Converting a standard internal medicine ward into an isolation unit during the COVID-19 outbreak

The ongoing COVID-19 pandemic has a substantial impact on the delivery of health care throughout the world. It also has a profound influence on financial, social and physiological aspects with implications that are yet to be fully recognised. Although the COVID-19 outbreak emerged in China at the end of December 2019, the first patient was identified in Israel on February 21st. This two-month-long gap enabled the Israeli universal health-care system to implement logistic preparations at both national and institutional levels. Under the instructions of the Israeli Ministry of Health, every Israeli hospital converted at least one internal medicine ward into an isolation unit exclusively assigned to treat COVID-19 patients. Unlike critically ill patients hospitalised in intensive care units (where several series of protocols have been proposed), recommendations for the management of patients in the setting of internal medicine wards were scarce.\(^1\)\(^2\) Therefore, this conversion process posed significant medical, logistic and technical challenges.

In this letter, we summarise our experience and outline the guidelines for the organisational aspects of managing COVID-19 patients in an isolated internal medicine ward of a tertiary medical centre. During March-May 2020, our COVID-19 ward treated 91 positive Polymerase Chain Reaction SARS-COV-2 patients. The mean age of the patients was 56.9 years (±23.6); 46.8% of the patients were females. The median length of hospitalisation was 6.0 (interquartile range 2.0-9.0) days. Eight patients (8.8%) were transferred to ICU and six (6.5%) underwent mechanical intubation. The overall mortality rate was 8.8%.

1 | MINIMAL EXPOSURE

The isolation-ward medical and nursing staff are essential resources yet are continuously at risk of contracting SARS-COV-2. Therefore, a major concern is maximising staff safety through minimising exposure to the pathogen. Minimal exposure is facilitated using the following methods:

1. The medical staff enter the isolation ward the least as possible – usually once for morning rounds and later only for new admissions or to tend to deteriorate patients.
2. Every entrance to the isolated COVID-19 ward is carried out with the minimal staff needed.
3. Continuous communication with the team that entered the isolation unit is maintained via intercom.
4. Every entrance is planned ahead. Defined duties are distributed amongst the team prior to entering the unit. Any equipment needed (eg, PCR swabs, medications) is prepared in advance.
5. Procedures are performed only when essentially required.
6. Examination of the heart and lungs is performed with point-of-care ultrasound (POCUS) instead of a stethoscope.\(^3\)

Beyond limiting exposure time in the unit, the staff are also instructed to minimise off-duty social contacts to abate the risk of infection outside of the hospital. In addition, the ward’s staff is divided into separate “capsules.” Each capsule is made up of consistent medical, nursing and paramedical personnel that work at separate 12-hour shifts. Shifts are changed without any physical interaction between the capsule personnel. In this manner, if one capsule member is accidentally infected, only the members of his or her capsule are required to enter preventive isolation (and not the entire staff).

2 | SITUATION ROOM

We operate a situation room (SR) manned around-the-clock by a physician or a nurse. The SR is physically situated outside of the isolation unit and the staff manning it does not require the use of personal protective equipment (PPE). Patients’ vital signs and medical follow-up are transmitted from the isolation ward to the SR through multiple telecommunication channels and are continuously recorded using dedicated hardware and software. In addition, the SR is wired to other relevant units both inside and outside of the hospital for further assistance if needed.

3 | TELEMEDICINE

Multiple telemedicine devices allow the staff to continuously monitor patients from the SR; therefore, further minimising SARS-COV-2 exposure.\(^4\) The isolated COVID-19 ward is interconnected with multiple cameras that broadcast video and sound to the SR. In addition, mobile sensors are attached to the patients, which wirelessly transmit vital signs to the SR via Wi-Fi. A remote-control mobile robot with a screen, microphone and camera can be remotely moved around the isolated ward allowing for an additional method of interactive communication with the patients.
4 | PATIENT EXAMINATION

Because of the limitation posed by the use of PPE, the routine physical examination (PE) of COVID-19 patients is complex. Instead of a standard PE, we recommend appreciating the general condition of the patient, his/her cognitive status, speech flow, mobility level and (in mild to moderate cases) utilising POCUS of the heart and lungs.

5 | INTER-DISCIPLINARY APPROACH

The significance of inter-disciplinary cooperation cannot be overemphasised. During rounds in the unit it is of utmost importance that physicians assist the nursing staff in their routine tasks: eg, measuring vital signs or feeding and bathing patients. A physiotherapist should be integrated into the team to perform respiratory and ambulatory physiotherapy. Involvement of a social worker is crucial for supportive conversations and psychological assistance for the patients and for daily updates with family members.

Daily multidisciplinary briefings and sharing of experiences are important for preventing emotional fatigue and preserving morale.

6 | RESEARCH

We initiated several small-scale studies in our isolated COVID-19 ward. Extensive clinical data of the admitted COVID-19 patients have been collected to evaluate possible associations with demographic and clinical characteristics. We also evaluated several compounds with minimal adverse effects which were recently reported to have possible positive effects on disease prognosis, such as zinc, vitamin C and N-acetyl-cysteine.

In conclusion, treating COVID-19 patients creates unique clinical, organisational and logistic challenges. These challenges can be managed with minimal exposure of the medical staff to COVID-19 patients without losing the therapeutic continuum by utilising various technologies. Notwithstanding, the basic concepts of internal medicine remain the same: high quality and compassionate treatment all the while minimising risk for the patients. More studies are needed to investigate the operation of isolation COVID-19 wards at a larger scale, as well as the preparedness of regional and national health-care systems for this pandemic.

DISCLOSURE

All authors declare no conflict of interest.

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