

Experience of the medical personnel of a peruvian public hospital in the face of the COVID-19 pandemic

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Abstract

The arrival of the new coronavirus disease (COVID-19) has challenged and exposed the precarization of health systems in the face of pandemic diseases. Medical personnel has demonstrated their commitment to service and workforce force, despite having inadequate medical equipment, supplies, hospital beds, and personnel, not to mention the risk of being victims of this disease. With this article, we aim to share the experience and capabilities of the medical staff to overcome adversities: their resilience and resourcefulness in the face of traumatic situations, and using and modifying any available equipment in the absence of mechanical ventilators to mitigate the progression of the disease.

MAIN MESSAGES

- ♦ Along with professional preparation, the resilience of the medical staff was the most important factor in overcoming the COVID-19 pandemic.
- ♦ Medical staff displayed their ability to adapt positively and to overcome traumatic circumstances caused by this pandemic.
- ♦ This article presents the experiences of a Peruvian reference hospital in the face of the COVID-19 pandemic, which can be compared to other similar realities in Latin America.

INTRODUCTION

When the first cases of the new 2019 coronavirus disease (COVID-19) were reported in China, it was assumed that the virus would probably not reach South America, as was the case with the severe acute respiratory syndrome (SARS) in 2003 [1].

A few weeks later, it became clear that this new virus was aggressive, spreading fast worldwide and generating a huge demand for care within a short period of time. This situation led to the collapse of healthcare systems, evidenced by the lack of beds in intensive care units in countries such as Italy, France, Spain, the United Kingdom, Germany, and the United States [2].

These concerning reports alerted the Daniel Alcides Carrión Hospital staff in Huancayo, located in central Peru. This referral facility is responsible for caring for patients over 18 years with clinical and surgical problems. The infectious disease service prepared the COVID-19 prevention and treatment guidelines based on the Chinese consensus on managing patients infected with severe acute respiratory syndrome coronavirus (SARS-CoV-2). This guideline recommended using paracetamol, hydroxychloroquine, and corticosteroids for COVID-19 treatment [3]. Hydroxychloroquine was subsequently withdrawn due to insufficient evidence.

FIRST APPROACH TO THE PANDEMIC

The health personnel in charge drafted the work plan and presented it to the institution's administration. This included requests for human resources, supplies, equipment, and infrastructure, which initially went unanswered. Two weeks later, a representative of the Ministry of Health decided to visit our establishment, given geographics and infrastructure characteristics. In this first meeting with the management, it was communicated that our hospital, which has about 200 inpatient beds, would be the exclusive care center for COVID-19 patients. At that time, some cases of COVID-19 had already been reported in neighboring countries such as Argentina, Brazil, Chile, and Colombia.

Given the history of this disease in other countries and the fear of spreading it to non-COVID-19 patients, four additional inpatient units were set up, each with 12 beds exclusively for COVID-19 patients. These units were in an old building isolated from the rest (used for administrative and preventive work). The rooms had few oxygen channels, so oxygen balloons were placed next to each bed. In one of the rooms, four beds for the care of critical patients with mechanical ventilators started to be set up.

At this point, medical staff assumed that the 48 hospital beds would withstand the first wave of this pandemic (as 24 beds were sufficient for the H1N1 influenza pandemic), while in Spain, it was reported that entire hospitals were insufficient to cope with the demand. Regarding pharmacological treatment, lopinavir/ritonavir was recommended at that time [4]. However, these drugs were never used due to further change in management guidelines.

Meanwhile, a patient reported to the press that it took two weeks for the Ministry of Health to inform him that he was the first case of COVID-19 in Peru. This prompted the president of the republic to declare a national sanitary alert and declared mandatory home lockdown for all people in Peru except for medical and police personnel.

Problems began with the arrival of the first patient at the hospital. She was a nursing technician from a peripheral health center; admitted with 80% oxygen saturation, subcostal pull, and distal cyanosis. After providing continuous oxygen, a chest X-ray was requested, but the X-ray staff refused to transfer the patient to their facilities out of fear of virus transmission (they did not have a computerized tomography scan). Afterward, laboratory samples were requested, but the same happened: the laboratory staff did not want to receive her samples because of the risk of the virus spreading among the staff members.

After solving these initial problems and stabilizing the patient, we went to dinner, but they did not allow us in, claiming that we were carrying the virus. Therefore, a dining room was set up near the COVID-19 hospitalization units without leaving the old premises. The next day, each service chief began to hold awareness meetings, thus starting the disinfection and biosecurity protocol drawn up by the Ministry of Health and previously modified by the health team according to the hospital's current situation.

The patient was a probable case of COVID-19, given the presence of respiratory symptoms, a bilateral interstitial pattern on chest X-ray, and lymphopenia with increased lactate dehydrogenase in laboratory tests. Oxygen balloons were moved to the patient's bed every six hours due to high oxygen requirement. When the adaptation of mechanical ventilator beds and monitors was finally completed in the same rooms of the old facility, the patient refused to go on the mechanical ventilator despite her respiratory distress. To everyone's amazement, the patient improved and was finally discharged after 21 days. On the 10th day of hospitalization, the molecular results from Lima confirmed the case of COVID-19. The results were delayed because the lockdown challenged to transfer the samples to another city.

Each time the medical staff finished their hospital shift, they had to discard all their personal protective equipment in compliance with the Ministry of Health's biosafety regulations. This consisted of an apron, overalls, trousers, shirt, two pairs of gloves, boots, cap, N95 mask, and surgical mask. What was not discarded was reused. This type of clothing caused heavy sweating and made procedures difficult due to the opacity of the face mask caused by the exhaled air. These items were for a 24-hour shift so that if they entered again, they wore the same clothes.

We were not allowed to enter the rooms of the medical residence due to the fear of spreading the disease to the rest of the staff, who were not yet treating patients with COVID-19. Again, it was argued that we were carrying the virus. For this reason, rest areas were set up in the same COVID-19 facilities.

In the following weeks, two to three patients arrived every day until two hospitalization units were occupied; several were police officers or shopkeepers. Two more units were available, but the four beds of the intensive care unit in the same room had already been taken up. As a result, the beds in the new facility began to be set up. The staff working in this area were reluctant to make these changes due to initial fear.

The medical staff over 60 years of age or with comorbidities were sent home in compliance with a resolution of the Ministry of Health, and this represented 40% of work absence from the entire hospital. Some physicians had pathologies such as chronic obstructive pulmonary disease and asthma, while others requested unpaid leave. Medical interns went home, and medical residents refused to enter COVID-19 services. In the end, only 30% of the care staff remained. Many refused to work in the COVID-19 units for fear of infection, and others resigned.

THE CRISIS DEEPENS

One morning 20 patients arrived from prison with high oxygen requirements. Many received 15 liters per minute, and some had mechanical ventilator admission criteria, occupying the last two COVID-19 units in the old building. Oxygen balloons ran out quickly, and some patients died within hours of admission due

to a lack of ventilatory support. We were told that more patients in prison would be sent the next day.

The head of nursing reported that he had no staff because several nurses called in with respiratory symptoms, and the head of maintenance reported that there were no more oxygen cylinders. Because of this, we had to use one oxygen balloon for every two patients by making a handmade T-system from a three-way tap, and the medical staff moved these heavy balloons from one patient to another. Confirmatory tests were performed in another city, and the results took seven days to arrive. Cases were managed on clinical and radiographic suspicion. The rapid immunochromatography test (reagent strip) that reacted to immunoglobulin M or G (IgM or IgG) gave false expectations to patients when they were negative. At that time, we had no physicians, nurses, or medical technologists.

During that night, more inpatient services were opened, this time in the new building. Physicians from other specialties, such as gastroenterologists, geriatricians, internists, neurologists, dermatologists, and general practitioners from administrative areas were trained by infectious disease physicians and joined the care of these eight additional inpatient units. All of this was insufficient because patients kept coming. In response, we trained and encouraged surgical doctors to care for these SARS-CoV-2 patients. Thus, ophthalmologists, surgeons, neurosurgeons, and traumatologists came to treat the infected patients. Some were left in tears at the sight of people in such terrible conditions and without intensive care beds. When an 18-bed intensive care unit became available in a health center 30 minutes away (dedicated to primary care before the pandemic), it was immediately occupied. Many patients died in transit due to the instability caused by the mobilization. This area was staffed 100 percent by emergency, internal medicine, and anesthesiology physicians due to the lack of intensivists. The patients chosen for admission to the intensive care unit were usually the youngest.

By this time, the 14 inpatient departments with 12 beds each, exclusively for COVID-19 patients (168 beds), were occupied to their full capacity. Moreover, there was no space to move around in the differentiated triage area. Patients waited seated on the floor; some brought mattresses, others brought reclining chairs, and some died waiting for a hospital bed.

EXTREME MEASURES AMIDST THE CRISIS

It came to a point where the doctors who joined the triage team immediately resigned when they saw the number of seriously ill patients. Some called in tears, saying they could not take it anymore, and left the hospital.

To save as much time as possible and avoid contamination, many physicians went to work in disposable diapers, did not drink liquids to avoid the restrooms, or had large breakfasts to avoid lunch areas.

There were no more oxygen balloons for the opening of beds. At times, oxygen pressure was insufficient in intensive care and inpatient units. This situation was exacerbated when ten beds were opened in the intensive care unit inside the hospital. Thus came the peak of patients in the first wave. In the end, 40% of the medical staff and 60% of the nursing staff became ill with COVID-19, and all services had to be covered with the few staff left standing. Some days a single physician had to cover up to five units.

It is worth remembering that there were no interns or medical residents who, in pre-pandemic times, were in charge of taking medical records and making daily evolutions and procedures. However, something surprising happened: convalescing medical staff in recovery asked to continue working in COVID-19 areas. Some of them were grieving the loss of family members to this disease, yet they continued working. This noble act demonstrates the medical staff's commitment to service and strength in the face of this pandemic.

Eventually, the medical residents finally joined the COVID-19 services. The budget came in to hire more medical staff, but there was no availability of specialist doctors, so general practitioners and recently graduated nurses without professional qualifications were hired. By this time, we were working with antigenic tests that provided better diagnoses, and we started to administer ivermectin following national guidelines approved by the Peruvian Ministry of Health [5]. This drug quickly ran out on the market, so veterinary ivermectin had to be used (as in systemic strongyloidiasis). Later, no evidence emerged to support its use, which is why it was no longer recommended.

Due to the lack of beds in the intensive care unit, non-invasive high-flow systems such as helmets, high-flow nasal cannula, high-flow masks, and the Wayrachi system started to be used, with little improvement. Finally, we found that adapting the

snorkel diving mask with the Charlotte connection and peep valve with double oxygen inlet improved many patients. We started using convalescent plasma, given that some studies showed benefits while other drugs, such as tocilizumab, did not. Later, treatment guidelines changed again.

Many relatives waited in the streets, begging for beds in the intensive care unit for their relatives. During all this time, contact with relatives was through phone calls from the physicians' mobile phones on duty. As a result of this, harassing and even threatening calls were made. Fortunately, the number of cases began to decrease progressively. However, Peru was one of the countries with the highest mortality rates in the world.

SECOND WAVE

Finally, the first wave of the pandemic came to an end. While waiting for the second wave, the long-awaited computerized tomography scanner arrived, and molecular tests began to be carried out in Huancaayo. We had experienced medical personnel managing infected patients, rapid antigenic tests, and oxygen generators. Treatment guidelines were again updated, including convalescent plasma transfusion, the use of CASMON masks (named after Dr Castro and Dr Montalvo, who adapted this snorkel-type device) in high-risk patients, the use of ivermectin was withdrawn, and the use of antibiotics was severely restricted.

Seemingly, we were better prepared for this second wave. Some recommended reopening general care, but we stood firm in our refusal. The delta variable, a new mutation of SARS-CoV-2, appeared; and with it, the second wave had more accelerated growth. Again, all 14 inpatient services were fully occupied. Two services were for patients with modified high-flow snorkel

Figure 1. Optimistic medical staff showing the modified snorkel masks called Castro-Montalvo (CASMON) in the high-flow hospitalization unit.



Source: Prepared by the authors of this study.

systems called CASMON [6] (Figure 1). We now had two intensive care unit services, one 30 minutes away from the hospital with 18 beds and the other within the facility with ten beds.

In this second wave, we observed that patients arrived more severely, some in a pre-mortem state and others with an oxygen saturation of 40% [7]. At the wave peak, the oxygen pressure dropped again due to the high demand of the patients from multiple points. Again the differentiated triage care collapsed. Many were waiting for an oxygen-free point while others arrived with their oxygen generators. Sedation supplies such as fentanyl, midazolam, and rocuronium were out of stock in the pharmacies, causing physicians to use diazepam and morphine to keep patients on mechanical ventilators. Once again, the Peruvian health system was brought to its knees in the face of SARS-CoV-2.

Eventually, the vaccinations arrived, which reduced the severity of health personnel infections, but they were still on medical rest for 14 days and had to be quickly replaced by another colleague. In this second wave, there was a lack of beds in the intensive care unit due to the extended hospital stay and the seriousness of patients who received medical attention too late. We also had to deal with physical aggression from relatives toward treating physicians. The second wave's peak lasted two months; this time we had to deal with a lack of supplies, oxygen, and –again– a lack of beds in the intensive care unit.

The local government issued a directive encouraging workers who had received two doses of vaccine to return to their health-care activities (the vaccine administered was Sinopharm BBIBP). After returning to regular activities, some died from this disease. This led to a suspension of returning and the approval by the Ministry of Health of the third dose of vaccine (this time BioNTech Pfizer) which decreased mortality in patients with risk factors for developing the severe disease [8,9]. Despite our efforts, at the end of the second wave, mortality was similar to the first wave.

During this time, many political changes happened in our country: three presidents of the republic, five ministers of health, and the hospital's four directors came to lead us. Perhaps this political instability was one of the reasons why Peru came to be ranked as one of the countries with the highest mortality rates.

Although healthcare workers experienced emotional exhaustion, stress, anxiety, depressive symptoms, and fear of infecting their families [10], they showed resilience in the face of adversity. This was the most crucial factor in overcoming this pandemic which, along with the commitment to service, may explain why we were emotionally ready for the next wave of cases.

RECOMMENDATIONS FOR FUTURE PANDEMICS

In the event of a pandemic, all health facilities, at all levels of care and institutions, should provide direct care to affected patients. Likewise, the "safe hospital" care plan should be strengthened according to its capacity for resolution and patient selection. Therefore, we insist that all establishments, social security, public, police, military, health posts, and health centers should be fully involved.

In addition, we suggest not implementing units far from the health facility due to the high mortality observed and the need for multidisciplinary management.

Finally, it is essential to continuously strengthen health systems with supplies, equipment, oxygen generators, health personnel, and infrastructure in non-pandemic periods.

Notes

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RM and RA: conceptualization, validation, formal analysis, research, writing - first draft, writing, revising and editing.

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References

1. Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P, et al. Comorbidity and its Impact on Patients with COVID-19. *SN Compr Clin Med*. 2020;2: 1069–1076. <https://pubmed.ncbi.nlm.nih.gov/32838147/> <https://doi.org/10.1007/s42399-020-00363-4>
2. Organización Mundial de la Salud (OMS). Weekly Operational Update on COVID-19. 5 Jan 2021. <https://www.who.int/>

- publications/m/item/weekly-epidemiological-update---5-january-2021
3. Zhonghua Jie He He Hu Xi Za Zhi. Multicenter collaboration group of Department of Science and Technology of Guangdong Province and Health Commission of Guangdong Province for chloroquine in the treatment of novel coronavirus pneumonia. 2020;43. <https://pubmed.ncbi.nlm.nih.gov/32164085/> <https://doi.org/10.3760/cma.j.issn.1001-0939.2020.0019>
4. Ministerio de la Sanidad, España. Documento técnico Manejo clínico del COVID-19: tratamiento médico. 2020. https://www.semg.es/images/2020/Coronavirus/20200319_Protocolo_manejo_clinico_tto_COVID-19.pdf
5. MINSA. Norma Técnica para el Manejo de Personas Afectadas por COVID-19 en los Servicios de Hospitalización, aprobada por Resolución Ministerial N° 1366-2021. <https://www.gob.pe/institucion/minsa/normas-legales/2616485-1366-2021-minsa>
6. Montalvo R, Castro E, Chavez A. Alternative to traditional noninvasive ventilation using A modified snorkel mask in A patient with SARS-COV2: A case report. Can J Respir Ther. 2021;57: 18–21. <https://pubmed.ncbi.nlm.nih.gov/33585674/> <https://doi.org/10.29390/cjrt-2020-039>
7. Suárez Alejandro MD, Castro Espejo JJ, Meza Veliz DC, Vila Paucar KD, Rivera Pizaro G, Montalvo R, et al. Comparación de las características clínicas de la primera y segunda ola por COVID-19 en un hospital público de Perú. BMSA. 2022;62: 24–31. <http://iaes.edu.ve/iaespro/ojs/index.php/bmsa/article/view/419/621> <https://doi.org/10.52808/bmsa.7e6.621.004>
8. Retamozo Cárdenas F, Montalvo R, Ricaldi O, Montalvo M, Ninahuanca C, Ochoa S, et al. Exceso de grasa visceral asociado a severidad de COVID-19, cuantificado por bioimpedancia. BMSA. 2022;62: 32–38. <http://iaes.edu.ve/iaespro/ojs/index.php/bmsa/article/view/420/622> <https://doi.org/10.52808/bmsa.7e6.621.005>
9. Chemali S, Mari-Sáez A, El Bcheraoui C, Weishaar H. Health care workers' experiences during the COVID-19 pandemic: a scoping review. Hum Resour Health. 2022;20. <https://pubmed.ncbi.nlm.nih.gov/35331261/> <https://doi.org/10.1186/s12960-022-00724-1>
10. Shreffler J, Petrey J, Huecker M. The Impact of COVID-19 on Healthcare Worker Wellness: A Scoping Review. West J Emerg Med. 2020;21: 1059–1066. <https://pubmed.ncbi.nlm.nih.gov/32970555/> <https://doi.org/10.5811/westjem.2020.7.48684>

Experiencia del personal médico de un hospital público peruano frente a la pandemia por COVID-19

Resumen

La llegada de la enfermedad por el nuevo coronavirus (COVID-19) ha desafiado todos los sistemas de salud y puso en evidencia el precario sistema sanitario frente a enfermedades pandémicas. A pesar de esto, el personal médico ha demostrado la vocación de servicio y la fuerza laboral, aunque trabaje con insumos insuficientes, equipos médicos inadecuados, falta de camas de hospitalización, falta de personal y algunos fallezcan víctimas de esta enfermedad. Con este artículo pretendemos difundir las experiencias y la capacidad del personal médico para vencer estas adversidades, la adaptación positiva a estas situaciones traumáticas, utilizar y modificar todas las herramientas disponibles ante la falta de ventiladores mecánicos que lograron mitigar la progresión de la enfermedad.



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