

Review Article

Discharge Dilemma: COVID 19 Positive Patients from Hospital

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Abstract

COVID 19 pandemic started as cluster of unexplained Pneumonia in Wuhan, China. More than 5 million cases have been reported so far. The disease process is variable, poorly understood and is evolving. It is highly infectious and main mode of transmission is person to person. Therefore, stringent public health measures have been in place such as social distancing, personal and hand hygiene, lockdown strategies etc to minimise the transmission. In hospital medicine, safe discharge and arranging a follow up of COVID positive patient poses a challenge and currently there are no clear guidelines available due to uncertainty of infectivity in patients (both immune competent and immune compromised). Safe discharging is very essential to restrict further cluster and outbreak of COVID19 in community.

Why is Safe Discharging Important? Infectivity and Transmission

WHO mission to China report mentioned that SARS-CoV-2 virus can be detected 1-2 days prior to onset of symptoms in nasal-opharyngeal samples, can persist for 7-12 days in moderate cases and up to 2 weeks in severe cases [1]. Viral RNA is also detectable in faeces 4-5 weeks after symptom onset in approximately 30% of cases; however its clinical significance is not known [1]. In Singapore, prolonged viral shedding from upper airway aspirates was reported and in some cases up to at least 24 days after the onset of symptoms [2]. Transmission of SARS-CoV-2 from asymptomatic individuals (or individuals within the incubation period) has also been well documented [3].

Zou et al reported that viral load is similar in both symptomatic and asymptomatic groups. Patients with no or modest symptoms had detectable viral RNA for at least 5 days indicating risk of transmission from asymptomatic patients [4].

The biologic basis for this is supported by a study of a SARS-CoV-2 outbreak in a long-term care facility, in which infectious virus was cultured from reverse transcription polymerase chain reaction (RT-PCR)-positive upper respiratory tract specimens in pre-symptomatic and asymptomatic patients as early as six days prior to the development of typical symptoms [5]. There is no data or study to determine the longest documented transmission from an asymptomatic person. Viral RNA can persist over long periods of time in bodily fluids. This does not necessarily mean that the person is still infectious. Isolation of viruses in virus culture is needed to show infectivity. Based on the data obtained it is uncertain to determine when exactly the patient will be non-infective and if precautions are not placed can lead to further outbreaks in community, which can lead to further burden on health care facilities.

Clinical Problem

Suspected and positive COVID-19 patients attending hospitals are isolated as per clear pathways and all necessary precautions are taken with appropriate PPE. Some patients have mild respiratory compromise with normal radiographs, some have bilateral infiltrates and some are intubated and ventilated in ICU/HDU. Some patients were admitted for other medical conditions in hospital and were screened for concerns (exposure to COVID patients or clinical concerns) and were positive.

The varied presentation, spectrum and uncertainty about the illness pose a clinical challenge to arrange a safe discharge and follow up. Some of the challenges faced by our COVID team at time of discharge of COVID patient when medically fit, stable or do not need any intervention in hospital are:

- When do you discharge COVID positive patients?
- Where do you discharge the patients? e.g in clinical situations where an elderly patient living on their own or with little support who lost mobility due to recent bilateral pneumonia/significant illness or patient who are clinically very well but have a family member at home who is immunocompromised?
- When do the patients become clear of infection?
- Is the onset of symptom history from patient reliable or the reference point should be when they were positive?
- Do COVID positive patients need any follow up?
- When do you re-image them if they had infiltrates?
- Do they need any formal respiratory follow up and is there a need of lung function testing?

- If the patients develop any new symptoms after discharge and are presumed to be non-infective as per current guidelines and re-present to the hospital, should they be isolated and retested because that can potentially expose other admitted patients?
- If the repeat swab or re-presentation to hospital is negative, is one negative swab enough to admit them in a general ward?
- What about immunocompromised, and patients with persistently positive swabs? Is their infectivity similar to the immunocompetent patients?

Current Clinical Guidelines for De-isolation of COVID-19 Cases

COVID-19 patients discharge planning is done by taking into account the existing capacity of healthcare, laboratory and diagnostic resources and the epidemiological situation at the time of discharge in that particular area. Some of the current clinical guidelines for de-isolation are:

- 1) *Ministero della salute, Consiglio Superiore di Sanità, Italy* (28 February 2020) - A COVID-19 patient can be considered cured after the resolution of symptoms and 2 negative tests for SARS-CoV-2 at 24-hour intervals. For patients who clinically recover earlier than 7 days after onset, an interval of 7 days between the first and the final test is advised.
- 2) *CDC USA* (Interim guidance) - Negative rT-PCR results from at least 2 consecutive sets of nasopharyngeal and throat swabs collected ≥ 24 hours apart from a patient with COVID-19 (a total of four negative specimens) and resolution of fever, without use of antipyretic medication, improvement in illness signs and symptoms.
- 3) *CHINA CDC* - Patients meeting the following criteria can be discharged: Afebrile for >3 days, Improved respiratory symptoms, pulmonary imaging shows obvious absorption of inflammation, and nucleic acid tests negative for respiratory tract pathogen twice consecutively (sampling interval ≥ 24 hours).

After discharge, patients are recommended to continue 14 days of isolation management and health monitoring, wear a mask, live in a single room with good ventilation, reduce close contact with family members, eat separately, keep hands clean and avoid outdoor activities. It is recommended that discharged patients should have follow-up visits after 2 and 4 weeks.

- 4) *European Centre of Disease Prevention and Control Guidelines*:
 - Clinical criteria (e.g. no fever for > 3 days, improved respiratory symptoms, pulmonary imaging showing obvious absorption of inflammation, no hospital care needed for other pathology, clinician assessment)
 - Laboratory evidence of SARS-CoV-2 clearance in respiratory samples; 2 to 4 negative RT-PCR tests for respiratory tract samples (nasopharynx and throat swabs with sampling

interval ≥ 24 hours). Testing at a minimum of 7 days after the first positive RT-PCR test is recommended for patients that clinically improve earlier.

- Serology: appearance of specific IgG when an appropriate serological test is available.

Recommendations

Our suggestion is to classify patients who are deemed suitable for discharge from hospital, into mild, moderate and severe category based on certain clinical and radiological features. Our suggestion is to discharge patients to home or convalescent facility depending on patient's physical, functional and home situation.

Mild Cases

Patients with no radiographic abnormalities and patient who did not require supplemental oxygen or had exercise induced desaturation to be classified as mild cases prior to discharge.

Moderate Cases

Patients with infiltrates or abnormalities on imaging requiring supplemental oxygen, who do not have significant co-morbid condition and good functional baseline, who did not require assisted ventilation can be classed as Moderate Cases prior to discharge.

Severe Cases

Patients, who had severe illness requiring NIV/High Flow Nasal Cannula/Mechanical Ventilation or had significant co-morbid conditions, or have had decline in functional capacity due to severe illness, would be classified as Severe Cases of COVID infection.

A discharge for mild cases may be considered to home if patient can isolate himself at home (e.g. single room with good ventilation, face-mask wear, reduced close contact with family members, separate meals, good hand sanitation, no outdoor activities) with follow up phone calls by specially designated health care provider due to the risk of worsening of the clinical symptoms, keeping in view the delayed onset of cytokine storm.

Moderate cases may be discharged home if they can self isolate and they are provided with Pulse oximeters and thermometers for home monitoring for further 7 days. They should be linked in with specially designated clinical nurse specialist for twice daily monitoring of symptoms and recording parameters. If patients are technology savvy and able to update symptoms and parameters on App either on Smartphone or computer, an App can be designed for maintain data of such patients and monitored centrally.

In severe cases that have experienced functional decline in terms of mobility, cognition and activities of daily living should be discharged to step-down facility with rehabilitation and multidisciplinary facility (physiotherapy, occupational therapy, pulmonary rehabilitation and geriatrician input). If the patient is not able to self-isolate due to reasons such as living in accommodation with multiple people, hostel or with immunocompromised and elderly population discharge to step down/convalescent facility specially designated for similar cases should be considered to minimise cluster of infections.

COVID positive patients who had infiltrates/pneumonia or opacification on chest radiograph should have a follow up imaging to look for resolution. The timing of repeat imaging is uncertain due to the phenomenon of viral shedding and unclear infectivity of the disease. Our suggestion would be to repeat radiography 8 weeks after the onset of symptoms as viral shedding has not been observed after 6 weeks.

Current evidence suggesting viral shedding in bodily fluids for 6 weeks makes de-isolation decision difficult. At present, de-isolation guidance are unclear with a lot of institutional variability. The timeframe for de-isolation can only be provided after robust clinical trials exploring the infectivity of viral shedding in the bodily fluids to avoid clustering and re-infection. Antibody testing seems to be of benefit in cases that are immunocompromised or were COVID positive for prolonged duration. Patients who were immunocompromised or remained COVID positive on re-swabbing should be isolated on the side of precaution if they re-present to the hospital with a different medical problem.

A COVID team consisting of member of representative of medical team, infection control, microbiologist, occupational therapist and public health should have a daily meeting to determine appropriate discharge to reduce burden on health care and prevent community outbreaks.

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