Septic shock	54 (16.88)	36 (22.5)	0	18 (15.38)	**0.002**
Acute mental state alteration	46 (14.42)	30 (18.87)	1 (2.33)	15 (12.82)	**0.019**
Acute renal failure	77 (23.84)	51 (31.29)	6 (13.95)	20 (17.09)	**0.006**
Transaminitis	22 (6.81)	14 (8.59)	0	8 (6.84)	0.138
Acute coronary syndrome					
STEMI	35 (10.84)	23 (14.11)	7 (16.28)	5 (4.27)	**0.015**
NSTEMI	26 (8.05)	21 (12.88)	0	5 (4.27)	**0.004**
Acute myocarditis	0	0	0	0	-
Drug-related adverse event	3 (0.93)	0	0	3 (2.56)	0.070
Arrhythmia	1 (0.31)	0	0	1 (0.85)	0.415
QT prolongation	2 (0.62)	0	0	2 (1.71)	0.172
Recovery	136 (42.11)	0	38 (90.48)	98 (83.76)	**<0.001**
Death	58 (18.01)	35 (21.60)	4 (9.30)	19 (16.24)	0.144

The most common presenting symptoms were shortness of breath (43.33%), cough (37.69%), fever (21.50%) and sore throat (12.77%). Of these presenting symptoms, fever, rhinorrhea, and myalgia were noted to be more significantly seen in COVID 19 confirmed compared to COVID-19 probable and suspects. Shortness of breath was noted more in COVID-19 suspects compared to probable and confirmed COVID-19 patients (59.26% vs 20.93% vs 29.57%, *p<0.001*).

Physical examination findings noted to be significantly different across the three groups were: heart rate (88 bpm, 75.5-109 in suspects vs 80 bpm, 70-90 in probable vs 85 bpm, 75-94 in confirmed; *p=0.039*, respiratory rate (21 bpm, 20-24 in suspects vs 19 bpm, 18-20 in probable vs 20 bpm, 18-20 in confirmed; *p=0.001* and SpO2 (96%, 92-98 in suspects vs 98%, 97-99 in probable vs 98%, 96-98.5 in confirmed; *p=0.001*).

The most common presenting chest x-ray findings of the all patients in the study was presence of bilateral interstitial infiltrates (44.26%) followed by absence of any parenchymal infiltrates (29.18%) and presence of unilateral interstitial infiltrates (22.30%). From these chest x-ray findings, absence of infiltrates was more frequently seen in COVID-19 confirmed than in the suspect and probable groups (45/44.12% vs 26/16.25% vs 18/41.86%, respectively, (*p<0.001*) while the presence of bilateral interstitial infiltrates was noted to be more commonly seen in COVID-19 suspects compared to probable and confirmed groups.

The WBC counts were higher in the suspect group than in the probable and confirmed groups (11.75 x 10^9/L vs 8.9 x 10^9/L vs 7.7 x 10^9/L respectively, *p=0.001*). Neutrophilia was more common in the suspect group than in the probable and confirmed groups (71%, 62%, and 64%, respectively, *p<0.001*) while the percent lymphocytes was lower in the suspect group than in the probable and confirmed groups (20%, 27%, and 24%, respectively, *p<0.001*). The other parameters of the complete blood count (CBC) were comparable between the three groups. The D-dimer levels were higher in the probable and confirmed groups than in the suspect group (85.19%, 80.43%, and 63.83%, respectively, *p=0.007*).

The CRP, AST, LDH, serum ferritin and procalcitonin levels were higher in the suspect group than in the probable and confirmed groups. Albumin levels were lower in the suspect group than in the probable and confirmed groups. High-sensitivity troponin I levels were more often high across the groups. The creatinine, NTproBNP and triglyceride levels were comparable among the three groups. In the arterial blood gas (ABG) results, lower results of $PaCO_2$, HCO_3 and P/F ratio were seen in the suspect group compared to the probable and confirmed groups with $PaCO_2$: 30mmHg, 33.5 mmHg, 33.4 mmHg, respectively, *p=0.013*), HCO_3: 20.5 mm/L, 20.8 mm/L, and 22.2 mm/L, respectively, *p=0.022*), and P/F ratio: 389, 530, and 442.5, respectively, *p=0.022*).

The most common rhythm on the electrocardiogram (ECG) was sinus rhythm (57.01%) followed by sinus tachycardia (20.36%) and arrythmia (18.55%). Sinus

Table II. Frequency and Comparison of In-hospital Short-term Outcomes of Probable and Confirmed COVID-19 Patients According to Severity (N=160)

Parameter	Frequency (%)					p-value
	Asymptomatic (n=40, 25%)	Mild (n=34, 21%)	Moderate (n=36, 23%)	Severe (n=27, 17%)	Critical (n=23, 14%)	
High flow nasal cannula	0	0	0	2 (7.41)	4 (17.39)	**0.002**
Non-invasive ventilation	0	0	0	0	2 (8.70)	**0.017**
Mechanical ventilation	0	0	1 (2.78)	0	18 (78.26)	**<0.001**
Hemodialysis	1 (2.5)	1 (2.94)	0	2 (7.41)	3 (13.04)	0.143
SLED	0	0	0	0	4 (17.39)	**<0.001**
CRRT	0	0	0	0	1 (4.35)	1.000
ECMO	0	0	0	0	0	-
ARDS	0	0	0	8 (29.63)	12 (57.14)	**<0.001**
Sepsis	0	3 (8.82)	12 (33.33)	20 (74.07)	19 (82.61)	**<0.001**
Septic shock	0	0	0	3 (11.11)	15 (65.22)	**<0.001**
Acute mental state alteration	0	0	1 (2.78)	4 (14.81)	11 (47.83)	**<0.001**
Acute renal failure	0	0	4 (11.11)	8 (29.63)	14 (60.87)	**<0.001**
Transaminitis	0	0	2 (5.56)	3 (11.11)	3 (13.04)	0.057
Acute coronary syndrome						
STEMI	0	1 (2.94)	4 (11.11)	5 (18.52)	2 (8.7)	**0.046**
NSTEMI	0	0	1 (2.78)	0	4 (17.39)	**0.001**
Acute myocarditis	0	0	0	0	0	-
Drug-related adverse event	0	0	0	1 (3.85)	2 (8.7)	0.078
Arrhythmia	0	0	0	0	1 (4.35)	0.203
QT prolongation	0	0	0	1 (3.85)	1 (4.35)	0.334
Recovery	40 (100)	34 (100)	35 (97.22)	25 (96.15)	2 (8.70)	**<0.001**
Death	0	0	1 (2.78)	1 (3.7)	21 (91.30)	**<0.001**

rhythm was 48.46%, 60% and 71.83% in the suspect, probable and confirmed groups respectively (*p=0.006*). Arrhythmia was noted more frequently in the suspect group than in the probable and confirmed groups (34, 3, and 4, respectively, *p=0.002*). QT intervals (actual and corrected) were comparable across the groups.

With regards to the two-dimensional echocardiogram (2DE), the mean left ventricular ejection fraction (LVEF) was 51.05 $\pm$ 14.76%. It was lower in the suspect group than in the probable and confirmed groups (48.75%, 54.11%, and 55.41%, respectively, *p=0.015*).

Of the different therapeutic options, the most given therapy was azithromycin (54.21%) followed by high dose vitamin C plus zinc (40.19%) and DVT prophylaxis (26.33%). Tocilizumab and prone positioning were utilized more frequently in the confirmed group than in the suspect and probable groups. Enoxaparin was more frequently given than unfractionated heparin for DVT prophylaxis (25.39 vs 1.24% respectively).

The baseline demographic and clinical characteristics of the 160 probable and confirmed patients included in the study are shown in *Appendix B*. The mean age of the patients was 40.75 $\pm$ 14.25 years for asymptomatic cases, 36.29 $\pm$ 8.79 years for mild cases, 51.44 $\pm$ 15.8 years for moderate cases, 58.59 $\pm$ 16.62 years for severe patients and 64.48 $\pm$ 15.26 years for critical cases (*p<0.001*). There were more males than females in the moderate to critical cases than in the asymptomatic and mild cases.

The mean incubation period was longest at 16 days amongst asymptomatic and critical patients (range of 2-23 days for asymptomatic patients and 16-16 days for critical patients). The number of days from first symptom to consult was comparable across mild, moderate, severe and critical cases.

The three most frequent co-morbidities across all groups were hypertension, heart disease and diabetes mellitus (all with *p<0.001*).

Most moderate to critical cases (55.56 -86.36%) had no documented history of exposure while most asymptomatic and mild cases had exposure as a healthcare worker (*p<0.001*).

Among patients who had symptoms, the most frequent ones were: cough for mild cases (20, 58.82%, *p<0.001*); fever (14, 38.39%) and cough (14, 38.39%) for moderate cases (*p<0.001*); and shortness of breath for severe (14, 51.85%), and critical cases (16, 76.19%) with *p<0.001*. Rhinorrhea (10, 29.41%, *p=0.001*) and sore throat (10, 29.41%, *p=0.011*) were noted more in mild cases.

The heart rates, systolic blood pressures, diastolic blood pressures and temperatures across the groups were similar (*p>0.05*). The respiratory rates of probable and confirmed COVID-19 patients on admission were higher at 22 (18-26.5) breaths per minute in critical patients compared to the other groups (*p=0.002*). Critical patients also showed the lowest SpO_2 of 92% (86-96%) compared to the other groups (*p<0.001*).

Most asymptomatic (22, 73.33%) and mild cases (26, 78.79%) showed no active parenchymal infiltrates (*p<0.001*) while critical cases (15, 78.95%) showed bilateral interstitial infiltrates (*p<0.001*).

On the initial chest CT scan done, all patient groups regardless of presence and severity of symptoms showed ground-glass opacities (*p=0.495*). However, asymptomatic (2, 25%) and mild cases (2, 14.29%) exhibited normal CT findings (*p=0.008*), moderate (20, 64.52%), severe (19, 82.61%), and critical cases (9, 75%) exhibited bilateral infiltrates (*p=0.045*), and critical cases (7 58.33%) exhibited consolidation (*p=0.012*).

With the complete blood count, the highest neutrophil counts (74%, Range: 65-79, *p<0.001*) and lowest lymphocyte counts (13%, Range: 11-22, *p<0.001*) were noted in the critical group while the lowest platelet count levels were noted in the severe (187 x 10^9/L, Range: 147-291) and critical groups (203 x 10^9/L, Range: 141-283) with a *p<0.001*. Critical patients were noted to have the highest CRP, ALT, AST, LDH, INR, creatinine, and procalcitonin levels. Critical patients were also noted to have the lowest albumin, PaO_2, SpO_2 and P/F ratio levels.

The most common electrocardiogram findings among all the groups was sinus rhythm (6-20 cases, *p=0.023*). Among the other rhythms, the second most common was sinus tachycardia seen in moderate to critical cases.

On the therapeutics given to the patients, there were significant differences across the groups except for the anticoagulation with unfractionated heparin for DVT prophylaxis. High dose vitamin C plus zinc was given across all groups, most frequently in asymptomatic (32, 80%), mild (30, 88.24%), and moderate (20, 55.56) cases (*p<0.001*). Lopinavir plus ritonavir (*p<0.001*), corticosteroids (*p<0.001*), tocilizumab (*p<0.001*), prone positioning (*p=0.002*) and hemoperfusion (*p=0.009*) were only given or done in severe confirmed COVID-19 patients. Hydroxychloroquine (*p=0.006*), chloroquine (*p=0.003*) and azithromycin (*p<0.001*) were given in all symptomatic patients. Oseltamivir was given to moderate, severe, and critical patients (at 5/13.89%, 4/14.81%, and 3/13.04%, respectively (*p=0.024*). DVT prophylaxis was given across all groups (*p=0.007*) with enoxaparin most frequently used across all groups.

The frequency and comparison of in-hospital outcomes of suspect, probable and confirmed COVID-19 patients are presented in *Table I*. There were more suspect (40, 24.54%) patients, than probable (4, 9.30%) and confirmed (15, 12.82%) patients who had mechanical ventilation (*p=0.011*). There were also more suspect patients who had ARDS, sepsis, septic shock, acute mental state alteration, acute renal failure, and acute coronary syndrome. Analysis between the groups with regards to those on home quarantine and those who were admitted was not done due to lack of events as there was only one patient who was on home quarantine. Deaths across all groups were comparable but the overall mortality rate was 18.01%.

Table II presents the frequency and comparison of in-hospital outcomes of probable and confirmed COVID-19 according to severity. There were significant differences in the frequency of in-hospital short-term outcomes between all groups with more critical patients seen in terms of high flow nasal cannula use, non-invasive ventilation, mechanical ventilation, SLED, ARDS, sepsis, septic shock, acute mental state alteration, acute renal failure and ACS-NSTEMI than in the other groups. There were more frequent recoveries in asymptomatic cases (40, 100%), mild cases (34, 100%), moderate cases (35, 97.22%), and severe cases (25, 96.15%, *p<0.001*) and more frequent deaths in critical cases (21, 91.30%, *p<0.001*).

Discussion

This study reported the clinical characteristics and in-hospital short-term outcomes of adult COVID-19 patients seen in a tertiary specialty institution.

The WHO declared the coronavirus disease 2019 (COVID-19) a global pandemic last March 11, 2020.[12] Between March 9, 2020 and June 30, 2020, a total of 323 patients were seen and 322 were subsequently admitted in our institution with one patient on home quarantine. The COVID-19 Medical Strike Team was then established which was tasked on the management of COVID-19 patients seen at our institution. (Memorandum M-OED-2020-81 Policy).[13]

Of all the patients seen, COVID-19 suspects were older which could be because our institution caters mostly to cardiac patients and that testing and subsequent admission were initially recommended by the DOH in the elderly and in those with comorbidities even if they only presented with mild symptoms.[14,15] Among probable and confirmed patients, age was significantly different among the severity classes with mild severity patients being younger than critical patients. Majority of the patients were males which was also seen in other studies.[16-18] Bienvenu and colleagues observed that male patients with COVID-19 were more symptomatic and exhibited increased disease severity, higher complication rates and ultimately higher mortality.[19] The association between sex and COVID 19 infection was not examined for significance in our study and could also be an area for further research.

Of all the patients tested, 36.22% were positive for SARS-COV2 per RT-PCR test, 13.31% either had positive serologic antibody tests or had diagnostics pointing to a probable COVID-19 infection. The rest turned out to have negative RT-PCR results regardless of serologic test results and were transferred to non-COVID-19 areas. They were designated in our study as suspects. The presence of antibodies as seen with the rapid antibody tests (RATs) could be affected by the day of illness when the testing was done. It was not initially standardized on what days of illness the RAT should be done. Some of the rapid antibody tests were done on the same day as RT-PCR tests especially in patients in whom the RAT was used for screening for illness due to the limited RT-PCR test kits available.

The time from exposure to first symptom for confirmed cases is numerically shorter compared to suspect and probable cases but did not reach statistically significant difference. However, this data was only available for 21 patients. The median incubation period in all patients was four days (IQR 1-7) which is comparable to the study by Guan, et al. that also showed a median incubation period of 4 days (IQR 2-7).[17]

Our institution specializes in cardiovascular care and indeed, the three most frequent co-morbidities seen in our patients were heart disease, hypertension and chronic kidney disease. However, the groups differed significantly in the frequency of co-morbidities of heart disease, hypertension, and cerebrovascular disease. Further studies can also be done to further elucidate the association between concomitant cardiac disease and COVID-19 infection, particularly if the former portends a poorer prognosis in this subset of patients as shown by Inciardi, et al.[20]

Huang, et al and Haw, et al showed that the common symptoms at the onset were fever, cough and myalgia or fatigue.[16,18] In our study, the most common presenting symptoms were shortness of breath, cough and fever. Probable and confirmed patients frequently presented with fever, rhinorrhea, and myalgia.

There was a decline in recent travel as a source of exposure as travel restrictions and lockdowns were implemented all over the world. The Philippines was placed on travel restrictions with Metro Manila on partial lockdown last March 15, 2020.[21] Haw, et al showed that full travel restrictions and the enhanced community quarantine (ECQ) decreased the reproductive number of COVID-19 infection to 0.9 from 2.4.[18]

Most of the patients who were seen at our institution noted no history of exposure to known COVID-19 cases. As for our own healthcare workers, the sources of exposure varied. There was a total of 115 (35.60%) healthcare workers that were included in the study. Out of the 115 healthcare workers, 65 (56.52%) had their exposure during their respective tours of duty while the others were from close contacts to confirmed cases outside of work as well as community exposure. This may indicate either breaks in infection control protocols and scarcity in personal protective equipment.

Majority of the patients seen in our institution turned out to be only COVID-19 suspects compared to probable and confirmed cases. This could be due to the initial DOH policy prioritizing those with co-morbidities as the ones who needed to be tested.[14] Among those who were considered probable and confirmed cases, we frequently saw more asymptomatic cases followed by moderate cases, mild cases, severe cases and critical cases, respectively. This was because most of the probable or confirmed cases were our healthcare workers who were unable to self-quarantine in their respective dwellings and opted to be admitted in our institution for facility quarantine.

With respect to vital signs on initial consult, COVID-19 suspects turned out to have higher heart rates, higher respiratory rates and lower oxygen saturation at room air and had significantly more frequent morbidity outcomes, specifically need for mechanical ventilation, ARDS, sepsis, septic shock, acute mental state alterations, acute renal failure, and acute coronary syndrome.

Most of the COVID-19 probable and confirmed cases, among which were our own healthcare workers, were asymptomatic, or had mild and moderate severity of illness. Suspect patients, on the other hand, were mostly cardiac patients who had other active comorbidities and concomitant infections that probably accounted for their symptoms and subsequent admission.

Severe and critical probable and confirmed patients presented with more clinical instability. On admission, they were significantly tachypneic and with lower SpO_2 on room air and blood tests showed significantly increased neutrophils, D-dimer, CRP, ALT, AST, LDH, serum ferritin, INR, creatinine, procalcitonin and significantly decreased lymphocytes, platelet count and serum albumin. ABG analysis revealed significantly more severe hypoxemia in these patients. Lymphopenia which was frequently seen in a study by Guan, et al was observed among our critical severity group.[17] The trend of elevated levels of INR and D-dimers in severe confirmed cases was also reported in a meta-analysis done by Yu and colleagues.[22]

Initial chest radiographs were most often normal but the more frequent abnormal findings among probable and confirmed patients were bilateral interstitial infiltrates. There were no differences on the chest CT scan findings across suspect, probable, and confirmed patients. However, among all probable and confirmed patients, ground glass opacities were noted in all regardless of severity. This was also shown in the study by Guan, et al.[17] Among probable and confirmed patients, the study likewise showed that the chest CT scan findings frequently seen were bilateral infiltrates and consolidation especially among patients with symptoms.

Siddiqi and Mehra proposed three clinical stages of COVID-19 infection which would explain the differences in the clinical symptoms and signs that were seen on admission. Patients who were seen during Stage I had mild constitutional symptoms and lymphopenia. Shortness of breath, with and without hypoxia, abnormal chest imaging were seen in stage II. ARDS, shock, cardiac failure, and elevated inflammatory markers were seen in stage III.[23] Mild to moderate patients were admitted during stage I while severe and critical patients were admitted during stages II and III.

During the early months of the pandemic, no antiviral had been shown safe and effective in the treatment of COVID-19.[24] At the start of this study, favipiravir, remdesivir, interferon, intravenous immunoglobulin and convalescent plasma transfusion were still not widely available in our country and in our institution. Antiviral, anti-inflammatory, and other medications were given to the patients based on the recommendation of the

COVID-19 Medical Strike Team. High-dose vitamin C and zinc were most frequently given in probable and confirmed patients across all severity groups. Lopinavir plus ritonavir, corticosteroids, tocilizumab, prone positioning and hemoperfusion were utilized in severe and critical patients while hydroxychloroquine and chloroquine were given across all severity groups. Oseltamivir was given in moderate to critical patients as part of the empirical therapy to cover for possible influenza. With the advent of results from subsequent studies, the use of hydroxychloroquine, chloroquine and oseltamivir was then halted.[25-27]

The recent update from the PSVM recommended the administration of VTE prophylaxis in COVID-19 patients.[7] This can be seen in the succeeding months wherein even asymptomatic confirmed patients were given DVT prophylaxis when their initial D-dimer results were elevated. The most common anticoagulant given was subcutaneous enoxaparin due to its ease of administration and less frequent need for adjustment compared to unfractionated heparin.[7] This would lead to decreased exposure for healthcare workers in administering the medication to confirmed COVID-19 patients.

Among the probable and confirmed patients, the most frequent morbidities occurred in the critical patients, such as the need for respiratory support (HFNC, NIV and MV), SLED, ARDS, sepsis, septic shock, acute mental state alterations, acute renal failure and NSTEMI. Mortality was significantly highest and recovery significantly lowest in critical patients. The over-all mortality rate for all patients was 18.01% with a combined mortality rate of 25.54% for probable and confirmed cases and 91.3% mortality rate for critical cases. This is significantly higher than in the study by Huang, et al and Guan, et al which had a 15% and 1.4% mortality rate, respectively.[16,17] This difference could be due to the availability of therapies at that time. In both studies, they were able to test for numerous inflammatory markers as well as viral load which prompted escalation of their therapeutics. They also used extracorporeal membrane oxygenation (ECMO) and intravenous immunoglobulin which were not employed during the early stages of the pandemic in our institution.[16,17]

The study showed 36.53% incidence rate for confirmed, 13.00% for probable and 50.46% for suspect adult COVID-19 patients seen from March 2020 until June 2020. For probable and confirmed adult COVID-19 patients, asymptomatic cases were frequently seen (25%), followed by mild symptoms (21.25%), moderate symptoms (23.13%), severe symptoms (16.25%) and critical cases (14.38%).

We recommend that further studies be done to compare the demographic characteristics, clinical presentations, and in-hospital short-term outcomes specifically of cardiac patients. We also recommend continuation of the study as more therapeutics have become available in our country and in our institution. Further studies can also be done on previously recovered patients who were subsequently readmitted for COVID-19 symptoms. A study on the comparison of the clinical profiles and outcomes of COVID-19 healthcare workers seen at our institution between 2020 and 2021 can also be done.

One of the limitations of the study was the underreporting especially during the start of the pandemic. Some of the healthcare workers went on self-imposed self-quarantine and were not included in the list from HICU and ER. Patients who initially presented with mild symptoms were not included in the initial population eligible for testing and this could be another cause of underreporting.

Another limitation of the study was that the management of COVID-19 suspect, probable and confirmed cases varied according to changing institutional policies and data reported from studies around the world as well as the availability of diagnostic tests and medications in our institution.

Conclusion

All COVID-19 case classifications who were seen and admitted at a tertiary specialty center were predominantly male, aged 52 years old, with concomitant hypertension, heart disease and cerebrovascular disease, and presented with shortness of breath, cough, and fever. Severe to critical patients presented with more clinical instability and increased inflammatory markers. In-hospital morbidity and mortality were highest in severe and critical probable and confirmed patients.

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APPENDIX A: Baseline Clinical Characteristics of All (suspect, probable, and confirmed) Adult COVID-19 patients (N= 323)

Parameter	Frequency (%); Mean ± SD; Median (IQR)				p-value
	Total (n=323)	Suspect (n=163, 51%)	Probable (n=43, 13%)	Confirmed (n=117, 36%)	
Demographics					
Age (years)	52.32 ± 17.52	55.94 ± 16.96	48.86 ± 15.92	48.55 ± 17.92	**<0.001**
Male	188 (58.20)	98 (60.12)	24 (55.81)	66 (56.41)	0.778
RT-PCR test Positive Negative	 117 (36.22) 206 (63.78)	 0 163 (100)	 0 43 (100)	 117 (100) 0	**<0.001**
Rapid antibody test (N= 216) Positive Negative	 79 (36.57) 137 (63.43)	 0 86 (100)	 41 (97.62) 1 (2.38)	 38 (43.18) 50 (56.82)	**<0.001**
Number of days from exposure to first symptom (N= 21)	5 (2 to 13)	11 (1 to 13)	15 (2 to 16)	4 (2 to 9)	0.635
Number of days from first symptom to consult (N= 233)	4 (1 to 7)	3 (1 to 7)	3.5 (1 to 7)	4 (2 to 8)	0.106
Co-morbidities *					
Hypertension	160 (50)	94 (58.02)	20 (46.51)	46 (40)	**0.011**
Diabetes mellitus	71 (22.19)	39 (24.07)	8 (18.60)	24 (20.87)	0.681
COPD	9 (2.81)	6 (3.70)	0	3 (2.61)	0.421
Bronchial asthma	13 (4.06)	5 (3.09)	2 (4.65)	6 (5.22)	0.661
Heart Disease	169 (52.81)	112 (69.14)	18 (41.86)	39 (33.91)	**<0.001**
Chronic kidney disease	42 (13.13)	26 (16.05)	5 (11.63)	11 (9.57)	0.276
Pregnancy	1 (0.31)	0	0	1 (0.87)	0.491
Immunocompromised state	11 (3.44)	8 (4.94)	0	3 (2.61)	0.238
Pulmonary TB	17 (5.31)	12 (7.41)	1 (2.33)	4 (3.48)	0.229
Bronchiectasis	4 (1.25)	3 (1.85)	0	1 (0.87)	0.561
Cerebrovascular Disease	31 (9.69)	23 (14.20)	2 (4.65)	6 (5.22)	**0.022**
Primary pulmonary hypertension	2 (0.63)	1 (0.62)	0	1 (0.87)	0.826
Exposure history					
No history of exposure	209 (65.31)	140 (86.96)	22 (51.16)	47 (40.52)	**<0.001**
Recent travel	3 (0.94)	3 (1.86)	0	0	
ILI cluster	3 (0.94)	2 (1.24)	0	1 (0.86)	
Healthcare worker	65 (20.31)	9 (5.59)	18 (41.86)	38 (32.76)	
Close contact	23 (7.19)	7 (4.35)	3 (6.98)	13 (11.21)	
Community	17 (5.31)	0	0	17 (14.66)	
Presenting symptoms *					
Fever	69 (21.50)	24 (14.72)	7 (16.28)	38 (33.04)	**0.001**
Cough	121 (37.69)	62 (38.04)	11 (25.58)	48 (41.74)	0.174
Rhinorrhea	25 (7.79)	5 (3.07)	3 (6.98)	17 (14.78)	**0.002**
Shortness of Breath	139 (43.44)	96 (59.26)	9 (20.93)	34 (29.57)	**<0.001**
Sore throat	41 (12.77)	15 (9.20)	5 (11.63)	21 (18.26)	0.081
Myalgia	11 (3.43)	1 (0.61)	0	10 (8.70)	**0.001**
Diarrhea	26 (8.10)	12 (7.36)	2 (4.65)	12 (10.43)	0.439
Headache	7 (2.18)	3 (1.84)	0	4 (3.48)	0.376
Anosmia	4 (1.25)	0	1 (2.33)	3 (2.61)	0.123
Physical examination on initial consult					
Heart rate	85 (74.5 – 101.5)	88 (75.5 – 109)	80 (70 – 90)	85 (75 – 94)	**0.039**
Systolic blood pressure	120 (100 – 130)	120 (96 – 130)	120 (110 – 122)	120 (110 – 130)	0.173
Diastolic blood pressure	77.5 (66.5 – 80)	70 (60 – 80)	77 (70 – 80)	80 (70 – 80)	0.131
Respiratory rate	20 (18 – 23)	21 (20 – 24)	19 (18 – 20)	20 (18 – 20)	**0.001**
Temperature (Celsius)	36.5 (36.2 – 36.7)	36.5 (36.2 – 36.8)	36.5 (36.2 – 36.6)	36.5 (36.2 – 36.7)	0.815
SpO_2 on room air	97 (94 – 98)	96 (92 – 98)	98 (97 – 99)	98 (96 – 98.5)	**0.001**
Chest x-ray on initial consult* (N=305)					
No active parenchymal infiltrates	89 (29.18)	26 (16.25)	18 (41.86)	45 (44.12)	**<0.001**
Bilateral interstitial infiltrates	135 (44.26)	86 (53.75)	12 (27.91)	37 (36.27)	**0.001**
Unilateral interstitial infiltrates	68 (22.30)	43 (26.88)	8 (18.60)	17 (16.67)	0.126
Consolidation	5 (1.64)	4 (2.52)	0	1 (0.98)	0.418
Chest CT scan (if done) * (N=214)					
Normal	6 (2.80)	2 (1.59)	1 (5.26)	3 (4.35)	0.425
Bilateral infiltrates	144 (67.29)	86 (68.25)	14 (73.68)	44 (63.77)	0.672
Ground glass opacities	172 (80.37)	102 (80.95)	14 (73.68)	56 (81.16)	0.744
Consolidation	69 (32.24)	40 (31.75)	3 (15.79)	26 (37.68)	0.192

Parameter	Frequency (%); Mean ± SD; Median (IQR)				p-value
	Total (n=323)	Suspect (n=163, 51%)	Probable (n=43, 13%)	Confirmed (n=117, 36%)	
Complete blood count on initial consult (N=303)					
WBC count (x10^9/L)	9.6 (6.9 – 13.6)	11.75 (8.35 – 15.5)	8.9 (6.6 – 14.5)	7.7 (6 – 10.3)	**0.001**
% neutrophils	67 (59 – 76)	71 (61 – 77)	62 (53 – 72)	64 (58 – 72)	**<0.001**
% lymphocytes	22 (14 – 20)	20 (13 – 27.5)	27 (18 – 34)	24 (17 – 32)	**<0.001**
Platelet count (x10^9/L)	246 (183 – 309)	236 (177 – 296.5)	272 (217 – 355)	249 (187 – 315)	0.106
Hematocrit	0.42 (0.38 – 0.45)	0.42 (0.37 – 0.45)	0.42 (0.37 – 0.46)	0.42 (0.39 – 0.45)	0.770
Hemoglobin (mg/dL)	137 (126 – 150)	137 (124 – 149)	137 (126 – 155)	139 (130 – 150)	0.598
Blood tests on admission (if done)					
D-dimer (ng/mL) (N=260)					
< 1500	73 (28.08)	51 (36.17)	4 (14.81)	18 (19.57)	**0.007**
≥ 1500	173 (71.92)	90 (63.83)	23 (85.19)	74 (80.43)	
CRP (ng/L) (N=254)	18 (5 – 48.7)	24.2 (8.4 – 51.2)	11.45 (5 – 44.8)	6.5 (5 – 39.8)	**0.001**
ESR (mm/hr) (N=61)	23 (12 – 35)	18 (8 – 35)	36 (12 – 70)	26 (18 – 30)	0.301
ALT (u/L) (N=266)	39 (23.71)	40.5 (22 – 92)	29.5 (23 – 50.5)	39 (27 – 62.5)	0.209
AST (u/L) (N=247)	43 (29 – 103)	50 (31 – 156)	34.5 (26.5 – 55.5)	39.5 (29 – 65)	**0.017**
LDH (u/L) (N=259)	290 (216 – 474)	313 (231 – 746)	264 (209 – 513)	246.5 (197 – 361.5)	**<0.001**
Serum Ferritin (ng/mL) (N=253)	404 (167.77 – 920.32)	453.18 (233.56 – 914.42)	232.01 (69.47 – 506.79)	402.6 (107.8 – 1170)	**0.024**
Prothrombin INR (N=238)	1.12 (1.04 – 1.34)	1.2 (1.055 – 1.585)	1.1 (1.03 – 1.2)	1.09 (1.02 – 1.2)	**<0.001**
Creatinine (mmol/L) (N=282)	0.06 (0.07 – 0.15)	0.1(0.7 – 0.17)	.075 (0.06 – 0.175)	0.09 (0.07 – 0.11)	0.297
Procalcitonin (ng/mL) (N=259)	0.09 (0.05 – 0.55)	0.15 – 0.05 – 0.94)	0.05 (0.05 – 0.105)	0.05 (0.5 – 0.36)	**<0.001**
Albumin (g/L) (N=237)	39.7 (33.9 – 43.2)	37.4 (32.2 – 41.7)	42.2 (35.45 – 44.2)	40.9 (35.7 – 45.4)	**0.003**
hs- Troponin I (ng/L) (N=100)					
≤ 29	22 (22)	11 (15.94)	2 (18.18)	9 (45)	**0.025**
> 29	78 (78)	58 (84.06)	9 (81.82)	11 (55)	
NTproBNP (pg/mL) (N=43)					
< 300	9 (20.93)	3 (13.64)	1 (33.33)	5 (27.78)	0.405
≥ 300	34 (79.07)	19 (86.36)	2 (66.67)	13 (72.22)	
Triglycerides (mmol/L) (N=66)	1.3 (1.06 – 2.1)	1 (1.21 – 2)	1.7 (1.2 – 3.1)	1.45 (1.15 – 2.05)	0.395
Fibrinogen	-	-	-	-	-
ABG (N=237)					
pH	7.4 (7.4 – 4.5)	7.424 (7.39 – 7.47)	7.4 (7.4 – 7.4)	7.421 (7.4 – 7.46)	0.491
$PaCO_2$ (mmHg)	31.7 (27.9 – 36.66)	30 (26.7 – 35.3)	33.5 (29 – 37.8)	33.4 (30.3 – 37)	**0.013**
PaO_2 (mmHg)	92.1 (75.7 – 114)	92 (75.7 – 114)	106 (76.1 – 135)	91.35 (75.3 – 110)	0.424
HCO_3 (mm/L)	21.2 (18.2 – 23.6)	20.5 (17.2 – 23.3)	20.8 (18.8 – 22)	22.2 (19.6 – 24.3)	**0.022**
SO_2 (%)	97 (94.6 – 98.4)	96.8 (94.3 – 98.65)	98.4 (94.5 – 98.9)	97 (95.3 – 98)	0.185
P/F ratio	422.5 (293 - 525)	389 (288 – 500)	530 (392.86 – 607)	442.5 (328 – 530)	**0.022**
ECG Findings (if done) (N=221)					
Rhythm					
Sinus rhythm	126 (57.01)	63 (48.46)	12 (60)	51 (71.83)	**0.006**
Sinus tachycardia	45 (20.36)	30 (23.08)	3 (15)	12 (16.90)	0.480
Sinus bradycardia	8 (3.62)	3 (2.31)	1 (5)	4 (5.63)	0.455
Arrhythmia	41 (18.55)	34 (26.15)	3 (15)	4 (5.63)	**0.002**
Paced rhythm	1 (0.45)	0	1 (5)	0	**0.006**
QTa (msec)	360 (320 – 380)	360 (320 – 380)	360 (320 – 400)	360 (320 – 360)	0.742
QTc (msec)	416.5 (388 – 453)	426 (397 – 465)	400 (430.5 – 450)	413 (383 – 448)	0.171
2D Echocardiogram Findings (if done)					
LVEF (%) (N=192)	51.05 ± 14.76	48.75 ± 14.52	54.11 ± 15.50	55.41 ± 14.1	**0.015**
LVEDD (cm/m^2) (N=180)	2.88 ± 0.672.88 ± 0.67	2.92 ± 0.69	2.98 (0.60)	2.73 ± 0.60	0.206
LVESD (cm/m^2) (N=180)	2.16 ± 0.71	2.22 ± 0.71	2.21 ± 0.85	2 ± 0.65	0.180
Wall motion abnormality *					
Normal	77 (40.10)	40 (32.79)	10 (52.63)	27 (52.94)	**0.024**
Segmental	90 (46.88)	65 (53.28)	7 (36.84)	18 (35.29)	0.063
Generalized	25 (13.02)	17 (3.93)	2 (10.53)	6 (11.76)	0.876
Akinesia	1 (0.52)	1 (0.82)	0	0	0.749
Therapeutics *					
Lopinavir/Ritonavir	18 (5.61)	12 (7.45)	0	6 (5.13)	0.162
Favipiravir	0	0	0	0	-
Remdesivir	0	0	0	0	-
Corticosteroids	16 (4.98)	9 (5.59)	0	7(5.98)	0.269
Hydroxychloroquine	19 (5.92)	6 (3.73)	2 (4.65)	11 (9.40)	0.131
Chloroquine	40 (12.46)	18 (11.18)	2 (4.65)	20 (17.09)	0.084
Tocilizumab	8 (2.49)	0	1 (2.33)	7 (5.98)	**0.007**

Parameter	Frequency (%); Mean ± SD; Median (IQR)				p-value
	Total (n=323)	Suspect (n=163, 51%)	Probable (n=43, 13%)	Confirmed (n=117, 36%)	
High dose Vitamin C/Zinc	129 (40.19)	32 (19.88)	20 (46.51)	77 (65.81)	**<0.001**
Prone positioning	11 (3.43)	4 (2.48)	1 (2.33)	6 (5.13)	0.446
Interferon	0	0	0	0	-
Intravenous immunoglobulin	0	0	0	0	-
Convalescent plasma transfusion	0	0	0	0	-
Hemoperfusion	6 (1.87)	2 (1.24)	0	4 (3.42)	0.260
Oseltamivir	22 (6.85)	10 (6.21)	0	12 (10.26)	0.068
Azithromycin	174 (54.21)	102 (63.35)	12 (27.91)	60 (51.28)	**<0.001**
DVT prophylaxis	86 (26.33)	37 (22.7)	6 (13.95)	43 (36.75)	**0.004**
Anticoagulation with Enoxaparin for DVT prophylaxis	82 (25.39)	34 (20.86)	6 (13.95)	42 (35.90)	**0.003**
Anticoagulation with unfractionated heparin for DVT prophylaxis	4 (1.24)	3 (1.84)	0	1 (0.85)	0.559

**Patients can have more than one parameter as findings/results*

APPENDIX B. Clinical Characteristics of Probable and Confirmed Adult COVID-19 Patients According to Severity (N= 160)

Parameter	Frequency (%); Mean ± SD; Median (IQR)					p-value
	Asymptomatic (n=40, 25%)	Mild (n=34, 21%)	Moderate (n=36, 23%)	Severe (n=27, 17%)	Critical (n=23, 14%)	
Demographics						
Age (years)	40.75 ± 14.25	36.29 ± 8.79	51.44 ± 15.8	58.59 ± 16.62	64.48 ±15.26	**<0.001**
Male	15 (37.50)	17 (50)	23 (63.89)	17 (62.96)	18 (78.26)	**0.016**
RT-PCR test Positive Negative	 28 (70) 12 (30)	 23 (67.65) 11 (32.35)	 28 (77.78) 8 (22.22)	 19 (70.37) 8 (29.63)	 19 (82.61) 4 (17.39)	0.686
Rapid antibody test (N= 130) Positive Negative	 24 (64.86) 13 (35.14)	 17 (60.71) 11 (39.29)	 16 (53.33) 14 (46.67)	 16 (66.67) 8 (33.33)	 6 (54.55) 5 (45.45)	0.829
Number of days from exposure to first symptom (N=14)	16 (2 – 23)	4 (3 – 5)	4 (0 – 9)	8.5 (2 -15)	16 (16 – 16)	0.504
Number of days from first symptom to consult (N=98)	0	3.5 (1 – 8)	6 (2 – 8)	5 (2 – 8)	4 (3 – 5)	0.263
Co-morbidities*						
Hypertension	8 (20)	4 (11.76)	20 (55.56)	19 (70.37)	15 (71.43)	**<0.001**
Diabetes mellitus	4 (10)	2 (5.88)	7 (19.44)	8 (29.63)	11 (52.38)	**<0.001**
COPD	0	0	0	0	3 (14.29)	**0.001**
Bronchial asthma	1 (2.5)	3 (8.82)	4 (11.11)	0	0	0.144
Heart Disease	2 (5)	5 (14.71)	17 (47.22)	17 (62.96)	16 (76.19)	**<0.001**
Chronic kidney disease	2 (5)	1 (2.94)	4 (11.11)	5 (18.52)	4 (19.05)	0.133
Pregnancy	0	1 (2.94)	0	0	0	0.452
Immunocompromised state	0	0	0	2 (7.41)	1 (4.76)	0.114
Pulmonary TB	1 (2.5)	0	2 (5.56)	0	2 (9.52)	0.240
Bronchiectasis	0	0	0	0	1 (4.76)	0.161
Cerebrovascular Disease	0	0	1 (2.78)	5 (18.52)	2 (19.52)	**0.004**
Primary pulmonary hypertension	0	0	0	1 (3.7)	0	0.300
Exposure history						
No history of exposure	5 (12.5)	4 (11.76)	20 (55.56)	21 (77.78)	19 (86.36)	**<0.001**
Recent travel	0	0	0	0	0	
ILI cluster	0	0	0	0	1 (4.55)	
Healthcare worker	26 (65)	20 (58.82)	6 (16.67)	3 (11.11)	1 (4.55)	
Close contact	2 (5)	7 (20.59)	4 (11.11)	2 (7.41)	1 (4.55)	
Community	7 (17.5)	3 (8.82)	6 (16.67)	1 (3.7)	0	
Presenting symptoms*						
Fever	0	12 (35.29)	14 (38.89)	12 (44.44)	7 (33.33)	**<0.001**
Cough	0	20 (58.82)	14 (38.89)	11 (40.74)	14 (66.67)	**<0.001**

Parameter	Frequency (%); Mean ± SD; Median (IQR)					p-value
	Asymptomatic (n=40, 25%)	Mild (n=34, 21%)	Moderate (n=36, 23%)	Severe (n=27, 17%)	Critical (n=23, 14%)	
Rhinorrhea	0	10 (29.41)	7 (19.44)	3 (11.11)	0	**0.001**
Shortness of Breath	0	2 (5.88)	11 (30.56)	14 (51.85)	16 (76.19)	**<0.001**
Sore throat	0	10 (29.41)	7 (19.44)	6 (22.22)	3 (14.29)	**0.011**
Myalgia	0	4 (11.76)	4 (11.11)	2 (7.41)	0	0.123
Diarrhea	0	5 (14.71)	3 (18.33)	4 (18.41)	2 (9.52)	0.163
Headache	0	3 (8.82)	1 (2.78)	0	0	0.101
Anosmia	0	2 (5.88)	2 (5.56)	0	0	0.271
Physical examination on initial consult						
Heart rate	80 (72 – 83)	83 (75 – 90)	88 (72.5 – 102)	85 (75 – 93)	91 (72 – 120)	0.143
Systolic blood pressure	120 (110 – 120)	110 (110 – 130)	120 (110 – 130)	120 (100 – 130)	120 (100 – 130)	0.562
Diastolic blood pressure	80 (70 – 80)	70 (70 – 80)	79 (70 – 80)	80 (60 – 80)	70 (70 – 90)	0.913
Respiratory rate	18 (18 – 20)	20 (18 – 20)	20 (18 – 20.5)	20 (19 – 24)	22 (18 – 26.5)	**0.002**
Temperature (°C)	36.35 (36.2 – 36.5)	36.55 (36.5 – 36.7)	36.5 (36.3 – 36.95)	36.5 (36.2 – 36.7)	36.3 (36.2 – 36.5)	0.046
SpO_2 on room air	98 (98 – 99)	98.5 (98 – 99)	98 (97 – 98.5)	97 (94 – 98)	92 (86 – 96)	**<0.001**
Chest x-ray on initial consult* (N=145)						
No active parenchymal infiltrates	22 (73.33)	26 (78.79)	12 (33.33)	3 (11.11)	0	**<0.001**
Bilateral interstitial infiltrates	4 (13.33)	2 (6.06)	17 (47.22)	11 (40.74)	15 (78.95)	**<0.001**
Unilateral interstitial infiltrates	3 (10)	4 (12.12)	5 (13.89)	10 (37.04)	3 (15.79)	0.051
Consolidation	0	0	0	0	1 (5.26)	0.154
Chest CT scan (if done)* (N=88)						
Normal	2 (25)	2 (14.29)	0	0	0	**0.008**
Bilateral infiltrates	2 (25)	8 (57.14)	20 (64.52)	19 (82.61)	9 (75)	**0.045**
Ground glass opacities	6 (75)	9 (64.29)	26 (83.87)	20 (86.96)	9 (75)	0.495
Consolidation	0	1 (7.14)	11 (35.48)	10 (43.48)	7 (58.33)	**0.012**
Complete blood count on initial consult* (N=147)						
WBC count ($x10^9$/L)	8.1 (7.2 – 10.6)	7.65 (6 – 9.5)	6.8 (6 – 10.2)	8.3 (5.9 – 12.1)	9.9 (7.7 – 12.5)	0.239
% neutrophils	59 (52 – 62)	63.5 (56 – 71)	63 (57.5 – 73.5)	69 (58 – 74)	74 (65 – 79)	**<0.001**
% lymphocytes	32 (28 – 37)	32 (28 – 37)	26.5 (19 – 32.5)	21 (15 – 28)	13(11 – 22)	**<0.001**
Platelet count ($x10^9$/L)	294 (264 – 340)	294 (264 – 340)	242 (180 – 316)	187 (147 – 291)	203 (141 – 283)	**<0.001**
Hematocrit	0.42 (0.39 – 0.45)	0.42 (0.39 – 0.45)	0.435 (0.39 – 0.46)	0.38 (0.36 – 0.45)	0.42 (0.38 – 0.45)	0.266
Hemoglobin (mg/dL)	141 (133 – 149)	141 (133 – 149)	145.5 (129 – 154)	131 (116 – 148)	137 (127 – 151)	0.254
Blood tests on admission (if done)						
D-dimer (ng/mL) (N=119) <1500 ≥ 1500	 19 (100) 0	 19 (79.17) 5 (20.83)	 32 (88.89) 4 (11.11)	 20 (80) 5 (20)	 7 (46.67) 8 (53.33)	**0.002**
CRP (ng/L) (N=113)	5 (5 – 5)	5 (5 – 6.3)	12 (5 – 31.6)	22.7 (10 – 45.95)	67.15 (51.5 – 148.3)	**<0.001**
ESR (mm/hr) (N=31)	18 (18 – 18)	21.5 (15 – 28.5)	27 (20 – 36)	26 (12 – 93)	27 (26 – 30)	0.751
ALT (u/L) (N=120)	30 (18 – 45)	29 (19 – 48)	39 (30 – 36)	42 (27 – 68)	54 (41 – 85)	**0.004**
AST (u/L) (N=110)	29 (22 – 33)	29 (27 – 36)	40 (29 – 61.51)	65 (40 – 116)	62 (47 – 85)	**<0.001**
LDH (u/L) (N=119)	190 (162 – 205)	211 (184 – 232)	257.5 (209.5 – 326)	376 (294 – 548)	448 (296 – 933)	**<0.001**
Serum Ferritin (ng/mL) (N=117)	78.19 (60.3 – 160.06)	167.6 (51.34 - 534.77)	367.89 (142.96 – 644.02)	553.94 (192.68 – 1191.2)	1200 (954.58 – 1200)	**<0.001**
Prothrombin INR (N=106)	1.01 (0.98 – 1.03)	1.07 (0.99 – 1.1)	1.095 (1.04 – 1.2)	1.1 (1.04 – 1.54)	1.17 (1.1 – 1.25)	**<0.001**
Creatinine (mmol/L) (N=127)	0.07 (0.06 – 0.08)	0.065 (0.05 – 0.09)	0.09 (0.04 – 0.11)	0.1 (0.07 – 0.2)	0.14 (0.09 – 1.75)	**<0.001**
Procalcitonin (ng/mL) (N=118)	0.5 (0.5 – 0.5)	0.05 (0.05 – 0.05)	0.05 (0.05 – 0.15)	0.085 (0.05 – 0.7)	0.55 (0.2 – 4.15)	**<0.001**
Albumin (g/L) (N=109)	45 (41.1 – 46)	43.1 (40.7 – 46.2)	42.5 (38.3 – 45.9)	35.65 (34.5 – 43)	33.7 (30.5 – 36.9)	**<0.001**
hs- Troponin I (ng/L) (N=31) ≤ 29 > 29	 0 0	 0 1 (100)	 4 (44.44) 5 (55.56)	 2 (25) 6 (75)	 5 (38.46) 8 (61.54)	0.869
NTproBNP (pg/mL) (N=21) < 300 ≥ 300	 0 0	 0 0	 1 (20) 4 (80)	 1 (20) 4 (80)	 4 (36.36) 7 (63.64)	1.000
Triglycerides (mmol/L) (N=24)	2.2 (2.2 – 2.2)	1.95 (1.3 – 2.86)	1.6 (1.2 – 1.7)	1.2 (0.8 – 2)	1.765 (1.1 – 2.3)	0.419

Parameter	Frequency (%); Mean ± SD; Median (IQR)					p-value
	Asymptomatic (n=40, 25%)	Mild (n=34, 21%)	Moderate (n=36, 23%)	Severe (n=27, 17%)	Critical (n=23, 14%)	
Fibrinogen	-	-	-	-	-	-
ABG (n=100)						
pH	7.402 (7.4 – 7.41)	7.41 (7.4 – 7.44)	7.41 (7.38 – 7.46)	7.44 (7.41 – 7.46)	7.43 (7.36 – 7.49)	0.195
$PaCO_2$ (mmHg)	32.85 (30.3 – 36.6)	34.7 (31.2 – 37.1)	-35.7 (30.6 – 38.5)	32.3 (30.8 – 36.6)	30.9 (27.2 – 35.3)	0.280
PaO_2 (mmHg)	106.5 (98.3 – 121)	108 (89.8 – 115)	102 (79.8 – 125)	80 (69.8 – 92)	70.8 (58.8 – 97.6)	**<0.001**
HCO_3 (mm/L)	20.25 (18.2 – 22.2)	22 (20.8 – 23.5)	22.2 (19.6 – 24.4)	21.5 (19.6 – 24)	22.2 (19.5 – 24.2)	0.732
SO_2 (%) (N=100)	97.45 (97 – 98.2)	98.5 (97.6 – 99.3)	97.4 (96.3 – 98.4)	95.8 (94.4 – 98.2)	94.3 (90 – 96.7)	**<0.001**
P/F ratio (N=99)	532.5 (481.5 – 605)	533 (449 – 571)	490 (390 - 575)	347 (263 – 439)	236 (178 – 404)	**<0.001**
ECG Findings (if done) (N=91)						
Rhythm						
Sinus rhythm	6 (100)	11 (84.62)	19 (65.52)	20 (76.92)	7 (41.18)	0.023
Sinus tachycardia	0	0	5 (17.24)	3 (11.54)	7 (41.18)	0.019
Sinus bradycardia	0	2 (15.38)	3 (10.34)	0	0	0.158
Arrhythmia	0	0	2 (6.90)	2 (7.69)	3 (17.65)	0.408
Paced rhythm	0	0	0	1 (3.85)	0	0.640
QTa (msec)	340 (320 – 360)	360 (320 – 400)	360 (320 – 400)	360 (320 – 380)	320 (320 – 340)	0.082
QTc (msec)	388 (383 – 413)	388 (376 – 423)	416 (388 – 447)	419 (398 – 456)	427 (396 – 462)	0.115
2D Echocardiogram Findings (if done)						
LVEF (%) (N=70)	61.5 ± 6.66	60.43 ± 5.59	54.54 ± 16.91	54.52 ± 16.48	52.83 ± 12.45	0.697
LVEDD (cm/m^2) (N=65)	2.43 ± 0.29	2.75 ± 0.38	2.94 ± 0.65	2.89 ± 0.65	2.62 ± 0.67	0.389
LVESD (cm/m^2) (N=65)	1.65 + 0.29	1.88 + 0.29	2.09 + 0.66	2.24 + 0.84	1.97 + 0.73	0.522
Wall motion abnormality*						
Normal	3 (75)	6 (85.71)	10 (50)	10 (47.62)	8 (44.44)	0.328
Segmental	1 (25)	1 (14.29)	7 (35)	7 (33.33)	9 (50)	0.516
Generalized	0	0	3 (15)	4 (19.05)	1 (5.56)	0.480
Akinesia	0	0	0	0	0	-
Therapeutics*						
Lopinavir/Ritonavir	0	0	0	1 (3.7)	5 (21.74)	<0.001
Favipiravir	0	0	0	0	0	-
Remdesivir	0	0	0	0	0	-
Corticosteroids	0	0	0	2 (7.41)	5 (21.74)	<0.001
Hydroxychloroquine	0	3 (8.82)	8 (22.22)	1 (3.70)	1 (4.35)	0.006
Chloroquine	0	3 (8.82)	5 (13.89)	8 (29.63)	6 (26.09)	0.003
Tocilizumab	0	0	0	2 (7.41)	6 (26.09)	<0.001
High dose Vitamin C/Zinc	32 (80)	30 (88.24)	20 (55.56)	12 (44.44)	3 (13.04)	<0.001
Prone positioning	0	0	0	3 (11.11)	4 (17.39)	0.002
Interferon	0	0	0	0	0	-
Intravenous immunoglobulin	0	0	0	0	0	-
Convalescent plasma transfusion	0	0	0	0	0	-
Hemoperfusion	0	0	0	1 (3.70)	3 (13.04)	0.009
Oseltamivir	0	0	5 (13.89)	4 (14.81)	3 (13.04)	0.024
Azithromycin	0	9 (26.47)	31 (86.11)	19 (70.37)	13 (56.52)	<0.001
DVT prophylaxis	9 (22.50)	4 (11.76)	13 (36.11)	14 (51.85)	9 (39.13)	0.007
Anticoagulation with Enoxaparin for DVT prophylaxis	9 (22.5)	4 (11.76)	13 (36.11)	13 (48.15)	9 (39.13)	0.016
Anticoagulation with unfractionated heparin for DVT prophylaxis	0	0	0	1 (3.70)	0	0.292

**Patients can have more than one parameter as findings/results*

APPENDIX C. Data Collection Form

Patient Code: _____ Data collected by: _____
Age: _____Sex: _____ Date of collection: _____
Date of consult: _____Date of exposure: _____Date of first symptom: _____

COVID RT-PCR test done: ☐No ☐Yes, date: _____ Result: ☐Positive ☐Negative
COVID rapid antibody test done: ☐No ☐Yes, date: _____ Result: ☐Positive ☐Negative
Exposure history: ☐Recent travel ☐ILI cluster ☐Healthcare worker
☐ Close contact ☐ Community ☐ None

Comorbidities: ☐Hypertension ☐Diabetes
(Check all present) ☐COPD ☐Bronchial asthma
☐Heart disease ☐ Chronic kidney disease
☐Pregnancy ☐Immunocompromised state
☐Pulmonary TB ☐Bronchiectasis
☐Cerebrovascular disease ☐Primary pulmonary hypertension

Patient classification: (PSMID 3262020 GUIDELINE)
☐ Non-COVID case (Neither PUM or PUI) ☐ Confirmed (COVID-19 RT-PCR Positive)
☐ Suspect (PUI not tested and for testing) ☐ Unclassified (PUM)
☐ Probable (PUI Inconclusive, inadequate or no available testing)

Symptoms: ☐Fever ☐Cough ☐Rhinorrhea
(Check all present) ☐Shortness of breath ☐Sore throat ☐Myalgia
☐Diarrhea ☐Headache ☐Anosmia

Physical examination on initial consult:
BP _____ HR _____RR _____Temp _____ SpO2 at room air _____

Abdominal findings on initial consult:
☐Hepatomegaly ☐Splenomegaly

Chest x-ray result on initial consult: Date of chest x-ray: _____
☐Bilateral interstitial infiltrates ☐Bilateral haziness ☐Consolidation
☐Unilateral interstitial infiltrates ☐Unilateral haziness

Location of chest x-ray lesions:
☐Lower lung fields ☐Middle lung fields ☐Upper lung fields
☐Peripheral ☐Central

Chest CT scan result (if done): Date of chest CT scan: _____
☐Bilateral infiltrates ☐Consolidation ☐Ground glass opacities

CBC on initial consult: Date of CBC: _____
WBC count (x 10^9/L): _____ % neutrophils: _____% lymphocytes: _____
Platelet count: _____Hb (mg/dL): _____Hct: _____

Blood tests (if admitted):
D-dimer (ng/mL): _____LDH (u/L): _____PT INR: _____
CRP: _____Serum ferritin: _____ALT (u/L): _____ Creatinine: _____
ESR: _____ AST (u/L): _____
ABG: pH_____ $PaCO_2$ _____PaO_2 _____
HCO_3 _____ P/F ratio: _____
Procalcitonin(ng/ml) _____hs-Troponin I: _____NTproBNP(pg/ml) _____
Triglycerides(mmol/L) _____Fibrinogen(mg/dl) _____Albumin (g/L) _____

ECG Findings:
Rhythm _____Arrhythmia _____Type: _____
QTa(ms) _____ QTc (ms)_____

Transthoracic 2D echocardiogram (if done): Date: _____
LVEF (Simpson's): _____LVEDD: _____LVESD: _____
LV wall motion: ☐Normal ☐Segmental hypokinesia ☐Generalized hypokinesia
☐Akinesia ☐Others: _____

Therapeutics given:

☐ Lopinavir-Ritonavir	☐ Favipiravir	☐ Remdesivir
☐ Corticosteroids	☐Hydroxychloroquine	☐Chloroquine
☐Tocilizumab	☐High dose vitamin C+zinc	☐ Prone positioning
☐ Interferon	☐ Intravenous immunoglobulin	☐ Oseltamivir
☐ Convalescent plasma transfusion	☐Hemoperfusion	☐ Azithromycin
☐ DVT prophylaxis: ☐Enoxaparin	☐UFH	

Clinical outcomes:
☐Hospital admission: date _____ ☐Hospital discharge: date _____
☐Death: date _____ ☐Mechanical ventilation: date _____
☐High-flow nasal cannula: date _____ ☐Non-invasive ventilation: date _____
☐Hemodialysis: date _____ Type: ☐SLED ☐CRRT
☐ECMO: date _____ ☐Recovery: date_____
☐PUI not admitted

Complications:
☐ARDS: date _____ ☐Sepsis: date _____
☐Acute mental state alteration: date: _____ ☐Septic shock: date: _____
☐Acute renal failure: date: _____ ☐Transaminitis: date: _____
☐ACS: date _____ ☐STEMI ☐NSTEMI ☐Acute myocarditis: date: _____
☐Drug-related adverse events: suspected drug: _____Date of onset: _____
Type: ☐Arrhythmia: _____☐QT prolongation: _____

APPENDIX D. Operational Definitions

1) Person Under Investigation (PUI) – refers to patients presenting with symptoms of acute respiratory illness (fever of at least 38 degrees Celsius and/or cough or shortness of breath or other respiratory symptoms) with one or more of the following exposures:
   a) Travel to or residence in a country/area reporting local transmission of COVID-19 within 14 days prior to onset of symptoms
   b) Close contact with a confirmed COVID-19 case within 14 days prior to onset of symptoms – defined as either of the following: providing direct care without proper personal protective equipment to a confirmed COVID-19 patient; staying in the same close environment (including workplace, classroom, household, gatherings); or, traveling together in close proximity (1 meter or 3 feet) in any kind of conveyance
   c) Patient with severe acute respiratory infection or atypical pneumonia and requiring hospitalization and with no other etiology to fully explain the clinical presentation, regardless of exposure history
   d) Cluster of influenza-like illness cases in household or workplace
2) Person Under Monitoring (PUM) – asymptomatic patients with appropriate exposure history. In the new case definitions of the DOH, this corresponds to "Asymptomatic".
3) Influenza- like Illness (ILI) – is a condition with sudden onset (within 3 days of presentation and fever should be measured at the time of presentation) of fever of $\geq$ 38°C and cough or sore throat in the absence of other diagnoses
4) Severe Acute Respiratory Illness (SARI) - is an acute respiratory illness with onset during the previous 7 days requiring overnight hospitalization. A SARI case should meet the ILI definition and any one of the following: (a) shortness of breath or difficulty of breathing, (b) severe pneumonia of unknown etiology, acute respiratory distress, or severe respiratory disease possibly due to novel respiratory pathogens (such as COVID-19)

5) COVID- 19 suspect case- is a person who is presenting with any of the conditions below:
   a) All Severe Acute Respiratory Illness (SARI) cases where no other etiology fully explains the clinical presentation.
   b) ILI cases with any of the following:
      i) With no other etiology that fully explains the clinical presentation and a history of travel to or residence in an area that reported local transmission of COVID-19 disease during the 14 days prior to symptoms onset OR
      ii) With contact to a confirmed or probable case of COVID-19 in the two days prior to onset of illness of the probable/confirmed COVID-19 case until the time the probable/confirmed COVID-19 case became negative on repeat testing
   c) Individuals with fever or cough or shortness of breath or other respiratory signs or symptoms fulfilling any one of the following conditions:
      i) Aged 60 years and above
      ii) With a comorbidity
      iii) Assessed as having a high-risk pregnancy
      iv) Healthcare worker
6) COVID-19 probable case- a suspect case who fulfills anyone of the following listed below:
   a) Suspect case whom testing for COVID-19 is inconclusive
   b) Suspect who tested positive for COVID-19 but whose test was not conducted in a national or subnational reference laboratory or officially accredited laboratory for COVID-19 confirmatory testing
7) COVID-19 confirmed case – any individual, irrespective of presence or absence of clinical signs and symptoms, who was laboratory confirmed for COVID-19 in a test conducted at the national reference laboratory, a subnational reference laboratory, and/or DOH-certified laboratory testing facility
8) Laboratory confirmation- detection of the presence or absence of SARS-CoV-2 via real-time reverse transcription–polymerase chain reaction (rRT-PCR) assay
9) COVID negative case – a patient with laboratory confirmation of the absence of SARS-CoV-2 via real-time reverse transcription–polymerase chain reaction (rRT-PCR) assay
10) Short-term outcomes – included: home quarantine, recovery, death, hospital admission, hospital discharge, high-flow nasal cannula oxygenation, non-invasive ventilation (NIV), mechanical ventilation, hemodialysis including continuous renal replacement therapy (CRRT) and sustained low efficiency dialysis (SLED), extra-corporeal membrane oxygenation (ECMO), and complications (ARDS, sepsis, septic shock, acute alteration of mental state) as defined in the Philippine Society for Microbiology and Infectious Diseases (PSMID) interim guideline on the clinical management of patients with suspected and confirmed 2019 novel coronavirus (nCOV) acute respiratory disease (version 1.0). Also included are: acute myocarditis as defined by the ACC/AHA Scientific Statement on recognition and initial management of fulminant myocarditis 2020; transaminitis as defined by Hiegar in 2019 Gastrointestinal Emergencies; acute renal failure as defined by the RIFLE criteria; ST-elevation myocardial infarction (STEMI) as defined by the ACC/AHA 2017 Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction; and non-ST elevation myocardial infarction (NSTEMI) as defined by the 2014 ACC/AHA Guideline for the Management of Patients With Non–ST-Elevation Acute Coronary Syndromes. Adverse drug event will be defined as per the World Health Organization Safety of Medicines Guide to Detecting and Reporting Adverse Drug Reactions (2002).
11) Recovery – defined in the old PSMID interim guideline as patients who have clinically recovered and with two consecutive negative RT-PCR tests for nCOV. However, as of July 6, 2020, the DOH redefined clinical recovery in suspect, probable and confirmed COVID-19 patients when these patients are no longer symptomatic and have completed at least 14 days of isolation without RT-PCR or antibody testing, provided that a licensed medical doctor clears the patient.
12) Disease severity classification of adult patients with probable or confirmed COVID-19:
   a) Mild case- patients presenting with any of the following: fever, cough, fatigue, anorexia, myalgias and other non-specific symptoms such as anosmia or ageusia preceding onset of respiratory symptoms, sore throat, nasal congestion, headache, diarrhea, nausea and vomiting with no signs of pneumonia of hypoxia
   b) Moderate case- patients with signs of non-severe pneumonia (eg fever, cough, dyspnea, or difficulty of breathing), respiratory rate of 21-30 breaths per minute, oxygen saturation (SpO_2) >92% on room air
   c) Severe case- patients with severe pneumonia or severe acute respiratory infection, as follows: fever, cough, dyspnea, respiratory rate >30 breaths/minute, severe respiratory distress or SpO_2 <92% on room air
   d) Critical case- onset within 1 week of known clinical insult (pneumonia) or new or worsening respiratory symptoms, progressing infiltrates on chest x-ray or chest CT with respiratory failure not fully explained by cardiac failure or fluid overload (COVID-ARDS) and with either sepsis or septic shock