Original Article

Clinical Characteristics, Treatment Outcomes and Experiences Gained in Caring COVID-19 Cases in a Private Hospital in Thailand

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Abstract

OBJECTIVES: To describe clinical characteristics and treatment outcomes and to document adaptation of medical services of COVID-19 cases receiving care at Bangkok Hospital Headquarters (BHQ) from January to May 2020.

MATERIAL AND METHODS: Clinical and laboratory data of confirmed COVID-19 cases were collected using the case record form designed by the clinical team providing care to suspected and confirmed COVID-19 cases. Data were analyzed for clinical characteristics and treatment outcomes. In parallel, the Infection Control Nurse (ICN) team gathered and summarized data on hospital responses, including statistics of hospital staff exposed to COVID-19 cases and their clinical symptoms and test results.

RESULT: From January to May 2020, Bangkok Hospital Headquarters provided COVID-19 screening test using RT-PCR to 2,362 patients, of which 40 (1.69%, 95%CI 1.61%, 1.78%) were positive. Upon diagnosis, two cases wanted to stay in other hospitals. Among 38 cases, the majority (63.0%) had no or mild symptoms, while a quarter (28.9%) had moderate and a few (7.9%) were severely ill. Common symptoms that presented among more than half of the cases were fever (79%), cough (71%), myalgia (58%), rhinitis (55%) and body pain (52%). Anosmia or hyposmia was reported among a third (37%) and ageusia among a quarter (21%). All moderate to severe cases had abnormal chest x-ray on arrival. Focal or patchy infiltration was found among mild to moderate cases. Among advanced or severe cases, chest x-Ray showed bilaterally diffused ground glass infiltration. Compared with asymptomatic or mild symptoms, cases with moderate to severe symptoms had significantly lower neutrophils (p = 0.018) and lymphocytes (p = 0.039) counts. Among 11 moderately ill cases, seven (64%) developed more severe symptoms during admission. In summary, among 38 COVID-19 confirmed cases receiving care in our hospital, half (19/38, 50%) recovered, 15 cases (39.5%) improved, two cases (5.3%) were transferred to other settings and one (2.6%) died.

Hospital's adaptation to the epidemic was in line with national protocols. A "war room" was established and 11 guidelines were created. Responses started from the first week of January 2020 before the first case in Thailand was detected. With strong preventive measures, there was no COVID-19 transmission from patients to health care workers. Among 117 high-risk close contact staff, 27 (23.0%) and 21 of 441 low-risk close contact staff (4.8%) had fever or upper respiratory track symptoms. All of the low-risk close contact staff tested negative for COVID-19 according to national standards set by Department of Disease Control. Only one of 117 high-risk close contact staff tested positive (0.9%). This staff was a computer technician sitting closely with a confirmed case who contracted COVID-19 outside of hospital.

CONCLUSION: Although we were only a small part of the national response, what we learned was meaningful. Clinical and management teams are confident that if another wave of COVID-19 occurs, the hospital will be able to respond immediately using the existing knowledge and experience that was gained.

Keywords: COVID-19, private, Bangkok, Hospital, Thailand, clinical, treatment, outcome

The report of 44 cases of pneumonitis of unknown cause in Wuhan, Hubei Province,[1] People Republic of China to the World Health Organization (WHO) on 31 December 2019 alerted the international community to a new epidemic. Thailand's health authority immediately initiated prevention and control measures on 4 January 2020. WHO officially sent out an alert on 5 January 2020 (Event ID 2020-E000001), which resulted in drawing unprecedented international attention to this epidemic. The causative agent was identified as a novel Corona Virus, and it was named 2019-nCoV for several weeks. To link this with a prior epidemic of Severe Acute Respiratory Syndrome (SARS) two decades ago, WHO officially named the virus as SARS-CoV-2 (SARS Corona Virus 2) and the illness as COVID-19 (Corona Virus Disease 2019) on 11 February 2020.[2] The first set of hospital data from China revealed that a majority (81%) of COVID-19 cases had mild symptoms, while a smaller proportion (14%) had moderate symptoms and around 5% experienced severe symptoms.[3] The first case in Thailand was identified on 13 January 2020[5,6] through the surveillance system of Department of Disease Control, Ministry of Public Health. The number of increasing cases followed the epidemic pattern of an emerging disease. Until 27 May 2020, there have been 3,054 confirmed cases with 57 deaths, 66 in hospital and 2,910 recoveries. The epidemic slowed down in late April 2020 (Figure 1) with 65 of 76 provinces reporting no new cases for four weeks.[6]

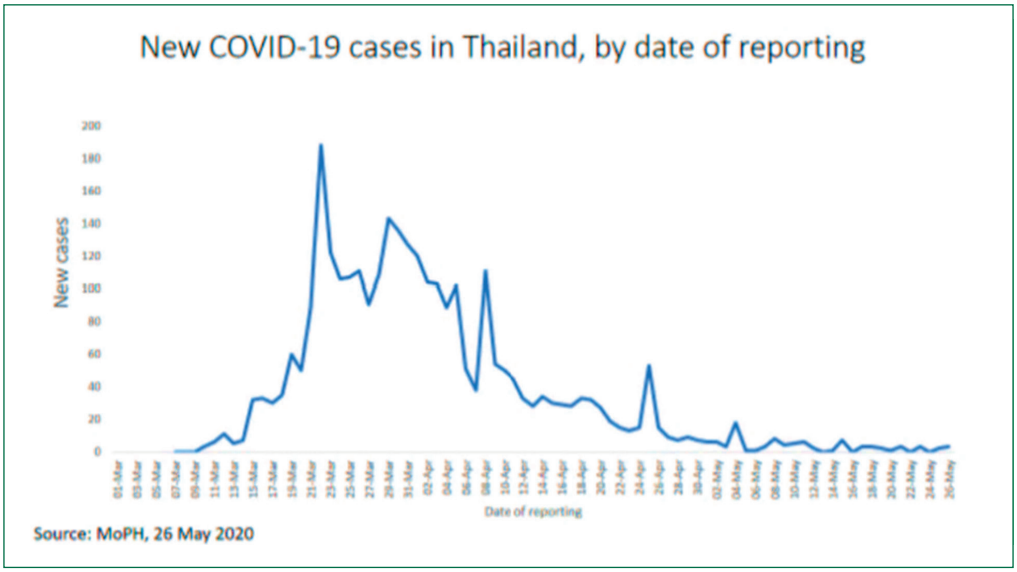

Figure 1: Number of reported COVID-19 cases in Thailand by reported date, as of 27 May 2020

Responding to the epidemic, Bangkok Hospital Headquarters started screening for COVID-19 cases in collaboration with the national health authority on 6 January 2020. Until 15 May 2020, the Hospital had seen 346 patients under investigation (PUI). Among them, 40 were confirmed cases of COVID-19 with clinical and laboratory assessment using Polymerase Chain Reaction (PCR) assay. This paper aims to describe clinical details and share experiences on taking care of these confirmed cases.

Materials and Methods

A case report form (CRF) was developed in line with protocol, and was submitted for permission from hospital management and for ethical clearance from Institutional Review Board. The study received IRB approval number 2020-57. After clearance, the list of confirmed COVID-19 cases was obtained from the Infection Control Nurse (ICN) in charge of COVID-19 case management. The Hospital Numbers of subjects were replaced with subjects' ID numbers by the ICN in charge. Four infectious disease physicians took part in the chart review by completing the CRF with data of patients they took care of. Data were processed and analyzed using STATA version 15.

In compliance with national surveillance protocols, specimens were submitted for RT-PCR tests by the Laboratory Department, Chulalongkorn University and the Department of Medical Science, Ministry of Public Health. Test results were kept and reported according to Hospital's personal data protection policy.

Data on medical care were summarized from ICN notes and verified with data obtained from CRF and relevant medical records.

Clinical characteristics

From January to May 2020, BHQ conducted COVID-19 RT-PCR tests for 2,362 patients, of which 40 (1.69%, 95%CI 1.61%, 1.78%) tested positive. Among 40 confirmed COVID-19 cases identified at Bangkok Hospital Headquarters (BHQ) from January to May 2020, one case was referred for home isolation and the other for social security support. As a result, 38 cases of COVID-19 were included in this study.

Although BHQ initiated the Hospital Emergency Disease alert on 6 January 2020 using the national criteria for

screening of COVID-19 infection, the first case was identified on 26 January 2020. This patient was a 56 year-old Chinese tourist. He came from Wuhan, China, arrived at Chiang Mai International Airport on 21 January 2020. He felt sickness with fever, mild sore throat and body pain about 4-5 days later during his tour to Bangkok. His symptoms persisted for 1-3 days before he sought investigations at BHQ. The COVID-19 RT-PCR was confirmed detected by 2 laboratory centers in Thailand. The last detected case was found on 18 April 2020.

Results

Clinical characteristics of 38 patients are displayed in Table 1. There were 31 (81.6%) males and 7 (18.4%) females. 23 (60.5%) were Thai and 15 (39.5%) were tourists or expats. Of the 15 foreign patients, only 6 were tourists from aboard. About 20% of cases had underlying disease such as hypertension or Type 2 diabetes mellitus (DM).

Table 1: Clinical characteristics of the 38 COVID-19 patients at BHQ, January to May 2020

Health information	n (%)
Sex	
Male	31 (81.6)
Female	7 (18.4)
Thai Nationality	23 (60.5)
Foreigner living in Thailand	9 (23.7)
Tourist	6 (15.8)
Underlying disease (1 or more disease)	
No	30 (79.0)
Yes	8 (21.0)
Hypertension	6 (29)
Diabetes mellitus type 2	3 (14)
Heart Disease	3 (14)
Chronic Kidney Disease	1 (5)
Contacted known case	
No	1 (2.6)
Yes	37 (97.4)
Public Place	11 (29.7)
Epidemic outbreak countries	10 (27.1)
Household	6 (16.2)
Transportation	6 (16.2)
Work place	4 (10.8)
Initial Symptoms	
No	2 (5.3)
Yes	36 (94.7)
Fever	30 (79.0)
Coughing	27 (71.0)
Myalgia	22 (57.9)
Rhinitis	21 (55.3)
Body pain	20 (52.6)
Headache	15 (39.5)
Anosmia / Hyposmia	14 (36.8)
Fatigue	14 (36.8)
Ageusia	8 (21.0)
Dyspnea	7 (18.4)
Diarrhea	3 (7.9)
Other	3 (7.9)

Regarding places where contact occurred, we could identify up to 97.4% (37 from 38) of cases. The most common contact place was a public area (11/37, 29.7%), follow by household area (6/37, 16.2%) and while using transport (6/37, 16.2%) with infected patients. Only four (10.8%) cases reported contracting infection from the workplace.

Almost all of our patients, (36/38, 94.7%) developed clinical illness after being in contact with an infected patient. Only 2 patients respected no clinical illness.

Common presenting symptoms were fever (79.0%), coughing (71%), myalgia (57.9%), URI symptoms (55.3%), diarrhea (7.9%). Anosmia or hyposmia was found up to 36.8%. Patients with dyspneic symptoms and tachypnea indicating moderate to severe illness were 18.4%.

Upon admission, the majority of cases (63.2%) were asymptomatic or had mild symptoms, and their clinical status remained the same until discharge. However, seven of 11 cases who had moderate illness upon admission developed more severe symptoms and one died (Table 2). Regarding co-infection with COVID-19 on admission, there was only one patient, with a co-infection of rhinovirus.

All moderated to severe cases had abnormal chest x-ray on arrival. The abnormal chest x-ray showed focal or patchy infiltration among mild to moderate cases. At advanced or severe illness, chest x-ray showed bilaterally diffused ground glass infiltration.

Laboratory investigations

Routine laboratory investigations were performed, including complete blood count (CBC), blood urea nitrogen (BUN), Creatinine, Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST) and Chest x-ray. Other specific investigations were made according to patients' clinical requirements.

Compare with asymptomatic or mild symptoms, the patient with moderate to severe symptoms showed significantly lower count of PMN ($p = 0.018$) and lymphocytes ($p = 0.039$) (Table 3).

Table 2 : Clinical criteria on admission and discharge

	Initial admission	Discharge
	n (%)	n (%)
Asymptomatic	2 (5.3)	2 (5.3)
Mild	22 (57.9)	22 (57.9)
Moderated illness	11 (28.9)	4 (10.5)
Severe illness	3 (7.9)	10 (26.3)

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Table 3: Complete Blood test results by clinical severity

Variables	Asymptomatic / Mild	Moderate / Severe	*p*
1. Hematocrit (Ref Range:40-54)			0.101
Low	4 (22.2)	7 (50.0)	
Normal	14 (77.8)	7 (50.0)	
High	0 (00.0)	0 (00.0)	
2. Hemoglobin (Ref Range:13-18)			0.400
Low	4 (22.2)	5 (35.7)	
Normal	14 (77.8)	9 (64.3)	
High	0 (00.0)	0 (00.0)	
3. White blood cell (Ref Range:4000-10000)			0.340
Low	1 (05.6)	0 (00.0)	
Normal	17 (94.4)	14 (100.0)	
High	0 (00.0)	0 (00.0)	
4. Platelet Count (Ref Range:150000-450000)			0.370
Low	0 (00.0)	0 (00.0)	
Normal	17 (94.4)	14 (100.0)	
High	1 (05.6)	0 (00.0)	
5. Polymorhonuclear / neutrophils (Ref Range:46.5-75)			0.018*
Low	1 (05.6)	0 (00.0)	
Normal	15 (83.3)	6 (42.9)	
High	2 (11.1)	8 (57.1)	
6. Lymphocyte (Ref Range:12-44)			0.039*
Low	0 (00.0)	3 (21.4)	
Normal	18 (100.0)	22 (78.6)	
High	0 (00.0)	0 (00.0)	

Treatment and outcomes

All COVID-19 patients were admitted to the hospital for quarantine for at least 14 days. Patients with moderate and severe criteria received treatment with 2 or 3 drugs with available medication, including chloroquine, Azithromycin, Lopinavir/ Ritonavir and Favipiravir.

All patients showed clinical improvements except one whose treatment was complicated with respiratory failure, septic shock and severe cytokine syndrome. Table 2 shows the clinical findings of patients on admission and when discharged. From an initial moderate illness criteria, seven then progressed to severe illness during hospitalization (7/11, 63.6%).

On discharge, after 14 days or more of hospitalization quarantine, 50% of cases had improved clinical conditions that could be classified as recovered. Patients with clinical improvement who still had detectable RT-PCR COVID-19 were classified as improved and they were advised to observe quarantine at home for two more weeks.

In summary, among 40 COVID-19 confirmed cases receiving care in our hospital, half (20/38, 53%) recovered, 15 cases (39%) improved, two cases (5%) were transferred to other settings and one (3%) died. (Figure 2)

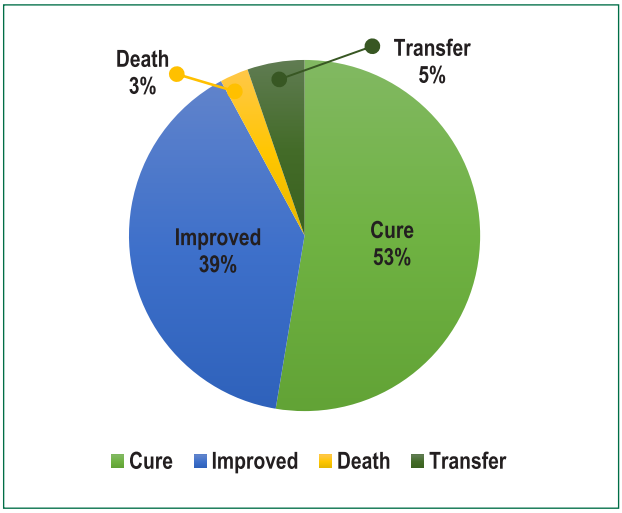

Figure 2: Treatment outcomes of COVID-19 cases, January to August 2020

Hospital adaptation

Hospital management and Infection Control teams closely monitored the COVID-19 epidemic situation since 6 January 2020, less than a week after WHO issued the alert and much earlier than the first case in Thailand was detected on 13 January 2020. Hospital adaptation was in line with

national protocols. A "war room" was established and 11 guidelines were announced in forms or by "Director's orders", which resulted in: a restriction of exits and entrances to the hospital for better temperature and history screening, deployment of hand sanitation gel, stock checking of personal protective equipment (PPE), assignment of acute respiratory infection (ARI) clinic and a cohort ward. Along with infrastructure adjustments, the war room issued standard operating procedures (SOP) for clinical and non-clinical staff regarding hospital infection prevention, personal hygiene and monitoring of possible contacts. Key SOPs include guidelines for surgical operations, admission, referrals, prevention of hospital infection, use of N95 respirators, use of nebulizers, intensive care unit (ICU) procedures, use of personal protective equipment (PPE) and guidelines for visitors. These significantly resulted in excellent infection control. Until this report was made in August 2020, there had been only one (0.2%) in-hospital infection of COVID-19 among 558 staff of the hospital. (Table 5)

Table 5 : Number of clinical and support staff exposed to COVID-19 cases by level of risks, January to August 2020

High risk close contact		Low risk close contact	
Clinical staff	Support staff	Clinical staff	Support staff
74	43	307	134

Hospital staff exposed to COVID-19 cases or specimens or worked in the same vicinity of COVID-19 cases were under surveillance. Among 117 high risk close contact staff, 27 (23.0%) and 21 of 441 low risk close contact staff (4.8%) had fever or upper respiratory track symptoms. All of the low risk close contact staff tested negative for COVID-19 according to national standards set by Department of Disease Control. Only one of 117 high risk close contact staff tested positive (0.9%). This staff was a computer technician sitting closely with a confirmed case who contracted COVID-19 outside of hospital. They spent time together at work and lunch and rarely wore face masks.

Discussions

BHQ, the flagship hospital of Bangkok Dusit Medical Services network, promptly initiated emergency responses, i.e. on 6 January 2020, two days after the health authority of Thailand started the surveillance and one day after WHO had issued the first epidemic alert.

During the early months of the COVID-19 epidemic in Thailand (January to May 2020), the hospital conducted 2,362 RT-PCR tests to screen for COVID-19. Among these, 40 people tested positive, reflecting high attention of both clients and health care workers.

Clinical presentation of this case series corroborated with those reported in other countries,[7-14] including chest x-ray[15] finding. Looking for anosmia as reported and explained since the beginning of the epidemic[16,17] enabled us to detect it among one-third of our cases.

Although we could provide medical services to only a small fraction (38/3054, 1.2%) of confirmed cases during the peak epidemic period in Thailand, our services have been part of a national response to the COVID-19 epidemic of the country. Experience from taking care of 38 patients informed us that in the private sector, the proportion of symptomatic COVID-19 cases might be larger than in the general population. We experienced some clinical progression during hospitalization, which could have been due to natural history of the disease. The third learning was to pay special attention to cases with lymphopenia and abnormal chest x-ray. Cases abnormal chest x-ray and lymphopenia should be hospitalized regardless of clinical appearance as they could turn to moderate or severe symptoms easily. For those with mild symptoms, home quarantine could be a good option. We suggest at least daily phone follow up for them to detect clinical progression.

Overall treatment regimens that were used resulted in similar outcomes as reported by other series at that time. In addition to treatment, we were proud that preventive measures were successful. None of the 138 high and low-risk staff who provided clinical services to confirmed COVID-19 cases were infected by patients. The only one COVID-19 transmission in the hospital occurred outside of clinical services.

Thailand has been praised for having performed well in the prevention and control of the COVID-19 epidemic and it is undeniable that services in the private sector is part of that. If a second wave or another epidemic of similar transmission routes occurs in Thailand, we will be able to put our responses into effect even faster.

Conclusions

In the first half of 2020, during the peak of the epidemic of COVID-19 in Thailand, BHQ provided RT-PCR laboratory screening to 2,362 clients. Among them, 40 (1.69%, 95%CI 1.61%, 1.78%) tested positive. Two cases were referred out upon request of the patients. Among 38 confirmed cases of COVID-19 receiving care between January and May 2020, half (19/38, 50%) recovered, 15 cases (39.5%) improved, two cases (5.3%) were transferred to other settings and one (2.6%) died. Commonly presented symptoms were fever (79.0%), coughing (71%), myalgia (57.9%), URI symptoms (55.3%), diarrhea (7.9%). Anosmia or hyposmia was found up to 36.8%. Patients with dyspneic symptoms and tachypnea which indicate moderate to severe illness were found in about 18.4%. Laboratory assessment showed significantly lower PMN ($p = 0.019$) and lymphocyte ($p = 0.039$) counts among moderate to severe cases in comparison with cases with asymptomatic or mild symptoms. Hospital adaptation was initiated very early and responses were harmonized for both clinical services and infection prevention. As a result, there was no clinically hospital acquired infections among 138 high and low-risk

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clinical staff. One infection occurred in the back office, where an IT person contracted COVID-19 from outside and transmitted it to his colleague. However, there was no further infection because control measures were implemented immediately. With knowledge and experience gained during the peak of the COVID-19 epidemic in Thailand, Bangkok Hospital Headquarters teams are better prepared for a second wave or another similar epidemic with confidence that subsequent responses of the hospital will be fast and effective.

Conflict of Interest

The authors declared no conflict of interest with hospital business and none of the authors had any connection with marketing activities.

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