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# Covid-19 in Patients Deprived of Liberty in a Prison Deposit Unit

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## Abstract

The prison system had to incorporate measures aimed at the prevention, early detection, isolation and treatment of patients with COVID-19. The Penitentiary Center for Infectious Diseases-Unit 21 was set up as a referral site. A descriptive, observational, cross-sectional study was carried out in which the characteristics, treatment and evolution of patients admitted to the Unit for COVID-19, in the context of detention, were described. In the period studied (May 1-October 15, 2020), 427 cases of COVID-19 were registered in the Federal Penitentiary Service, of which 193 were referred to Unit 21. Of these, 191 (98.9%) were of Male gender, with a median age of 51.5 (RI 32.5). 74 patients (38.3%) had mild forms of the disease, 110 (56.9%) were moderate, 7 (3.6%) were severe. 6 patients (3.1%) required the Intensive Care Unit, of which 2 were admitted to the Unit in critical condition and received less than 48 hours of treatment in our center. There were 4 deaths, 2 from respiratory distress, 1 from brain stem stroke, and 1 sudden death. According to severity criteria, the patients received treatment with ivermectin, corticosteroids, antibiotics, antiaggregant and / or antithrombotic prophylaxis. 66.6% had at least one comorbidity and 22.8%, 2 or more. The documented COVID-19 fatality was 2.07% in our center. This is relevant considering the data reported from other prison populations, for example from American prisons where mortality was 5.5 times higher than in the rest of the population.

**Keywords:** COVID-19; Pandemic; Jails; Argentina

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## Introduction

With the advent of this new disease caused by the severe acute respiratory syndrome-corona virus 2 (SARS-CoV-2) declared a pandemic by the World Health Organization (WHO) on March 11, 2020, the prison system was saw the need to adapt its operation. To this end, a series of measures aimed at the prevention, early detection and referral of all patients with a detectable result of a reverse transcriptase polymerase chain reaction (RT-PCR) for SARS CoV-2 were established to our center, the Unit 21 of the Federal Penitentiary Service (SPF) in Argentina. (Provision No. DI-2020-48-APN-SPF # MJ and Provision No. DI-2020-58-APN-SPF # MJ) [1].

Unit 21 is the main Hospital Center within the SPF's orbit for the referral of patients with infectious diseases, it is located on the premises of the Francisco Javier Muñiz Infectious Hospital (HIFJM) and has respiratory isolation modules for diagnosis and treatment thereof.

The first case of COVID-19 was detected in Argentina on March 3, 2020 in an adult patient [2], in the SPF it was on April 24 at the Penitentiary Center of the Autonomous City of Buenos Aires (CABA).

In July, due to the dynamics of the pandemic and the increase in cases, the criteria for admission to Unit 21 was modified, from the isolation of patients without risk factors to those with risk factors or moderate forms / severe disease.

The objective of this study was to describe the characteristics, treatment and evolution of patients admitted to Unit 21 of the SPF for COVID-19, in the context of detention.

## Material and Methods

Descriptive, observational, cross-sectional study of patients admitted to Unit 21 of the SPF between May 1 and October 15, 2020.

The diagnosis of COVID-19 was made by RT-PCR or compatible tomographic images plus positive SARS CoV-2 serology.

The clinical data were obtained from the medical records of the unit.

Comorbidities and coinfections were considered according to the diagnoses recorded in the referral history.

Obesity was considered according to a body mass index (BMI) greater than 30.

The cases were classified according to the WHO definitions as mild, moderate, severe, and critical [3].

**Mild Disease:** Patients without comorbidities, without pathological images in X-ray and / or CT of the chest and without symptoms of pneumonia.

**Moderate disease:** Patients with any of the following: presence

of comorbidities and / or pathological images on X-ray and / or CT of the chest compatible with COVID-19 according to the consensus of the North American Society of Radiology or with clinical signs of pneumonia (fever, cough, dyspnea, tachypnea) but no signs of severe pneumonia, particularly SpO2 ≥ 90% with room air.

**Serious Illness:** Patients with clinical signs of pneumonia (fever, cough, dyspnea, tachypnea) plus some of the following: respiratory rate> 30 inspirations / minute, severe respiratory distress or SpO2 <90% with room air, extensive compromise was also considered due to X-ray images and / or computed tomography of the chest compatible with COVID-19 according to the consensus of the North American Society of Radiology [4].

**Critical illness:** Requirement of an Intensive Care Unit (ICU) or death due to COVID-19.

Treatment was indicated according to the severity and evolution of the patient.

Mild patients were initially indicated general and symptomatic care. Starting in July, ivermectin began to be indicated at a dose of 12 mg daily for 5 days.

Patients admitted with a moderate COVID-19 diagnosis received an association of ivermectin at fixed doses of 24 mg daily for 5 days, plus azithromycin 500 mg, plus meprednisone 20 mg, plus acetylsalicylic acid 100 mg, in addition to antibiotic therapy according to images radiological findings consistent with pneumonia or clinical or laboratory signs of bacterial superinfection.

And to the serious ones, intravenous treatment with dexamethasone 6 mg daily was added and antibiotic therapy was passed intravenously.

Critically ill patients were referred to ICUs at the HIFJM.

Enoxaparin was indicated as thromboprophylaxis, in patients with D-dimer values greater than 3000 and in those with any of the following risk factors: oncological history, previous thrombosis, prolonged rest or Familial thrombophilia according to the Recommendations for thromboprophylaxis and antithrombotic treatment in patients with COVID-19 of the Spanish Society of Thrombosis and Haemostasis [5]. The dose used was 60 mg / day subcutaneously. This indication was implemented after the death of a thromboembolic cause, cerebrovascular accident (CVA) of the brainstem, and was maintained until the discharge of hospitalized patients.

## Results

The prison population as of October 15, 2020 in the SPF was 11,495, which represents 94.24% of the occupation capacity. In the period studied (between May 1 and October 15, 2020) 427 cases of COVID-19 were registered in the SPF, of which 193 were referred to Unit 21. All cases were diagnosed with positive RT-PCR, except for two patients with negative RT-PCR, who underwent a compatible Tomography diagnosis and positive serology for SARS-CoV-2.

Of the 193 patients admitted to Unit 21, 191 (98.9%) were male, with a median age of 51.5 (IR 32.5).

74 patients (38.3%) had mild forms of the disease, 110 patients (56.9%) were moderate, 7 patients (3.6%) were severe. There were 6 (3.1%) patients who required ICU, of which 2 were admitted to the unit in critical condition and received less than 48 hours of treatment in our center. There were 4 deaths, of which 2 were due to respiratory distress, 1 from thromboembolism (brain stem stroke) and 1 sudden death.

66.6% had at least one comorbidity and 22.8% had 2 or more comorbidities.

The most prevalent was, as in the general population, HTN (32%). Smoking was present in 18% of the patients and 16% were diabetic. 6% were obese and chronic lung diseases (asthma and COPD) were present in 18%.

In 152 of 193 patients, RT-PCR controls were performed prior to discharge and 39 patients were discharged from the protocol without control RT-PCR.

On day 14, 38 patients (19.6%) became negative for RT-PCR, at 21 days 77 patients (39.8%) and 27 patients (14%) after 28 days. It took more than 29 days for 10 patients to become negative for RT-PCR (5.1%), the longest persistence of positive RT-PCR was found in a single patient who became negative at 42 days.

92% had access to an imaging diagnosis, 58.5% by chest tomography.

The documented fatality was 2.07% in our center. In all the SPF Units, including Unit 21, it was 3.27%, and if the patients admitted to our center are excluded, the fatality rises to 4.3% in the rest of the SPF units (Table 1 and Figure 1).

**Table 1:** Demographic characteristics of the patients.

| FEATURES | n | % |
|---|---|---|
| Male gender | 191 | 98.9% |
| Distribution by age group | | |
| 20-29 | 32 | 16.7 |
| 30-39 | 37 | 19.1 |
| 40-49 | 26 | 13.5 |
| 50-59 | 32 | 16.5 |
| 60-69 | 42 | 21.8 |
| 70-79 | 19 | 9.8 |
| 80 and over | 5 | 2.6 |

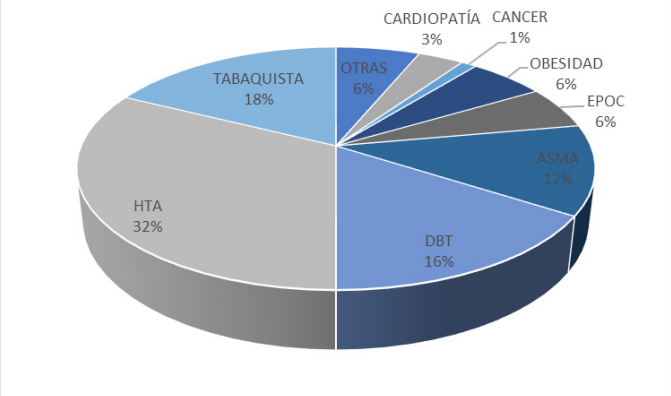


**Figure 1:** Comorbidities.

## Discussion

According to what has been documented to date, it is known that 40% of COVID-19 cases develop mild symptoms (fever, cough, dyspnea, myalgia or arthralgia, odynophagia, fatigue, diarrhea and headache), 40% have moderate symptoms (pneumonia), 15% develop severe clinical manifestations (severe pneumonia) that require oxygen support, and 5% develop a critical clinical picture presenting one or more of the following complications: respiratory failure, acute respiratory distress syndrome (ARDS), sepsis and septic shock, thromboembolism and coagulation disorders, and / or multiple organ failure, including acute renal failure, liver failure, heart failure, cardiogenic shock,

myocarditis, cerebrovascular accident, among others. Complications attributed to invasive or non-invasive procedures performed during the clinical management of the case have also been documented. Complications from COVID-19 occur mainly in people with risk factors: older adults, smokers, and those with underlying comorbidities such as hypertension, obesity, diabetes, cardiovascular disease, chronic lung disease (for example, chronic obstructive disease and asthma), chronic kidney disease, chronic liver disease, cerebrovascular disease, cancer, and immunodeficiency [3].

Most of our patients had risk factors such as age, male sex, multiple comorbidities, and smoking.

The male gender predominates in the prison population, which reflects the proportion seen in our center.

The prevalence of comorbidities such as hypertension and diabetes were similar to the statistics reported in Argentina [7,8]. However, there was a higher percentage of asthmatic patients (12%) compared to the prevalence reported at the national level which amounts to 6% 9 and a lower percentage of COPD (6%) and Smoking (18%) which amount to 14.5% and 22.2% respectively [8,10].

Moderate forms of COVID-19 disease were more frequent due to the referral criterion that was modified during the pandemic, since most patients with a mild course of the disease were isolated in the respective wards of the prison units destined for this purpose. Mild patients were admitted mainly between May and July. It is worth highlighting the low frequency of evolution to serious (3.6%) or critical forms of the disease (3.1%), as well as the low lethality (2.07%) compared with the data of the general population in Argentina [2], despite the high prevalence of risk factors in our population. This is relevant taking into account the data reported from other prison populations, for example from US prisons where mortality was 5.5 times higher than in the rest of the population [11]. It is worth mentioning that after introducing enoxaparin prophylaxis, no events or deaths of thromboembolic cause were recorded.

Regarding treatment, there is still no rigorous evidence despite the multiple clinical studies that are being carried out. However, there are drugs that deserve to be taken into account first of all based on their safety profile.

One of the pillars in the treatment includes the control of the pro-inflammatory effects and consequent tissue damage triggered by this virus. Notable studies include the Randomized Evaluation of COVID-19 Therapy (RECOVERY) trial in the UK, which reported its findings from 6,425 patients randomized to dexamethasone 6 mg / d or usual care. Overall, dexamethasone resulted in an absolute reduction in mortality of 2.8% (22.9% versus 25.7% for usual care). The benefit was greater for patients receiving invasive mechanical ventilation at the time of randomization with a mortality of 29.3% for dexamethasone versus 41.4% for usual care [12]. In this sense, its oral therapeutic introduction was taken into account based on the equivalence to a dose of 20 mg in those cases with moderate disease and mainly in those with images compatible with ground glass infiltrates in chest tomography.

The thromboembolic events recorded led to the consideration of prophylaxis in patients with risk factors, taking into account the recommendations of the Spanish Society of Hematology, 5 establishing the same as of July. Prior to this, acetylsalicylic acid was indicated at antiplatelet doses.

In addition to its antimicrobial properties, azithromycin is sometimes used for its immunomodulatory properties, especially in patients with chronic lung disorders. Azithromycin polarizes macrophages towards an M2 anti-inflammatory phenotype and inhibits the pro-inflammatory signaling pathways STAT1 and NFκB [13,14]. In the context of anti-inflammatory effects, it is of particular interest that azithromycin is used in patients requiring intensive care for ARDS not related to COVID-19 and is associated with a significant reduction in mortality and a shorter time to extubation [15-17].

Antimicrobial treatment with broad-spectrum antibiotics such as amoxicillin / clavulanic acid, ampicillin / sulbactam or ceftriaxone was indicated according to the clinic and radiology, because in the context of a pandemic, bacteriological rescue becomes difficult. Its establishment was early, knowing the complications due to bacterial superinfection in respiratory viral diseases [18].

It was decided to start treatment with ivermectin when the first data from ongoing studies began to be mentioned [19], because it is a drug widely used for the treatment and control of various tropical diseases. The drug has an excellent safety profile, with more than 2.5 billion doses distributed in the last 30 years [20]. Ivermectin inhibits the in vitro replication of some positive single-stranded RNA viruses, namely dengue virus (DNV), Zika virus, yellow fever virus, and others [21-27].

Caly L, et al. (2020) [27] recently reported that ivermectin is a potent inhibitor of SARS-CoV-2 replication in vitro. Pharmacokinetic studies in healthy volunteers have suggested that single doses of up to 120 mg of ivermectin can be safe and well tolerated [29].

Given the scarcity of evidence and the imminent need to provide care and treatment to a vulnerable population, we opted for a treatment in our center that could modify the prognosis, based on the concepts of compassionate treatment30 and taking into account that it is an emergency sanitary from which we were learning as we went.

The drugs used in addition to being approved by both the Food Drug Administration (FDA) and its counterpart in Argentina the National Administration of Medicines, Food and Medical Technology (ANMAT), are relatively inexpensive, accessible and with a wide range of safety and adverse effects known and managed in clinical practice. Which, added to the evidence from promising ongoing studies [31-34], justified its use in our population with very encouraging results for us, while noting that as it is an observational study, controlled studies are required to define clinical efficacy.

Contrary to what was expected for this population in a context of social vulnerability and with a high percentage of clinical risk factors, severe and critical forms were rare and the fatality rate was lower than that registered in the general population.

Although these data cannot be attributed to any of the therapeutic measures taken, we believe that the early care and strict controls received could be the reasons that led to these results.

## Key points

Prisons worldwide had to be adapted to respond to the current COVID-19 pandemic in a vulnerable population.

There is little literature on the management and evolution of incarcerated patients diagnosed with COVID-19.

Unit 21 was the response to the demand for care in a vulnerable population with multiple risk factors in the context of deprivation of their ambulatory freedom.

Our study provides information about what measures were taken to face the pandemic and their effects based on the registered fatality.

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## Declarations

The authors declare that they have no conflicts of interest of any kind, that the work has been approved by the ethics committee responsible for the workplace and do not declare means of financing the work carried out.

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