

## Out-of-hospital care setting in a Febrile Emergency Unit of suspected Covid 19 patients

### Atención extrahospitalaria en una Unidad Febril de Urgencia de pacientes sospechosos de Covid 19

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#### What do we know about the subject matter of this study?

Implementation of hospital-wide changes in care strategies for patients with suspected COVID-19 should ensure the protection of both health care personnel and other patients.

#### What does this study contribute to what is already known?

The strategy of care in the Emergency Fever Unit (EFU) of the Pedro de Elizalde Children's Hospital from Buenos Aires, Argentina, facilitated access and optimized care circuits for pediatric patients with suspected COVID-19.

#### Abstract

In 2019, a new infection was reported in China. This coronavirus was named SARS-COV-2, causative of the 21<sup>st</sup>-century pandemic, COVID-19. Health systems adopted different strategies to cope with it. **Objective:** to describe the clinical-epidemiological characteristics of COVID-19 in children seen at an Emergency Febrile Unit (UFU). **Patients and Method:** Cross-sectional study in patients under 18 years of age tested for SARS-COV-2 between April 1 and June 30, 2020. All epidemiological records made at the time of consultation and the result of the Polymerase Chain Reaction (PCR) test of these patients, either by suspicion of COVID-19 or epidemiological isolation criteria, were included. Patients whose samples had been taken for SARS-COV-2 determination outside the initial time of consultation or whose epidemiological records were incomplete or did not meet the established inclusion criteria were excluded. The diagnosis of COVID-19 was made using the PCR technique for SARS-COV-2 in nasopharyngeal secretions obtained by nasopharyngeal swab or aspirate. The following variables were recorded: age, gender, place of residence, history of close contact, history of history of close contacts, travel history and comorbidities, history of institutionalization and PCR result. **Results:** 1,104 patients were admitted to the UFU and tested due to suspected COVID-19. 152 patients had to be excluded due to insufficient data. Of the 952 patients tested, 22.6% had a detec-

#### Keywords:

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table result, and 71.2% of them reported close contact with confirmed cases. The mean age was 5.9 years. The 55.4% were male and 99.3% lived in the Metropolitan Area of Buenos Aires. 72.8% of the patients tested had symptoms. The time of delay in consultation was 2.17 days. 25% of the children had comorbidities. **Conclusions:** The availability of the UFU facilitated access and optimized the care circuit in response to demand. Children with a history of close contact and those symptomatic showed more frequently a detectable result for SARS-COV-2.

## Introduction

Since mid-December 2019, a new coronavirus infection was reported in Wuhan, China, which rapidly spread to other countries<sup>1</sup>. From a sample collected from a patient's lower respiratory tract, on January 10, 2020, it was possible to isolate the virus and perform a genomic sequence that confirmed the emergence of a new coronavirus. On February 11, 2020, the World Health Organization (WHO) named this new disease COVID-19<sup>2</sup>. After assessing the distribution and number of cases, on March 12, 2020, WHO declared COVID-19 a pandemic.

COVID-19 disease has been most prevalent in adults and the proportion of cases reported in children under 15 years of age has been relatively low. In China, a study with a cohort of 44,672 COVID-19 cases reported that only 2% of patients were younger than 20 years<sup>3</sup>.

It is evident that all age groups are susceptible to SARS-CoV-2<sup>4</sup> infection, but in international publications, the clinical presentation and epidemiological history of adults have shown significant differences with children, which predominantly present mild cases and low mortality<sup>5</sup>.

Pediatric cases are mainly those occurring in households and most of them have epidemiological links with adult patients. Pediatric clinical manifestations are not typical and are relatively milder compared with adults<sup>6</sup>.

According to data from the Ministry of Health, as of 26 April 2020, 4,418 suspected cases of COVID-19 in children under 15 years of age had been reported in our country, of which 152 were positive cases and 4,266 were ruled out. By that time, the positivity rate reported in the pediatric population was 3.5%<sup>7</sup>.

The growing concern for the consultation of numerous symptomatic patients in the Buenos Aires Metropolitan Area (AMBA) led to the implementation of Emergency Fever Units (EFUs) in 20 hospitals in Buenos Aires, in order to avoid crowding at the hospital level and prevent viral spread in that area. Each one was composed of a reception and triage area, 4 consulting rooms, and 9 Transitional Isolation Units (TIUs). These outpatient facilities received those patients categorized as suspected cases, according to the updated definition and with mild symptoms.

Nurses received the patient and provided initial orientation, and then conducted the initial questionnaire to evaluate if the patients met the criteria to be attended in this area. After that, the children were referred to medical attention with the appropriate questioning, physical examination, and preparation of an epidemiological record.

The primary objective of this study was to describe the clinical-epidemiological characteristics of those patients admitted to the EFU of the *Pedro de Elizalde Children's Hospital* (HGNPE). The secondary objective was to report the experience in outpatient care of pediatric patients in this unit.

## Patients and Method

Cross-sectional study using the epidemiological records of children who were seen in the EFU of the HGNPE, due to suspected or confirmed cases of COVID-19 between April 1, 2020, and June 30, 2020.

We included all the epidemiological records made at the time of consultation of patients under 18 years of age and the results of the Polymerase Chain Reaction (PCR) test of them, either due to suspicion of COVID-19 or epidemiological isolation criteria, defined as patients who met close contact criteria in vulnerable neighborhoods or who presented hospitalization criteria due to other non-COVID-19 related causes. Patients who were sampled for SARS-COV-2 determination out of initial consultation time or whose epidemiological records were incomplete or did not meet the established inclusion criteria were excluded. In addition, the variables age, sex, place of residence, history of close contact, travel history, comorbidities, history of institutionalization, and PCR result were recorded.

The definition of a suspected case has varied according to the epidemiological situation. For identifying cases the definition by the Ministry of Health of the City of Buenos Aires was considered<sup>8</sup>.

The diagnosis of COVID-19 was made using the PCR technique for SARS-COV-2 in nasopharyngeal se-

cretions collected by swab or nasopharyngeal aspirate. The samples were collected at the time of the patient's consultation and sent immediately for processing.

The EFU was placed attached to the HGNPE during the first semester of 2020. The patients were considered those children between 0 and 18 years of age who consulted due to mild symptoms related to COVID-19. These patients were referred from triage performed in outpatient clinics, outpatient ward of the same hospital or operations carried out in the Autonomous City of Buenos Aires (CABA). Other patients consulted spontaneously. The Unit was open seven days a week from 8 a.m. to 8 p.m. and those patients who consulted after these hours and presented COVID-19-related symptoms were received at the hospital's Emergency Department.

The nursing staff was in charge of the admission to the EFU. The epidemiological record was registered by medical staff. Sampling was performed by pediatricians or kinesiologists by nasopharyngeal swabbing initially or nasal swabbing later, according to the updated standards of the Ministry of Health or by secretions aspiration in patients under 3 years of age. These samples were sent to the HGNPE laboratory for processing immediately after collection. After collecting the sample, the patient and the accompanying person could wait for the results in the TIU, be referred to the hospital ward, or be sent to hotels, depending on their possibilities of isolation and the updating of current ministerial regulations. Patients treated in the EFU and referred to the TIU remained there during the entire evaluation process, thus facilitating the care of other non-COVID-19 related pathologies in the rest of the hospital units and expedite processes due to the centralization of care in the same place.

### Ethical Aspects

In this study, informed patient consent was not applicable because the data were obtained from a routine epidemiological surveillance activity under the Argentine Law 15465/60. The study was approved by the Ethics and Research Committee of the HGNPE.

### Statistical analysis

For numerical variables, mean and standard deviation or median and interquartile range (IQR) were calculated according to their distribution (Kolmogorov-Smirnov test), and for the categorical ones, proportions and their 95% confidence intervals (CI).

### Results

From April 1 to June 31, 2020, 1,104 patients under 18 years of age were seen in the HGNPE EFU and un-

derwent PCR tests for SARS-COV-2. 152 individuals had to be excluded due to incomplete epidemiological records. Table 1 summarizes the demographic and epidemiological characteristics of all patients tested during the study period.

Data from 952 individuals could be analyzed; of which, 215 (22.6%, CI 95% 20.1-25.3) had a detectable result. Of the patients with a positive result, 71.2% reported close contact with COVID-19 positive cases.

Of the total number of individuals, 135 were tested in April, 249 in May and 568 in June. The PCR test positivity rate for each month was 0%, 27.3%, and 25.8%, respectively.

The mean age of the total of individuals tested was 5.9 years. 55.4% were male. 95.4% were Argentinian. The place of residence was 52.7% to the CABA and 46.6% to municipalities of the Province of Buenos Aires belonging to the AMBA. There were 253 (27.2%) asymptomatic tested individuals. Regarding the rest of those tested, 72.8% of the individuals presented with 1 or more symptoms at the time of consultation. Table 2 shows the frequency of symptom presentation.

The mean delay time in consultation in symptomatic patients was 2.2 days. 25% of the patients had comorbidities defined according to the criteria of the Ministry of Health. The most frequent were asthma (6.3%), immunosuppression associated with oncohematological disease (4.3%), neurological disease (4.2%), and type I diabetes and obesity (both 1%). The samples analyzed were obtained by nasopharyngeal secretion aspirate (22.7%) or nasopharyngeal swab (77.3%). Only 1 individual reported a history of travel during the two weeks before symptoms onset. At the time of consultation, 15 individuals lived in closed institutions. 26.5% of the individuals reported close contact with positive or suspected cases of COVID-19 and 110 individuals reported having consulted another health institution in the previous 14 days.

### Discussion

Currently, active epidemiological surveillance of COVID-19 is essential, as is the possibility of identifying the affected population groups and their characteristics. PCR test is the recommended diagnostic method for SARS-COV-2 in the surveillance of COVID-19 in the pediatric population<sup>10</sup>. This technique is simple, fast, and has adequate sensitivity and specificity. In this regard, it should be noted that the way the sample was collected did not show differences in diagnostic performance.

**Table 1. Demographic and epidemiological characteristics of children treated at EFU of Pedro de Elizalde Children's Hospital (n = 952)**

	Total number	Percentage
Sex		
Female	425	44.6
Male	527	55.4
Nationality		
Argentinean	908	95.4
Foreigner	44	4.6
Place of residence*		
CABA	502	52.7
GBA	444	46.6
Bs As province	6	0.6
Symptoms		
Asymptomatic	259	27.2
Symptomatic	693	72.8
Comorbidity		
Absent	714	75
Present	238	25
Sample		
Nasopharyngeal aspirate	215	22.6
Nasopharyngeal swab	736	77.3
Others	1	0.1
Close Contact		
No	700	73.5
Yes	252	26.5
Consultation in another institution		
No	842	88.4
Yes	110	11.6
Sample for epidemiological purposes		
No	699	73.4
Yes	253	26.6
PCR Results		
Positive	737	77.4
Negative	215	22.6

\*CABA: Autonomous City of Buenos Aires; GBA: Buenos Aires Metropolitan Area; PCR: Polymerase Chain Reaction.

In our series, 22.5% of the individuals seen at the EFU showed a detectable result. According to data from the Government of the City of Buenos Aires, the positivity rates in the total number of samples were 11% in April, 17% in May, and 27.75% in June, with a mean of 18.6%<sup>11</sup>.

The existence of the EFU allowed for optimal circulation of patients suspected of COVID-19. The possibility of receiving the children outside the hospital and keeping them in the EFU until the results were available, with exclusive personnel assigned to their care, was probably a decisive factor that prevented the spread and contagion within the hospital institution.

The strengths of this study are its methodological design and retrospective active surveillance based on solid epidemiological data. As a limitation, it was performed in a single EFU belonging to a tertiary care hospital, so the characteristics of the patients included should be considered if the aim is to extrapolate the results to the general population.

A significant number of patients who tested positive for SARS-COV-2 had been in close contact with suspected or confirmed COVID-19 patients and were symptomatic at the time of consultation.

These characteristics are useful data for the pediatrician when considering the suspicion of COVID-19. It is very important to maintain permanent surveillance in order to design the best strategies for the clinical and epidemiological management of the infection caused by this virus.

The existence of EFUs facilitated the reception and care of patients with symptoms compatible with the disease, ensuring the quality of care of these patients in the HGNPE of CABA. On the other hand, it allowed to distribute the circulation of patients within the institution, whether they have positive or negative test results, reducing the spread of this pathology among other patients and families, as well as among hospital staff.

**Table 2. Presentation of symptoms: Frequency**

	Total n = 952	Paciente con PCR Detectable n = 215
Asymptomatic	259 (27.2%)	75 (34.9%)
Fever	531 (55.8%)	82 (38.1%)
Respiratory symptoms (odynophagia, cough, dyspnoea, tachypnea)	132 (13.9%)	53 (24.6%)
Gastrointestinal symptoms (Diarrhea, abdominal pain, vomiting)	18 (1.9%)	2 (0.8%)
Others (Headache, dysgeusia, anosmia, rash)	12 (1.3%)	3 (1.2%)

## Ethical Responsibilities

**Human Beings and animals protection:** Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

**Data confidentiality:** The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

**Rights to privacy and informed consent:** This study was approved by the respective Research Ethics Committee, which, according to the study's characteristics, has accepted the non-use of Informed Consent.

## Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

## Financial Disclosure

Authors state that no economic support has been associated with the present study.

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