

## CLINICAL & SUBCLINICAL CHARACTERISTICS OF PATIENTS HOSPITALIZED WITH SARS-COV-2 INFECTION IN FIELD HOSPITALS, VINH PHUC PROVINCE

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### ABSTRACT

**Objectives:** To describe the clinical features, laboratory findings, and treatment outcomes of 1040 cases diagnosed infected with SARS-CoV-2 at 3 Field Hospitals in Vinh Phuc Province. **Subjects and method:** A retrospective investigation was conducted on 1040 patients infected with SARS-CoV-2 and admitted to 3 field hospitals in Vinh Phuc Province, from May 2021 to December 2021. The diagnosis of SARS-CoV-2 infection was confirmed by portable RT-PCR assay. **Results:** A total of 1040 patients were hospitalized with SARS-CoV-2 infection, of which the majority of cases (91.5%) were classified as mild type at the time of admission. The median (IQR) age was 34 (18-49) years. It is noteworthy that only a minority of the patients presented with comorbidities such as hypertension (4.6%), diabetes (1.6%), COPD (0.2%), and CKD (0.1%). The proportion of unvaccinated COVID-19 patients was 63.5%, while only 0.9% received all 3 vaccine doses. The most common clinical feature on admission was cough (60.3%), followed by sore throat (27.3%), fever (11.3%), muscle fatigue (10%), headache (9.7%), and shortness of breath (9%). The majority of paraclinical indicators were within normal levels, except Lymphocytes. Straight

Chest X-ray Scans showed a vast majority of patients (95.8%) had normal results, and few cases had abnormal laboratory parameters. Of all the patients, 313 (30.1%) cases received antiviral therapy, 96 (9.3%) cases received nasal oxygen therapy, 10 (0.96%) cases received HFNC/NIV, and only 3 (0.29%) cases received invasive mechanical ventilation. Regarding treatment outcomes, 828 (79.6%) patients were discharged with a mean hospital stay was 14.2±8.6 days, and only 1 (0.1%) case died. **Conclusion:** The present study reveals that most patients with mild COVID-19 were admitted to three Field Hospitals located in Vinh Phuc Province. Clinical manifestations primarily involved the respiratory system. The mean hospital stay duration was 14.2±8.6 days. Of the COVID-19 patients, 828 (79.6%) cases were discharged from the hospital, while only 1 case died (0.1%).

**Keywords:** Covid-19, SARS-CoV-2, PCR.

### I. INTRODUCTION

COVID-19 is an acute respiratory infection caused by a novel strain of the SAR-CoV-2 virus, which is mostly transmitted by droplets and direct contact [5]. According to WHO estimates, the outbreak has quickly disseminated across the globe, placing a noteworthy strain on healthcare services, resulting in over 600 million infected and 6 million fatalities [6]. The SAR-CoV-2 virus is constantly mutating, resulting in a plethora of variants that heighten the chance of infection and the potential for severe illness.

Patients with COVID-19 often present with symptoms of fever, dry cough,

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fatigue, and ageusia and may develop other symptoms such as diarrhea, myalgia, rash, chest tightness, etc [2]. Subclinical features such as Complete Blood Count (CBC) and Biochemical testing revealed that these patients had high C-reactive protein (CRP), D-dimer, and AST levels, in contrast to normal lymphocyte counts [8], [1], [7]. Over 20% of patients may develop severe illnesses, such as pneumonia, ARDS, myocarditis, coagulopathy, and multiple organ dysfunction syndrome, which will result in mortality [4]. Minding clinical and laboratory features, as well as early diagnosis of severe prognostic factors, can help patients reduce disease progression and prevent complications [3]. Vinh Phuc was one of the first two provinces to be infected with COVID-19. The Vinh Phuc Provincial Field Hospitals, in particular, is regarded as the frontline against the outbreak in the fourth wave of COVID-19 with the multi-variant virus. In order to the present state of COVID-19 disease and update the most recent changes in disease features to assist care and treatment, we conducted a study with the following objectives: *Describe clinical, and subclinical characteristics of patients hospitalized with SARS-COV-2 infection in 3 Field Hospitals, Vinh Phuc Province.*

## II. MATERIALS AND METHODS

### 2.1. Study design and participants

This multiple-centered study, a retrospective was carried out on 1040 patients infected with laboratory-confirmed COVID-19 admitted to 3 Field Hospitals in Vinh Phuc Province, from May 2021 to December 2021.

**2.1.1. Inclusion criteria:** Patients with laboratory-confirmed SARS-CoV-2 virus by reverse transcription polymerase chain reaction (RT-PCR).

**2.1.1. Exclusion criteria:** Patients have incomplete medical records.

### 2.2. Measurements

**2.2.1. Laboratory confirmation:** A confirmed case with SARS-CoV-2 infection was defined as a positive result for RT-PCR assay for pharyngeal swab specimens.

**2.2.2. The Scale of the Disease Severity Assessment:** The severity of SARS-CoV-2 infection in patients at the time of admission was classified according to Decision No. 3416/QD-BYT, dated 14th July 2021, of the Ministry of Health of Vietnam on Guidance on Diagnosis and Treatment of Acute Respiratory Infection Caused by the New Strain of Corona Virus (2019-nCoV) [4].

### 2.3. Data collection and laboratory tests

Demographic characteristics like age, gender, etc., clinical characteristics like symptoms and comorbidities etc, laboratory tests, straight chest X-ray scans, treatment measures, and outcome data were extracted from medical records for each hospitalized patient with laboratory-confirmed COVID-19 by RT-PCR tests. All data underwent a careful check by a group of medical professionals before importing and saving the data into the software.

### 2.4. Statistical analysis

The collected data were managed using Epidata Manager 4.6.0.4 and analyzed using R 3.6.1 Software. No statistical sample size calculation was performed a priori, and the sample size was determined as equal to the number of patients treated during the study period. The categorical variables are presented as frequencies and percentages, whereas the quantitative variables are presented as means and standard deviations in the case that they were normally distributed; otherwise, they

are shown as medians and interquartile ranges (IQRs).

**2.5. Ethical considerations**

Our study has been checked and approved by the ethical committee of medical research of our hospital and Vinh Phuc Department of Health (Ethics

approval number: No.3559/QD-SYT). The consent to participate in the study was not applicable as the study is retrospective. The data provided is solely for research purposes, and to ensure the confidentiality of research participants' identities and personal information.

III. RESULTS

**3.1. Baseline characteristics**

**Table 1. Baseline characteristics of the patients with COVID-19**

<b>Variables</b>	<b>Number (N)</b>	<b>Proportion (%)</b>	<b>Median (IQR)</b>
<b>Age</b>			34 years IQR (18 – 49)
<b>Gender</b>			
Male	523	50.3	
Female	517	49.7	
<b>Comorbidity</b>			
Chronic Obstructive Pulmonary Disease	2	0.2	
Diabetes mellitus	17	1.6	
Hypertension	48	4.6	
Chronic Kidney Disease	1	0.1	
<b>Disease Severity Assessment</b>			
Mild Illness	951	91.5	
Moderate Illness	70	6.7	
Severe Illness	17	1.6	
Critical Illness	2	0.2	

This study included 1040 hospitalized patients with laboratory-confirmed COVID-19. The median (IQR) age was 34 (18-49) years, with 50.3% male, and 49.7% female. It is worth noting that only a minority of the patients presented with comorbidities such as hypertension (4.6%), diabetes (1.6%), COPD (0.2%), and CKD (0.1%). Upon admission, the majority of cases (91.5%) were classified as having mild COVID-19, with only a small proportion were categorized into severe and critical illnesses, respectively.

**Table 2. Signs and symptoms of patients with COVID-19**

<b>Variables</b>	<b>Number (N)</b>	<b>Proportion (%)</b>
Cough	615	60.3
Fever	115	11.3
Muscle fatigue	112	10
Headache	99	9.7
Ageusia	14	1.4
Dyspnea	92	9.0
Sore throat	279	27.3
Diarrhea	37	3.6
Nausea and vomiting	11	1.1
Stomachache	18	1.8

Among the reported symptoms, cough was present in 60.3% of the patients on admission, followed by sore throat (27.3%), fever (11.3%), muscle fatigue (10%), headache (9.7%), and dyspnea (9%).

**Table 3. Vital signs of the COVID-19 patients on admission**

<b>Variables</b>	<b>Median (IQR)</b>
Glasgow on admission	15 (15 – 15)
Heart rate on admission (beats/minute)	90 (80 – 100)
Respiratory rate on admission (beats/minute)	20 (18 – 20)
SPO <sup>2</sup> on admission (%)	98 (97 – 98)
Blood pressure on admission (mmHg)	120/70 (110/70 - 130/80)
Temperature on admission (°C)	37 (37 – 37)

Vital signs were recorded on the day of admission to the hospital for all patients, the results show that almost all patients presented with normal vital signs.

### 3.2. Subclinical characteristics of the patients with COVID-19

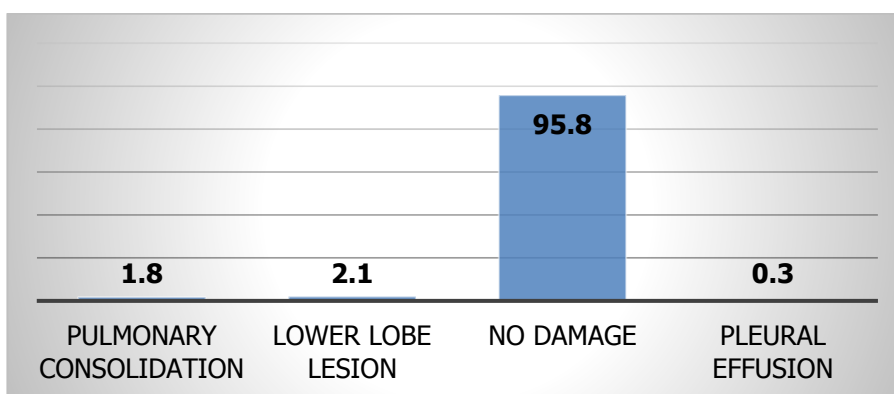
In the majority of cases tested upon admission, the indicators displayed normal results. However, there were a few patients whose Lymphocyte index was found to be below the normal threshold. The laboratory findings of patients upon admission are summarized in Table 4, and Table 5.

**Table 4. Characteristics of CBC and coagulation tests of patients with COVID-19**

<b>Parameter</b>	<b>Median (IQR)</b>
<b>Complete Blood Count Test</b>	
Hemoglobin (g/L)	142 [131 – 152]
RBC (T/L)	4.86 [4.5 – 5.16]
WBC (G/L)	6.2 [4.9 – 7.97]
Lymphocyte (%)	21 [10.4 – 30.4]
Platelet count (G/L)	232 [187 – 286]
<b>Coagulation Test</b>	
Fibrinogen	3 [2.6 – 3.5]

**Table 5. Characteristics of biochemical tests of the patients with COVID-19**

<b>Parameter</b>	<b>Median (IQR)</b>
ALT (U/L)	25 [16.4 – 40]
Creatinin (mmol/L)	76 [61 – 95]
Urease (mmol/L)	4.7 [3.7 – 6.2]
Glucose (mmol/L)	5.5 [4.7 – 7]
CRP (mg/L)	1.5 [0.5 – 4.2]



**Figure 1. Chest X-ray Image findings of patients infected with COVID-19 on admission**

Regarding the results of the straight chest X-ray, the majority of patients exhibit a normal chest X-ray (95.8%), while the most common abnormalities are found in the lower lobes of the lungs (2.1%). Moreover, 1.8% of the patients display evidence of pulmonary consolidation, and 0.3% present with pleural effusion.

**3.2. Main interventions and treatment outcomes**

**Table 6. Treatment and outcomes of patients infected with COVID-19**

Variables	Number (N)	Proportion (%)	Mean ± SD
<b>Treatment</b>			
Antiviral therapy	313	30.1	
Nasal oxygen therapy	96	9.3	
HFNC/NIV	10	0.96	
IMV	3	0.29	
<b>Treatment outcomes</b>			
Discharged from hospital	828	79.6	
Transferred to a higher-level hospital	211	20.3	
Death	1	0.1	
<b>Length of hospital stay</b>			14.2 ± 8.6 days

Abbreviations: IMV: invasive mechanical ventilation, NIV: noninvasive ventilation, HFNC: High-flow nasal cannula.

The majority of cases (30.1%) were treated with antiviral medicines, while nasal oxygen therapy was administered to 9.3% of patients. Only a small proportion of individuals received HFNC/NIV and invasive mechanical ventilation. Regarding treatment outcomes, the majority of patients (79.6%) had been discharged from the hospital, while only one patient deaths reported (0.1%). Among those who were discharged alive, the average length of stay

(LOS) was 14.2±8.6 days, and the mean time from admission to a negative COVID-19 PCR test result was 11.3±5.6 days.

**IV. DISCUSSION**

**4.1. Baseline characteristics**

The investigation conducted on 1040 patients diagnosed with COVID-19 in 3 Field Hospitals in Vinh Phuc Province revealed that the median (IQR) age was 34 (18-49)

years, with a gender ratio of roughly 1:1. By contrast, a study by Argenziano MG et al. (2020) involving 1000 patients suggested that the age group exhibiting the highest prevalence of COVID-19 had a mean age of 63 years (IQR: 50-75), consisting primarily of male individuals (59.6%) [1]. The results of this study also showed that the majority of cases (91.5%, N=951) were classified as having mild COVID-19, with a few cases presented with comorbidities such as COPD (0.2%), diabetes (1.6%), hypertension (4.6%), and CKD (0.1%). Comparison of these results revealed variances in the medical history profiles of the present study in relation to those of Zhan T (2020) and Argenziano MG (2020) [1], [7]. According to the research conducted by Zhan T (2020), a significant proportion of patients (71%) were classified as having severe disease, with 61% of these individuals having a history of at least one chronic disease [7].

Upon admission to the hospital, vital signs were documented for all patients. The findings from this assessment indicate that a vast majority of the patients exhibited vital signs within normal limits.

In the study, respiratory symptoms such as cough (60.3%), sore throat (27.3%), and systemic symptoms like fever (11.3%) and muscle fatigue (10%) were reported. Gastrointestinal symptoms such as stomach ache (1.8%) and vomiting/nausea (1.1%) as well as neurological symptoms like headache (9.7%) were also observed. The studies conducted by Zhan T (2020), Argenziano MG (2020), and Jin-jin Zhang (2020) also revealed the presence of common symptom groups such as cough, fever, and dyspnea. The authors also referred to the symptom groups related to gastrointestinal and neurological issues in their study [8], [1], [7].

#### **4.2. Radiological presentations of the patients with COVID-19**

The laboratory findings of the study participants revealed that the majority of the measured indicators fell within the normal range. Only a few patients exhibited lower Lymphocyte levels than the normal range. This finding aligns with previous research conducted by Jin-Jin Zhang et al. (2020), which demonstrated that some COVID-19 patients also had lymphopenia [8]. The majority of cases did not show any lung damage on chest X-ray, with only 2.1% showing lower lung field involvement. Consolidation (1.8%) and pleural effusion (0.3%) were also present but differed from other studies [8], [7]. A research done by Ting Zhan et al. (2020), there is a significant incidence of lung consolidation (30.9%) and pleural effusion (5.4%) in COVID-19 patients [7].

#### **4.3. Main interventions and treatment outcomes**

The majority of cases (30.1%) were treated with antiviral medicines, while nasal oxygen therapy was administered to 9.3% of patients. Regarding treatment outcomes, the majority of patients (79.6%) had been discharged from the hospital, with 211 (20.3%) patients being transferred to higher-level hospitals, and the incidence of mortality was negligible (0.1%). The average length of stay (LOS) was 14.2 days, and the mean time from admission to a negative COVID-19 PCR test result was 11.3 days. The findings of this study revealed reduced hospitalization durations and lower mortality rates compared to the study by Michael G. Argentiano et al. (2020) showing a long hospital stay (23 days) with 211 mortalities [1]. The high incidence of mild symptoms in our study might explain this finding.

## V. CONCLUSION

Patients with COVID-19 at the Vinh Phuc field hospitals exhibited a wide range of clinical symptoms, with the majority of these patients classified as mild type at the time of admission. Lung damage detected on chest X-rays was identified as a significant prognostic indicator of disease severity. The primary treatment modality involves the administration of antiviral drugs. Most of the patients were successfully discharged from the hospital, with short length of stay.

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