SHORT COMMUNICATION

COVID-19 detected from targeted contact tracing, attempting to see the pattern in random happenings: early lessons in Malaysia

Boon Hau Ng, MMed[1], Andrea Ban Yu-Lin, MMed[1], Nik Nuratiqah Nik Abeed, MMed[1], Mohamed Faisal Abdul Hamid, MMed[1], Chun Ian Soo, MRCP[1], Najma Kori, MMed[2], Petrick Periyasamy, MMed[2]

[1]Respiratory Unit, Department of Internal Medicine, Hospital Canselor Tuanku Muhriz, Pusat Perubatan Universiti Kebangsaan Malaysia, [2]Infectious Disease Unit, Department of Internal Medicine, Hospital Canselor Tuanku Muhriz, Pusat Perubatan Universiti Kebangsaan Malaysia

SUMMARY

The world feels strange as we face what is for most of us our first ever pandemic. The number of newly diagnosed cases rises daily in many parts of the world, and we are faced with the reality that there are still many things to learn about this new disease. We share here our experience of treating our first 199 COVID-19 patients in the Hospital Canselor Tuanku Muhriz, Pusat Perubatan Universiti Kebangsaan Malaysia (PPUKM).

KEYWORDS:
COVID-19, SARS-CoV-2, delayed clearance

The first confirmed case of coronavirus disease 2019 (COVID-19) in Malaysia was imported from China on the 25th of January 2020. We report this retrospective observational series of the first 199 consecutive patients with COVID-19 admitted to the Hospital Canselor Tuanku Muhriz, Pusat Perubatan Universiti Kebangsaan Malaysia (PPUKM) from 18 March to 25th of April, 2020. We included those confirmed with COVID-19 by SARS-CoV-2 real-time reverse transcriptase–polymerase chain reaction (rRT-PCR) of nasopharyngeal and oropharyngeal swab. The swabs were done using the recommended standard operating procedure. The median age of the patients was 28 years (range, 10-84) and 152 (76.38%) were men. Hypertension was the commonest comorbidity 21 (10.55%) followed by diabetes 11 (5.52%). There were no patients with chronic obstructive pulmonary disease. Majority of the patients (98%) were identified based on the risk of contact by the ministry of health Malaysia via targeted contact tracing. Once identified as positive COVID-19, these patients were admitted to PPUKM for further care. Most cases were asymptomatic (67.83%) and detected by targeted contact tracing. There were 11 active smokers and five ex-smokers in this group. The most common comorbidity in the asymptomatic group was hypertension 13 (9.63%) followed by diabetes, 7 (5.19%). The most common symptoms on admission were fever (48%) and cough (47%). Anosmia (6.25%) and diarrhoea was uncommon (3.13%). Other non-specific symptoms were myalgia, arthralgia, headache, and lethargy. (Table I)

Majority of the patients had normal absolute lymphocytes count (mean±SD; 2.38±0.81x10^9/L), absolute monocytes count (0.66±0.54x10^9/L) and platelet count (280.57±73.16x10^9/L). Twenty-six patients had elevated C-reactive protein of >0.5mg/dL and 72 patients had elevated lactate dehydrogenase of >220U/L.

Fourteen out of 43 patients who underwent high resolution computed tomography (HRCT) thorax had abnormal findings. All fourteen (100%) had ground glass opacification, 4 (28.57%) had consolidation and 4 (28.57%) had crazy paving pattern. Peripheral distribution of the HRCT abnormalities accounted for 64%. The pattern of lobar distribution was right upper lobe: 42.85%; right middle lobe: 21.43%; right lower lobe: 28.57%; left upper lobe: 64.29%; left lower lobe: 28.57%. We found the predominant distribution of both upper and lower lobes. Our findings differ from other reported findings of predilection of the lower lobes.[1]

Majority, 189 (94.97%) of our patients had early viral clearance which is consistent with another reported study.[2] Ten patients remained persistently positive beyond day-10. Repeated swabs showed a variety of patterns of persistence (Table II). The longest duration of persistent positive result was 28 days. Our results are consistent with other studies, where up to 90% of cases had viral clearance at day-10. Increasing age, male gender, hypertension have been reported to affect viral clearance.[3] Our study found symptomatic patients to have longer duration of viral shedding. We postulate that the presence of symptoms in COVID-19 patients may be used as a predictor of viral shedding. Resolution of symptoms may be used as a criterion for discharge.

At this stage of the pandemic, the recommendation was to discharge patients only when there was a confirmed presence of clearance of the virus. In Malaysia, the recommendation criteria for discharge of patients from isolation was two negative swabs 14 days apart. The World Health Organization (WHO) has since amended their guidelines as of 17th June 2020 and the current criteria for discharge does not require re-testing. The current recommendation for symptomatic patients is 10 days after onset of symptom, plus

This article was accepted: 28 July 2020
Corresponding Author: Dr. Andrea Ban Yu-Lin
Email: andreaban@gmail.com

Table I: Demographics and clinical characteristics of COVID-19 patients detected from targeted screening admitted to PPUKM

Characteristic	All Patients (n=199)
Median age (IQR)	28 (21.5)
Male, n (%)	152 (76.38)
Malaysian, n (%)	138 (69.34)
Non-Malaysian, n (%)	61 (30.66)
Asthma, n (%)	2 (1)
Chronic obstructive pulmonary disease, n (%)	0
Hypertension, n (%)	21 (10.55)
Diabetes mellitus, n (%)	11 (5.52)
Coronary artery disease, n (%)	5 (2.51)
Obesity, n (%)	4 (2)
MEWS, mean (SD)	0.92 (0.58)
Systolic blood pressure(mmHg), mean (SD)	131.44 (15.75)
Diastolic blood pressure (mmHg), mean (SD)	81.10 (12.87)
Heart rate (beats per minute), mean (SD)	87.47 (13.98)
Temperature (degree Celcius), mean (SD)	37.04 (0.43)
Respiratory rate (breaths/min), mean (SD)	16.84 (2.65)
SpO2, mean (SD)	97.40 (8.96)
Outcome	
Death, n (%)	1 (0.5)
Discharged, n (%)	198 (99.5)
Symptomatic patients, n(%)=64(32.16)	
Fever, n (%)	31 (48)
Cough, n (%)	30 (47)
Sore throat, n (%)	12 (19)
Rhinitis, n (%)	7 (11)
Anosmia, n (%)	4 (6)
Diarrhoea, n (%)	2 (3)
Shortness of breath, n (%)	3 (5)
Myalgia, n (%)	6 (9)
Arthralgia, n (%)	3 (5)
Headache, n (%)	4 (6)
Lethargy, n (%)	1 (1.5)
Epigastric pain, n (%)	1 (1.5)
Source of admission	
Emergency department visit, n (%)	4(2)
Targeted contact tracing, n (%)	195(98)
Type of contact, n (%)	
"Tabligh" cluster, n (%)	46(23)
Malaysians returning from overseas, n (%)	27(14)
Local clusters, n (%)	60(30)
Contact with positive COVID-19 patients, n (%)	47(24)
No identifiable source of contact, n (%)	19(9)

Notes: MEWS=Modified Early Warning Score assess the risks of clinical deterioration and identifies patients who require intensive unit or high dependency care with admission to an intensive care unit or high dependency unit.

Table II: Patients who tested positive at day-10, demographics, symptoms and the pattern of subsequent results

No	Age (years)	Sex	Comorbidities	Symptoms	Day-10	Day-13	Repeated results
Patient 1	33	F	Nil	Nil	Pos	Ind	D16 Ind, D19 Neg
Patient 2	22	M	Nil	Nil	Pos	Ind	D15 Neg
Patient 3	38	F	Nil	Anosmia	Pos	Ind	D15 Pos, D18 Pos, D21 Pos, D24 Pos, D27 Neg, D28 Pos
Patient 4	57	M	Hypertension	Nil	Pos	Neg	Nil
Patient 5	52	F	Nil	Nil	Pos	Neg	Nil
Patient 6	36	F	Nil	Sore throat	Pos	Ind	D16 Ind, D19 Pos, D21 Pos
Patient 7	19	M	Nil	Nil	Pos	Pos	D15 Neg, D16 Neg
Patient 8	19	F	Nil	Nil	Pos	Neg	Nil
Patient 9	45	M	Nil	Fever	Pos	Ind	D16 Pos, D18 Ind
Patient 10	43	M	NIl	Nil	Pos	Neg	D14 Pos

Notes: Ind:I ndeterminate; Pos: positive; Neg: negative; D: day; M: male; F:female.

at least three additional days without symptoms (including without fever and without respiratory symptoms). For asymptomatic cases: 10 days after positive test for SARS-CoV-2.

Active viral shedding has been reported to occur even in patients with mild symptoms. This peaks at day-5 and continues up to two weeks. Seroconversion occurs in almost all patients at day-14 but this is not followed by decline of the viral load.[4] A case series has reported asymptomatic COVID-19 patients to have radiological computed-tomography changes of peripheral ground glass opacification(GGO) with upper or lower lobe predominance.[5]

This study highlights the drawback in the strategy to control the spread of this disease. It reinforces what we currently know that traditional symptom-based case detection may not be enough to detect COVID-19 cases. It also highlights that persistence of symptoms may be associated with prolonged viral shedding. The ultimate defeat of COVID-19 would require a combination of use of face masks, social distancing, and a strategy to increase testing capacity.

ACKNOWLEDGEMENT

This study was approved by the UKM ethics committee with the project code: FF-2020-358

We have read and understood MJM policy on declaration of interests and declare that we have no competing interests.

REFERENCES

1. Salehi S, Abedi A, Balakrishnan S, Gholamrezanezhad A. Coronavirus Disease 2019 (COVID-19): A Systematic Review of Imaging Findings in 919 Patients. AJR Am J Roentgenol. 2020: 215(1): 87-93.
2. Liu Y, Yan LM, Wan L, Xiang TX, Le A, Liu JM, et al. Viral dynamics in mild and severe cases of COVID-19. Lancet Infect Dis 2020; 20(6): 656-7.
3. Chen X, Hu W, Ling J, Mo P, Zhang Y, Jiang Q, et al. Hypertension and Diabetes Delay the Viral Clearance in COVID-19 Patients. medRxiv. 2020.
4. Wölfel R, Corman VM, Guggemos W, Seilmaier M, Zange S, Müller MA, et al. Virological assessment of hospitalized patients with COVID-2019. Nature 2020; 581(7809): 465-9.
5. Ng BH, Nik Abeed NN, Abdul Hamid MF, Soo CI, Low HJ, Ban YL. What happens when we treat the "Typhoid Mary" of COVID-19. Respirology case reports 2020; 8(6): e00604.