MORBIDITY AND MORTALITY OUTCOMES FOR PATIENTS WITH MODERATE-TO-SEVERE COVID-19 DISEASES: A POST-HOSPITALIZATION FOLLOW-UP STUDY

C.P. Hor[1,2], L.K. Teo[3], H.X. Wang[1], Y.J. Teoh[4], T.L. Chong[1], C.H. Yen[5], N. Abdul Mutalib[6], J.T. Cheng[1]

[1]Kepala Batas Hospital, Dept of Medicine, Penang, Malaysia
[2]Seberang Jaya Hospital, Clinical Research Centre, Penang, Malaysia
[3]Pulau Pinang Hospital, Clinical Research Centre, Penang, Malaysia
[4]Kepala Batas Hospital, Dept of Pharmacy, Penang, Malaysia
[5]Queen Elizabeth II Hospital, Clinical Research Centre, Sabah, Malaysia
[6]Kepala Batas Hospital, Health Management Unit, Penang, Malaysia

PURPOSE

The burden of post-COVID-related morbidity and mortality is significant yet understudied.

We studied the morbidity and mortality outcomes of COVID-19 patients with moderate-to-severe diseases by 90-day post-hospitalization.

METHODS & MATERIALS

This retrospective cohort study included 510 COVID-19 patients admitted to Kepala Batas Hospital with moderate- to-severe diseases during Delta wave, who required oxygen therapy during hospitalization (Malaysia COVID-19 severity category ≥4; WHO scale ≥5), between January 1st and August 31st 2021. An additional 369 patients were uncontactable for follow-up and excluded from this study. Our hospital was the designated COVID-19 hospital covering over 1 million populations in mainland of Penang state, and borders of Kedah and Perak states.

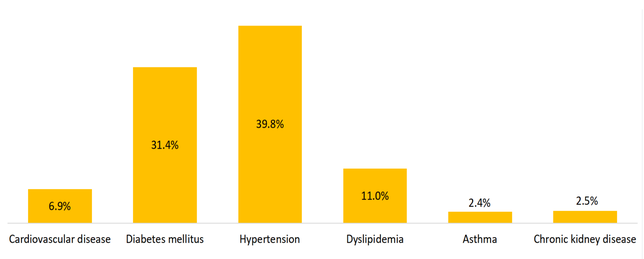
We followed up COVID-19 survivors with telephone surveillances by 90 days post-discharge from our hospital, assessing post-COVID follow-up, development of complications and mortality. Relevant clinical data were extracted from medical records. Multiple logistic regression was employed to examine factors associated with post-COVID mortality after index hospitalization.

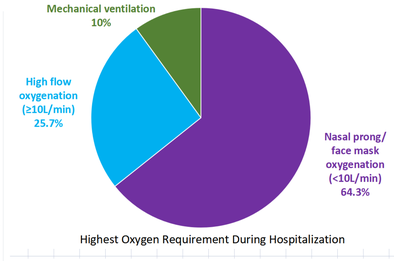
We obtained ethics approval from Medical Research and Ethics Committee, Ministry of Health (NMRR ID-22-00396-VNS (IIR)). We performed the data analysis using SPSS version 23.0.

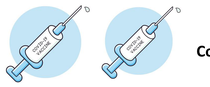
Kementerian Kesihatan Malaysia

ISID INTERNATIONAL CONGRESS ON INFECTIOUS DISEASES

Among 510 COVID-19 patients with moderate-to-severe diseases (Delta wave)



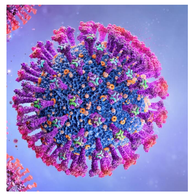




Complete vaccination 4.9%

Partial vaccination 15.5%

23.3%



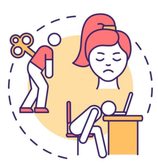
After discharge from hospital, within 90 days

87% attended post-COVID follow-up clinic

8.5% re-hospitalized (≥ 1)

13.5% died

25.9% reported residual symptoms



14.5% Lethargy

12.2% Dyspnoea

7.5% Hair loss

6.3% Memory loss

3.9% Bodily pain

3.9% Depression

2.7% Anxiety

1.6% Home oxygen

RESULTS

Table 1: Demographics of COVID-19 patients with moderate-to-severe diseases (n=510)

Variables		n(%)
Age, years, mean (SD)		52.1(14.65)
Status		
	Survivor	441(86.5)
	Death	69(13.5)
Gender		
	Male	260(51.0)
	Female	250(49.0)
Ethnicity		
	Chinese	120(24.5)
	Malay	306(60.0)
	Indian	59(11.6)
	Non-citizen	20(3.9)

Table 2: Factors associated with 90-day mortality post-hospitalization

Factors	**Overall** (n=510)	**Survivor** (n=441) n(%)	**Death** (n=69)	***p*-value**
Age				<0.001
<60	360(70.6)	335(76.0)	25(36.2)	
≥60	150(29.4)	106(24.0)	44(63.8)	
Gender				0.637
Male	260 (51.0)	223(50.6)	37(53.6)	
Female	250 (49.0)	218(49.4)	32(46.4)	
Oxygen requirement				<0.001
Low (< 10L/min)	328(64.3)	308(69.8)	20(29.0)	
High (≥10L/min)	182(35.7)	133(30.2)	49(71.0)	
Ventilation status				<0.001
Non-mechanical ventilated	459(90.0)	423(95.9)	36(52.2)	
Mechanical ventilated	51(10.0)	18(4.1)	33(47.8)	
Co-morbids				
Hypertension	203(39.8)	163(37.0)	40(58.0)	0.001
Diabetes mellitus	160(31.4)	127(28.8)	33(47.8)	0.002
Dyslipidemia	56(11.0)	44(10.0)	12(17.4)	0.071
Cardiovascular disease	35 (6.9)	25(5.7)	10(14.5)	0.009
Chronic kidney disease	13(2.5)	10(2.3)	3(4.3)	0.371
Asthma	12(2.4)	10(2.3)	2(2.9)	0.748
End stage renal failure	3(0.6)	2(0.5)	1(1.4)	0.341
Chronic lung disease	4(0.8)	4(0.9)	0(0.0)	>0.99

Adjusted for gender, comorbids and ventilatory status,age ≥60 years (aOR 7.96; 95%CI 3.75-16.92; p<0.001), diabetes (aOR 2.30; 95%CI 1.12-4.72; p=0.024), and high oxygen requirement (aOR 3.41; 95%CI 1.56-7.46; p=0.002), were associated with increased 90-day post-COVID mortality.

CONCLUSION

Post-COVID morbidity and mortality are significant among survivors hospitalized for moderate-to-severe diseases. Comprehensive post-COVID care must be addressed to improve the patients' outcomes.

ACKNOWLEDGEMENT

We sincerely thank all the healthcare workers, patients and their family.

REFERENCES

1. Huang, C. *et al.*, 6-month consequences of COVID-19 in patients discharged from hospital: a cohort study. The Lancet, 2021. 397(10270): p. 220-232.
2. Uyaroglu, O.A *et al.*, Thirty-day readmission rate of COVID-19 patients discharged from a tertiary care university hospital in Turkey: an observational, single-center study. 2020.
3.Ayoubkhani, D. *et al.*, Post-covid syndrome in individuals admitted to hospital with covid-19: retrospective cohort study. bmj, 2021. 372.
4.Chopra, V. *et al.*, Sixty-day outcomes among patients hospitalized with COVID-19. Annals of Internal Medicine, 2021. 174(4): p. 576-578.