IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 6 Ser. 8 (June. 2024), PP 20-23
www.iosrjournals.org

Profile of Pediatric Care for Covid at the Municipal University Hospital Of Taubate-SP-Brazil (2020-2021)

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Abstract
Introduction*: SARS-CoV-2 presented milder clinical manifestations in the pediatric range than in adults. However, with the arrival of the new variants and the beginning of vaccination of the adult population, children have come to represent a higher percentage of hospitalizations.*
Objective: *To describe the care provided at the Municipal University Hospital of Taubate (HUT) by SARS-CoV-2 in 2020 and 2021.* ***Methodology*** *And retrospective cross-sectional study conducted through a survey of medical records of all visits to children under 12 years of age for SARS-CoV-2, confirmed by RT-PCR, from March 2020 to December 2021.* ***Results*** *In total, 198 children were assisted, seven (3.5%) in 2020 and 191 (96.5%) in 2021. The mean age of the patients was 4.7 years in girls and 4.5 years in boys. Children up to four years of age accounted for 56.1% (N=111) of the visits. The main symptoms presented by the patients were: fever (64.6%) and cough (64.1%). With emphasis on runny nose, dyspnea, diarrhea and vomiting, in children under four years, with statistical significance. The hospitalization rate was 12% (23 cases), of which 18 (9.1%) were admitted to the ward and 5 (2.5%) to the intensive care unit (ICU). All patients admitted to the ICU had comorbidities, and one (0.5%) died.*
Conclusion *The main symptoms presented were fever and cough. There was a large concentration of attendances in 2021. All patients admitted to the ICU had comorbidity.*
Keywords*: Coronavirus Infections, COVID-19, Pandemics, Child, Pediatrics*

Date of Submission: 10-06-2024 Date of Acceptance: 22-06-2024

I. Introduction

At the end of 2019, a new type of coronavirus called SARS-CoV-2 was discovered, causing a new disease called COVID-19. SARS-CoV-2 spread rapidly. Also known as the new era disease, the new coronavirus infection arrived in Brazil in February 2020, with the first case diagnosed in the city of São Paulo. In March 2020 the COVID-19 Pandemic was declared by the World Health Organization (WHO).(1,2).

Unlike other infections of the respiratory system, which are commonly more frequent and severe in childhood, SARS-CoV-2 developed milder clinical manifestations in pediatrics(3,4). A study by the Oswaldo Cruz Foundation (Fiocruz) that analyzed data from the Child Mortality Information System (SIM) of the Ministry of Health (MS) demonstrated that almost half of Brazilian children and adolescents killed by Covid-19 in 2020 were up to two years old age(5) and the mortality rate in children under one year of age, regardless of comorbidities, was 10.9 per 100,000 in children in 2021(6).

The Pan American Health Organization (PAHO) started to recommend measures to protect children from the direct and indirect effects of the Pandemic, as more than 1.9 million children had contracted COVID-19 in 2021(7) .With the beginning of immunization against SARS-CoV-2, concern increased in populations that had not been vaccinated, such as the pediatric population. With the emergence of new variants and as more adults were being vaccinated, children began to represent a higher percentage of hospitalizations worldwide(7). Therefore, the objective of this study was to describe the first two years of pediatric care for COVID-19 at a Municipal Hospital in the interior of São Paulo.

II. Methods

This is a retrospective cross-sectional study that was carried out using secondary data from information obtained from electronic medical records of pediatric care that occurred, in the first two years of the SARS-CoV-2 Pandemic, at the municipal University Hospital of Taubate (HUT) . Taubate is a municipality located in the east of the state of São Paulo, in a region known as Vale do Paraíba, at coordinates 23°01'S and 45°33'W, occupying an area of 624.9 km2. The resident population in the municipality is 320,820, of which 60,369 are under 14 years of age(8). The municipality's Human Development Index (HDI) is 0.800 and is considered above the average for the state of São Paulo (0.783)(9). The HUT has the largest emergency care unit in the city, and is the only hospital that admits children from the Unified Health System (SUS), a public health system.

The work was approved by the Research Ethics Committee of the University of Taubate under number 55609222.6.0000.5501.

The research began searching for medical records using the international classification of diseases (ICD-10), using the terms Pneumonia due to COVID-19 (cid. 10 J12.82), Multisystem inflammatory syndrome (MIS-C) with COVID-19 (cid. 10 M35.81), other specified systemic involvement of connective tissue with COVID-19 (cid. 10 M35.89) and COVID19 (cid. 10 M30). The authors received training to perform data collection in a standardized way. A standard form was used to extract data. All children under 12 years of age who had SARS-CoV2 infection, confirmed by RT-PCR, treated at Hospital from March 2020 to December 2021, were evaluated.

The variables studied were: sex, age, symptoms, presence of comorbidities, presence of contacts, presence of co-infection, results of laboratory tests, chest x-ray and chest tomography, treatment used and outcome. For possible comparability, ages were grouped into ages 0 to 4 years (Group 1) and ages 5 to 12 years (Group 2). Tables were created with the respective percentages and according to the age group with the respective proportions; the distributions of these age groups according to sex were estimated, with the respective proportions. When appropriate, the chi-square and Student's t tests were performed, considering an alpha significance level of 0.05.

III. Results

Between March 2020 and December 2021, 198 children aged 0 to 12 years old infected with SARS-CoV-2 were treated at HUT, all confirmed by RT-PCR. Of the 198 cases, 51.5% were male, with an average age of 4.7 years for girls and 4.5 years for boys. In 2020, only seven children were cared for, none of which required hospitalization.

In 2021, 191 patients were treated. Of these, 107 (56.1%) were up to four years of age and 84 (43.9%) were over 4 years of age. This year, 169 (88.4%) were discharged home, 17 (9.1%) were admitted to a pediatric ward and 5 (2.5%) were admitted to the Intensive Care Unit (ICU), of which one died. The main symptoms found are described in table 1.

Table 1. Main symptoms found in 198 patients with SARS-CoV-2 infection treated at HUT (2020-2021)

Symptoms	0-4 y age N=111 (%)	5-12 y age N=87 (%)	Total N=198 (%)	p
fever	70 (63,0)	58 (66,7)	128 (64,6)	0,59
cough	76 (68,5)	51 (58,6)	127 (64,1)	0,15
runny nose	60 (54,1)	35 (31,5)	95 (47,9)	**0,05***
headache	8 (7,2)	33 (37,9)	41 (20,7)	**<0,01***
odynophagia	6 (5,4)	27 (31,0)	33 (16,7)	**<0,01***
dyspnea	19 (17,1)	6 (6,9)	25 (12,6)	**0,03***
nasal congestion	16 (14,4)	9 (10,3)	25 (12,6)	0,39
diarrhea	21 (18,9)	3 (3,4)	24 (12,1)	**<0,01***
vomiting	16 (14,4)	4(4,6)	20 (10,1)	**0,02***

P chi square, * significance level

Regarding complementary tests, 52 blood count tests were performed, requested in 26.6% of cases, and considered altered in 11 patients (21.1%). Nine tests (17.3%) showed leukopenia and two tests (3.8%) showed leukocytosis. Chest radiography was performed in 91 (45.9%) of consultations and changes were found in 43 (47.3%) examinations, with reticulo-nodular infiltrates and signs of hyperinflation being described. Of the total number of patients treated, 89.3% (N=177) received some type of drug treatment (table 2).

Table 2. Treatments in 198 patients with SARS-CoV-2 infection treated at HUT in 2020-2021, stratified by age groups (Chi-square)

	0-4 y age N=111 (%)	5-12 y age N=87 (%)	Total N=198 (%)	p
Symptomatics (analgesics, antipyretics)	92 (82,9)	74 (85,0)	166 (83,8)	0,68
Antibiotics	53 (47,7)	36 (41,4)	89 (44,9)	0,37
Corticosteroids	44 (39,6)	21 (24,1)	65 (32,8)	**0,02***
Bronchodilators	26 (23,4)	12 (13,7)	38 (19,2)	0,09
Oxygen	12 (10,8)	5 (5,7)	17 (8,5)	0,20

P chi square, * significance level

Of the 198 patients with SARS-CoV-2 infection, 32 (16.1%) children with comorbidities were treated, of which 13 (40.6%) were hospitalized. Twelve children (37.5%) had Asthma, being the most common comorbidity and of these asthmatic patients, four patients (33.3%) were hospitalized. Other comorbidities found were neurological, heart diseases and chromosomal disorders.

Of the 23 hospitalized patients, 18 (81.8%) were under four years of age, with no statistically significant difference when compared with the hospitalization rate above four years of age. The average age of hospitalized patients was 3.5 years (range 0.1 to 8 years), with 14 (60.8%) being female, and there is no significant difference between male and female. The average length of stay was 8.4 days in patients up to four years old and seven days over five years old, with no statistically significant difference either. All five patients admitted to the ICU had comorbidities and received mechanical ventilation. Four of them underwent chest computed tomography, and in two (50%) there was a ground-glass image

One patient admitted to the ICU died.

IV. Discussion

The HUT Pediatrics Service monitored the first cases of the disease, in 2020, with a small number of visits and without any complications(10). However, in 2021, there was a significant increase in the number of cases, hospitalizations, complications and deaths. Based on the high proportion of asymptomatic infection, regular testing could have been used for surveillance of infections in schoolchildren, especially in cases of recent exposure. These public health interventions could mitigate the transmission of the disease in a period in which there was still no progress in vaccination coverage in children(11).

At the end of 2021, countries that had already started the vaccination schedule for children already described an inverse relationship between the immunization rate and hospitalization rates in the pediatric population. The Israeli Ministry of Health reported 512,613 children with SARS-CoV-2, which represented around 33% of all cases of the disease, with the disease predominating in the age group between five and 11 years of age(7).

Evidence to date shows that COVID-19 in children has certain characteristics compared to adults(11). The disease is generally asymptomatic or has mild manifestations. The innate immune response of children and the excellent capacity for regeneration of pediatric alveolar epithelium may have contributed to the milder and more favorable clinical expression of the disease(4). Understanding these differences in pattern of responses can help in the development of potential therapies and disease prevention strategies. However, serious cases requiring intensive care have been identified(12).

Although the clinical findings are diverse, fever and cough were the main symptoms described in all patients, with diarrhea, vomiting and runny nose in younger children and headache, odynophagia and dyspnea in older children. No skin lesions or neurological signs were described in the patients treated(13).

The most common laboratory findings were leukopenia in a small number of cases. The most frequent images observed in critically ill patients were ground glass, typically described in chest tomography(14,15).

The use of antibiotic therapy was common in all children treated, with no difference by age group. The use of corticosteroids was observed mainly in children under 4 years of age, probably due to the presence of wheezing in this age group. This drug, which is widely used in several pediatric conditions, was previously tested in SARS, MERS, flu and had no effect(16). The literature shows that these drugs can be indicated if the patient presents associated conditions responsive to corticosteroid therapy, in critical cases of COVID-19 and in the management of MIS-C(17).

The presence of pre-existing health conditions, such as chronic respiratory or cardiovascular disease, in children with SARS-CoV-2 infection significantly increases the risk of illness or ICU admission. In this study, all patients who were admitted to the ICU had comorbidities (neurological disease and chromosomal disorder) (13,14).

Multisystem Inflammatory Syndrome associated with COVID-19 is a condition described with a higher probability of ICU admission. Other rare, potentially serious conditions, such as thromboembolism, heart problems, kidney failure and type 1 diabetes, were also not observed in this study(2,18).

Therefore, there is a need to continuously collect data on COVID-19 in the child population to assess the real severity of the disease related to new variants, as well as potential long-term effects. There are immediate effects of the pandemic on children's health, and there is a need to identify and address the lasting impacts on the physical, mental and social well-being of this generation of children and young people. People over 6 months of age, with immunological problems and comorbidities, are priority groups for vaccination.

V. Conclusion

There was an increase in visits and hospitalizations for children and adolescents in 2021. The main symptoms found were cough and fever, with a runny nose, vomiting and diarrhea in children up to 4 years of age and headache, dyspnea and odynophagia in older children. Of the hospitalized patients, there was greater use of corticosteroids in younger children. There was frequent use of antibiotics.
All patients admitted to the ICU had comorbidities.

References

[1]. World Health Organization (WHO). Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected: interim guidance, 13 March 2020 [Internet]. Geneva: WHO; 2019; [acesso em 2020 Jun 05] Disponível em: https://www.who.int/publications-detail/ clinical-management-of-severe-acuterespiratory-infection-when-novel- -coronavirus-(ncov)-infection-is-suspected.

[2]. Lurie N, Saville M, Hatchett R, Halton J. Developing Covid-19 Vaccines at Pandemic Speed. New England Journal of Medicine. 2020 May 21;382(21):1969–73.

[3]. Swann O V, Holden KA, Turtle L, Pollock L, Fairfield CJ, Drake TM, et al. Clinical characteristics of children and young people admitted to hospital with covid-19 in United Kingdom: prospective multicentre observational cohort study. BMJ. 2020 Aug 27; m3249.

[4]. Rabha AC, Oliveira Junior FI de, Oliveira TA de, Cesar RG, Fongaro G, Mariano RF, et al. Clinical manifestations of children and adolescents with covid-19: report of the first 115 cases from Sabará Hospital Infantil. Revista Paulista de Pediatria. 2021;39.

[5]. LEVY B. Fiocruz analisa dados sobre mortes de crianças por Covid-19. https://portal.fiocruz.br/noticia/covid-19-mata-dois-menores-de-5-anos-por-dia-no-brasil. 2021.

[6]. Sena GR, Lima TPF, Vidal SA, Duarte M do CMB, Bezerra PGM, Fonseca Lima EJ, et al. Clinical Characteristics and Mortality Profile of COVID-19 Patients Aged less than 20 years Old in Pernambuco – Brazil. Am J Trop Med Hyg. 2021 Apr 7;104(4):1507–12.

[7]. Stein M, Ashkenazi-Hoffnung L, Greenberg D, Dalal I, Livni G, Chapnick G, et al. The Burden of COVID-19 in Children and Its Prevention by Vaccination: A Joint Statement of the Israeli Pediatric Association and the Israeli Society for Pediatric Infectious Diseases. Vaccines (Basel). 2022 Jan 6;10(1):81.

[8]. IBGE – INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Censo Brasileiro de 2010. Rio de Janeiro: IBGE, 2022.

[9]. IBGE Censo. Quantidade de famílias beneficiadas pelo Bolsa Família, Estimativa de Famílias Pobres - Dados de ago/2017, ago/2018, ago/2019 e fev/2020. . https://aplicacoes.mds.gov.br/sagi/vis/data3/v.php. 2023.

[10]. Santos A de OR dos, Lucarevschi BR, Bajerl MH, Pires L de O, Ubriaco DC, Nascimento LFC. SARS-CoV-2 infection in children and adolescents: a Brazilian experience. Revista Paulista de Pediatria. 2022;40.

[11]. Götzinger F, Santiago-García B, Noguera-Julián A, Lanaspa M, Lancella L, Calò Carducci FI, et al. COVID-19 in children and adolescents in Europe: a multinational, multicentre cohort study. Lancet Child Adolesc Health. 2020 Sep;4(9):653–61.

[12]. Silva ACSS da, Góes FGB, Silva LF da, Silva LJ da, Bonifácio MCS, Coelho YCCB. Children with congenital heart disease in COVID-19 pandemic times: an integrative review. Rev Bras Enferm. 2022;75(1).

[13]. Nehab MF, Menezes LA de. Impacto da covid-19 na saúde da criança e do adolescente. In: Covid-19: desafios para a organização e repercussões nos sistemas e serviços de saúde. Série Informação para ação na Covid-19 | Fiocruz; 2022. p. 241–51.

[14]. Xavier AR, Silva JS, Almeida JPCL, Conceição JFF, Lacerda GS, Kanaan S. COVID-19: clinical and laboratory manifestations in novel coronavirus infection. J Bras Patol Med Lab. 2020;

[15]. Ai T, Yang Z, Hou H, Zhan C, Chen C, Lv W, et al. Correlation of Chest CT and RT-PCR Testing for Coronavirus Disease 2019 (COVID-19) in China: A Report of 1014 Cases. Radiology. 2020 Aug;296(2):E32–40.

[16]. Safadi MAP. The intriguing features of COVID-19 in children and its impact on the pandemic. J Pediatr (Rio J). 2020 May;96(3):265–8.

[17]. Zimmermann P CN. Coronavirus infections in children including COVID-19: an overview of the epidemiology, clinical features, diagnosis, treatment and prevention options in children. Pediatr Infect Dis J. 2020;39:355–68.

[18]. Kam K qian, Yung CF, Cui L, Tzer Pin Lin R, Mak TM, Maiwald M, et al. A Well Infant With Coronavirus Disease 2019 With High Viral Load. Clinical Infectious Diseases. 2020 Jul 28;71(15):847–9.

[19]. Pan American Health Organization (PAHO). Atualização das Recomendações da OMS para vacinação contra COVID-19. Dados http://summary-table-covid-19-vaccines-sage-recommendations-sep2023-pt