Extended Monitoring of Immunosuppressed COVID 19 (Omicron variant) Patients for Late Respiratory Deterioration: Is This Required?

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Introduction

The covid-19 virtual ward (CVW) was introduced as part of a public health strategy in a Queensland hospital with the aim to provide care to patients with mild to moderate covid-19 infection at home. This was through telehealth-based monitoring and the delivery of relevant therapeutics and inhalers for eligible patients according to the Australian therapeutic guidelines and recommendation at the time of dispensing. Additionally, as of March 24, 2022, an extended monitoring criteria (EMC) cohort was initiated to more closely monitor high risk patients for an extended 14 day period. This 14-day model was developed from morbidity and mortality data of the previous delta wave variant which showed that high risk patients had a higher rate of developing ARDS, typically around day 8-9 of infection. The high risk cohort were defined by a set of inclusion criteria as shown in table 1.

COVID-19 ARDS is defined when a confirmed COVID-19 infection also meets the Berlin 2012 ARDS diagnostic criteria; (i) acute hypoxaeic respiratory failure; (ii) presentation within 1 week of worsening respiratory symptoms; (iii) bilateral airspace disease on chest x-ray, computed tomography (CT) or ultrasound that is not fully explained by effusions, lobar or lung collapse, or nodules; and (iv) cardiac failure is not the primary cause of acute hypoxaemic respiratory failure.[1]

This is an analysis of the EMC to identify whether the extended 14 day monitoring period was useful for monitoring progression of covid-19 disease in the high risk patient subgroup.

Inclusion criteria for EMC:
▪ Immunosuppressive therapy for GVHD (cyclosporin, tacrolimus, mycophenolate, ruxolitinib)
▪ T cell depleting therapy within the last 12 months (alemtuzumab)
▪ B cell depleting therapy in combination with chemotherapy currently or within the last 6 months
▪ Allogeneic stem cell transplant within the last 12 months
▪ High dose cyclophosphamide (>1g/m2) in the last 12 months
▪ EVUSHELD within the last 6 months
▪ CAR-T/NK Immunotherapy within the last 12 months
▪ Other haematological malignancy on active therapy
▪ Solid organ transplant on immunosuppressive therapy – lung transplant or liver transplant any time frame, other SOT within 1 year of transplant
▪ Autologous stem cell transplant within the last 6 months
▪ BTK inhibitors
▪ Severe combined immunodeficiency syndrome

Table 1: Inclusion criteria for high risk cohort

Method

This is a retrospective cohort study over a 4 month period (February 1 until May 31, 2022). A set of inclusion criteria was developed for the EMC. These patients were reviewed clinically daily by phone call from a medical professional and disease progression was assessed using the compass score tool (table 2).

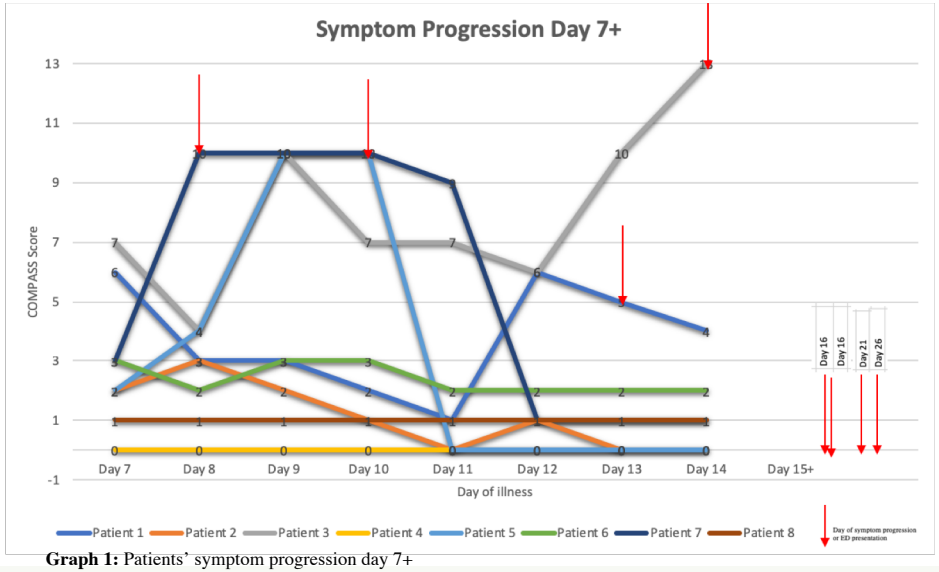
The main outcomes assessed included; length and nature of covid-19 related symptoms; death within 30 days, hospital admission or emergency department (ED) presentation within 30 days and requirement for re-treatment with additional therapeutics.

Symptom	SCORE		
Chest pain	(0) No (3) Yes	Shortness of Breath	(0) None OR RR 12-20 (1) On walking across the room OR RR 21-24 (2) On arising from a chair OR RR 25-29 (3) Unable to complete sentences OR RR >30
Collapse or dizziness on standing	(0) No (3) Yes	Change in Shortness of Breath	(0) Same or better than yesterday (1) Worse today (2) Worse within the last hour
Cold or clammy or mottled skin	(0) No (3) Yes	Cough	(0) No (1) Dry cough (2) Cough with sputum
Confusion or altered level of consciousness	(0) No (3) Yes	Fatigue	(0) None (1) Noticeable (2) Struggling to get out of bed (3) Unable to speak
Vitals (if patient has been given pulse oximeter): HR >100 or Sats <95% (rest or exertion)	(0) No (3) Yes	Fever	(0) Afebrile (1) Febrile 38-39 OR fevers + chills (2) Febrile >39 OR uncontrollable shivering
Diarrhoea/Vomiting	(0) No (1) Yes (2) Yes (greater than 4 times per day)	Myalgia	(0) None or mild (1) Severe

Table 1: The Compass Score

Results

A total of 51 patients met criteria. 96.1% received initial therapeutics initiated by the CVW. The median duration of symptoms was 11.8 days and the median length of stay was 13.2 days. 15.6% (n=8) showed symptom progression, half of which (n=4) progressed after 7 days and half (n=4) after 14 days (graph 1). Of the resultant presentations to emergency, 3 were outside the 14 day monitoring window and 4 within the 14 days monitoring window. 4/7 patients self presented without assistance by the VW ie. did not use the hot line as symptoms progressed, but presented directly to ED. There were 0 covid-related deaths



Graph 1: Patients' symptom progression day 7+

Innovation & Significance

This is the first review of the usefulness of the newly introduced EMC to the covid-19 virtual ward model. Only a small percentage of patients of the high risk group became worse in symptomology after 7 days. 43 patients (84.3%) were monitored over this time without later progression of symptoms after day 7. Given that, of the 13.7% of patients that required ED presentation, more than half self-referred n=4 and 57.1%. In addition 50% (n=4) of the patients that showed disease progression, presented after the 14 day window.

In comparison with the delta wave data available, previous reports showed development of ARDS was predictable at day 8-9, or a median time of 8.5 days to intubation.[2,3] In this study, it can be seen that the omicron variant is not as predictable, given the wide variation in time to symptom progression (day 7 to 26) in this small group of high risk patients.

Currently the relative 'cost' for the EMC involved an initial phone call from a doctor followed by daily phone calls from a medical professional and consultation with pharmacists, couriers and an administration team. Given the high self-referral rate in this small cohort, this raises the question of whether appropriate health education avenues would yield similar results in this particular outcome measure.