

Establishing and Managing a Quarantine and Isolation Centre in COVID-19 Pandemic

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Abstract

The novel coronavirus disease (COVID-19) is a recent pandemic which has spread to over 200 countries of the world since its outbreak. As of 21st April, 2020, more than 2.3 million confirmed cases have been reported. The World Health Organization (WHO) has issued a strategic preparedness response plan for countries at risk. This is based on the knowledge of previous epidemics and experience shared by Chinese health authorities. There is special emphasis on strict 'quarantine and isolation' of suspected/diagnosed cases. Pakistan is a developing country with a weak healthcare system. Pakistan Armed Forces have always provided services to the countrymen during natural and man-made disasters. During this pandemic the largest rehabilitation institute in the country was converted into a 130-bed dedicated isolation and quarantine facility for the COVID-19 patients. We will share our experience of establishing and managing this quarantine and isolation facility and highlight the achievements and out-of-the-box solutions applicable for low resource countries like Pakistan.

Keywords: SARS-CoV-2, Disaster response, Coronavirus, Quarantine, PPE, Pakistan.

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Introduction

The novel corona virus disease (COVID-19) pandemic originated from Wuhan City, China, and rapidly spread to more than 200 countries in the world. It is probably the worst pandemic in recent history and has led to panic and global public health emergency.¹ As of 15th April 2020, there are more than 2 million confirmed cases all around the globe with around 160,000 deaths.² The World Health Organization (WHO) issued a strategic preparedness and response plan for countries at risk for the new coronavirus, recommending measures to be adopted to halt and control the spread of the disease including:

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active surveillance, early detection, clinical management, tracing closed contacts and strict "quarantine and isolation" of suspected/diagnosed cases.³ The geographical location of Pakistan made it vulnerable to the pandemic, since it shares border with Iran and China where a large number of cases were reported.

Even the high-income countries with a well-developed healthcare system were overwhelmed with this pandemic within the first few weeks. In contrast, Pakistan is a low-middle income country which spends less than 1% of its GDP on health. The health infrastructure is not well-developed, infectious diseases are common and there are many disparities between the healthcare delivery between the rural and urban areas. The doctor-to-patient ratio in Pakistan is 78: 100,000 and number of hospital beds is mere 0.6: 1000.⁴ Before the COVID-19 pandemic, there was no national health plan or government strategy in place to tackle such a healthcare crisis. Ventilators are one of the necessary requirements for seriously ill patients with respiratory dysfunction. There are insufficient numbers of ventilators in Pakistan. There was no choice for Pakistan but to start preparing for what was coming in the best possible manner according to current circumstances

Strategic Planning and Resource Allocation

Pakistan Military has always been at the forefront of providing logistic, material and technical support to the people of Pakistan during natural and man-made disasters. Officers and staff of Pakistan Army have provided services and support during the 2005 earthquake and the 2010 floods. Army Medical Corps under the guidance of Director General Medical Services, who overlooks the medical setups in the three-armed forces, issued directives to all military medical establishments in the country to prepare for a possible surge of COVID-19 patients. They were asked to allocate beds and prepare designated wards for quarantine and isolation of the suspected patients.

Armed Forces Institute of Rehabilitation Medicine (AFIRM), a 100-bedded medical facility, is the largest tertiary care rehabilitation institute of the country

providing a range of comprehensive and multi-disciplinary services to persons with disabilities.⁵ Considering the unprecedented challenges faced by the country, it was decided to convert this rehabilitation centre into a 130-bedded quarantine and isolation facility. The team at AFIRM already had the experience of managing hundreds of patients with spinal cord injuries and long bone fractures in the 2005 earthquake.⁶ In addition, AFIRM has been the focal centre for the rehabilitation and prosthetic rehabilitation of military amputees all around Pakistan.⁷ It was a huge task to convert a large rehabilitation facility into a COVID-19 isolation and quarantine centre. Collaboration was initiated with the infectious diseases (ID) department of Military Hospital (MH). Multiple in-house discussions as well as meetings with the ID and intensive care unit (ICU) physicians were carried out to establish the facilities for patients with COVID-19. International guidelines and Chinese experience published in international biomedical literature were consulted. After multiple rounds of deliberations between experts, a consensus was reached and local guidelines were developed for dissemination. The existing infrastructure was improvised to create space for an isolation centre. Half of the existing wards were marked as part of the Isolation centre and vacated. Additional isolation rooms were established by converting the hospital guest rooms and hostels. The space between beds in the shared halls was at least 6 feet. Separate entry and exit points were dedicated for the isolation facility to avoid any contact with the other services and persons.

Disinfection of the Facility

Standard disinfection guidelines were followed and rooms were disinfected daily with 0.5% sodium hypochlorite solution. Thrice daily disinfection spray was done at the hospital and repeated after discharge of the patient. Disinfection of the ambulances was also carried out regularly. New standard operating procedures (SOPs) for quarantine, isolation, disinfection, personal protection and patient information brochures were created and distributed.

Isolation and Quarantine Protocols

Initially the quarantine facility was started for army personnel returning from abroad, especially from countries with large number of COVID -19 reported cases. Patients were received by trained staff working in full personal protective equipment (PPE). They were examined by a medical officer, temperature was recorded, and nasal and pharyngeal swabs were taken for polymerase chain reaction (PCR). Strict isolation was

ensured for each admitted case. Food was served indirectly via disposable containers. PCR was repeated after 48 hours in symptomatic patients, and before discharge in asymptomatic patients keeping in view the sensitivity of the test and the persistent symptoms. Two patients, who were initially reported to be negative, became COVID-19 positive on second and third samples, respectively. In the beginning, 98 patients were quarantined over a period of 6 weeks. When the first confirmed case of COVID -19 was reported in Pakistan on 26th February, it was decided to gradually shift the quarantine facilities out of the hospital to peripheral detention centres (quarantines) and to reserve this facility only for suspected symptomatic patients.

Provision of Personal Protective Equipment (PPE)

Considering the national and international news of hospital staff and healthcare workers being infected due to lack of PPE, it was decided that there will be no compromise on the safety of medical and administrative staff.⁸ Full PPE was provided to the frontline workers from doctors to the janitorial staff and was replaced on every duty rotation. PPE were initially arranged for a month and then two months supply was secured. The deficiency of PPE in the market and the exorbitant rise in prices was a major concern for the hospital administration. After exploring different kinds of material and fabrication techniques, staff and patients of the vocational resettlement department, artificial limbs and appliance centre, and human resource department were involved. These staff members and patients are skilled workers who used to create prosthetic components and orthosis for use for persons with disability. They were now trained and tasked to produce masks, protective face shields, protective suits, shoe and head covers locally. This was a great leap towards being self-sufficient and it gave more confidence to the staff dealing with the patients. The cost of these locally designed PPE was significantly lower than the market price.

Optimising the Use of PPE

Pre-empting the possible shortcoming of the PPEs, steps were taken to optimise the use of PPE and save it for the worst scenario. Desperate times require desperate measures. Being a developing country with limited resources at our disposal, these efforts were made without compromising the safety of the staff. Following measures were taken:

- ◆ Education of the staff regarding judicious use of PPE
- ◆ Multitasking by staff related to patient care to reduce

the number of visits

- ◆ Telephonic history and updates in asymptomatic patients
- ◆ CCTV monitoring/tele-monitoring instead of physical visits
- ◆ Optimising the janitorial staff visits based on workload
- ◆ Development of local PPEs
- ◆ Regular PPE audits

Tele-monitoring

In order to make more efficient use of PPEs and for the safety of frontline staff, a system of tele-monitoring by the use of CCTV cameras was done. Regular contact with the patient through telephone was maintained to avoid unnecessary visits in asymptomatic and mild cases.

Staff Training

COVID-19 management for AFIRM was a great challenge. It put our ordinary staff under extraordinary situations. We had to look after our staff safety and ensure it in all circumstances. We had to prepare all our support staff in infection control to the highest level which was not a previous routine for a rehabilitation facility dealing with mostly stable cases with long-term neurological and musculoskeletal disabilities. Staff training was carried out on priority and regular basis for donning and doffing of PPE, maintaining disinfection, and interaction with the positive cases. The janitorial staff was also trained in donning and doffing, and disinfection. Mandatory supervised training was carried out on daily basis regardless of experience and previous trainings including disinfection, waste disposal, sampling and support staff training. Perhaps this was one of the reasons that none of the staff got infected despite treating more than 20 positive cases and processing more than 500 cases to date.

PCR Sampling

Nasal and nasopharyngeal swab are the main stay of PCR sampling for COVID 19.⁹ The sensitivity of the swabs varies from 40-67% and if not properly done, it can compromise the results. Special emphasis was done on training of nursing staff that were responsible for taking samples for PCR and safe transport of samples to the laboratory. AFIRM has conducted more than 500 tests so far.

Development of Guidelines/SOPs

Local guidelines were developed for different aspects of COVID-19 management keeping in view the latest available evidence and international recommendations.

Guidelines were developed for PPEs, staff roster, sampling, isolation and quarantine, patient education, management, disinfection, transfer of suspected patients, transport of samples and dead body management and burial.

Contact Tracing

A robust system of contact tracing was ensured so as to contain the spread of the disease. Contact details of every suspected patient, including home and office address, were documented at the time of admission. The details were shared with crisis management cell the moment any patient had a positive PCR assay for COVID-19. All the contacts were then isolated and tested for COVID-19.

Patient Flow Management

All patients reporting to the hospital were screened at the main entrance. It was ensured that they were wearing masks and gloves and their temperature was checked. Hand sanitizers were provided at main gate and at entrances to the hospital blocks. PPE was provided to the main gate staff and reception staff at the isolation reception. There was open and quick communication between clinical staff and administration. Policy for bed management and room assignment were developed and ensured. Close liaison was maintained with laboratory to ensure sampling for every patient within 6 hours of admission. Staff that were performing duties at symptomatic patient areas and at COVID-positive isolations were provided full PPE. They were kept isolated even during their off time and accommodated in a separate block in the hospital. PCR testing was done for symptomatic staff and those performing duties for more than a month at the isolation. They were quarantined after completing their duty cycle before they could go home.

Table: Recommendations for the efficient management of an isolation and quarantine centre in low resource settings.

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- ◆ Team building and a clear task distribution for each team member is essential
 - ◆ Adequate and evidence-based training of medical and administrative in different aspects of disease management
 - ◆ Local guidelines and standard operating procedures (SOPs) should be devised and implemented
 - ◆ Hospital disinfection should be a top priority and strictly followed
 - ◆ Adequate number and replenishment of personal protective equipment (PPE) should be ensured to maintain safety and gain trust of the frontline staff
 - ◆ Training in donning and doffing of PPE and patient interaction is vital
 - ◆ Optimisation of the use of PPE should be done without compromising safety
 - ◆ If feasible, local PPE should be developed to reduce cost and ensure supply
 - ◆ Continuous motivation of the frontline staff, fulfilling their administrative requirements and ensure periodic breaks to avoid burn-out
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Recommendations

Developing and successfully managing a specialised isolation and quarantine facility for COVID-19 was a big challenge. It involved coordination and cooperation between different tiers of healthcare along with creations of SOPs considering the local context and thinking of out-of-the-box solutions. Based on our experience of establishing and managing a 130-bedded isolation centre for COVID-19 we offer some recommendations to facilitate and guide colleagues working in similar challenging situations. These are highlighted in Table.

Conclusion

AFIRM, which has established itself as a centre of excellence in rehabilitation and disability management, has also excelled in managing a dedicated COVID-19 centre. This was possible only because of dedicated teamwork, meticulous and detailed workup for all aspects and ensuring safety of the staff and patients at the same time without compromising quality.

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