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Coronavirus in pediatrics: report of two cases and review of the literature

Coronavírus na pediatria: relato de dois casos e revisão da literatura

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ABSTRACT

COVID-19 was identified on December 31, 2019 in China, and has since been the subject of several studies. In the area of pediatrics, the infection appears to affect this population group more mildly when compared to adults. The present work shows the report of two cases of in patients in the pediatric age group, both aged 2 years, presenting their laboratory, clinical and radiological aspects. In this population, the virus's transmissibility seems to be related to symptom presentation, as the less symptomatic the patient presents the lower is transmissibility. The final interest of the presented cases is to demonstrate the good evolution that both patients in the pediatric age group showed, directing attention to the normality of laboratory tests and the presentation with a wide variety of differential diagnoses.

Key words: pandemics; pediatrics; coronavirus infections; laboratories hospital.

RESUMO

A COVID-19 foi identificada no dia 31 de dezembro de 2019 na China e, desde então, tem sido objeto de diversos estudos. Na área da pediatria, a infecção parece afetar mais suavemente esse grupo populacional em comparação com os adultos. O presente trabalho apresenta o relato de dois casos de pacientes na faixa etária pediátrica, ambos com 2 anos de idade, mostrando seus aspectos laboratoriais, clínicos e radiológicos. Nessa população, a transmissibilidade do vírus parece estar relacionada com a apresentação dos sintomas, pois quanto menos sintomático o paciente se apresenta, menor a transmissibilidade. O interesse final dos casos relatados é demonstrar a boa evolução que os dois pacientes na faixa etária pediátrica apresentaram, direcionando a atenção para a normalidade dos exames laboratoriais e a apresentação com uma grande variedade de diagnósticos diferenciais.

Unitermos: *pandemias; pediatria; infecções por coronavírus; laboratórios hospitalares.*

RESUMEN

La COVID-19 fue identificada el 31 de diciembre de 2019 en China y ha estado bajo investigación desde entonces. La infección parece transcurrir de forma más leve en niños que en adultos. El presente trabajo muestra el reporte de dos casos de la infección con pacientes en la franja de edad pediátrica, ambos con 2 años de edad, presentando sus aspectos clínicos, radiológicos y de laboratorio. En esta población, es posible que la transmisibilidad del virus esté relacionada con la presentación de síntomas, ya que los pacientes menos sintomáticos tienen menor transmisibilidad. El interés final de los casos presentados es demostrar la buena evolución que ambos pacientes en el rango de edad pediátrico tuvieron, llamando atención para la normalidad de los testes de laboratorio y la presentación con gran variedad de diagnósticos diferenciales.

Palabras clave: *pandemias; pediatría; infecciones por coronavirus; laboratorios de hospital.*

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome virus coronavirus 2 (SARS-CoV-2). The disease, due to its impact upon the world scenario, was defined as a pandemic by the World Health Organization (WHO)[1]. In the pediatric population, the virus contraction normally happens by household exposure, generally with an adult as an index case[2]. There are cases associated also to diagnosis after exposure in healthcare settings[3].

This report of two cases aims to present laboratory, clinical, and radiological aspects of COVID-19 in two patients aged around 2 years, as well as the evolution of the disease in this epidemiological profile, correlating data with the world literature.

CASE REPORTS

Case 1

Patient aged 2 years and 5 months, male, with no previous morbidity, was taken to the emergency unit by his mother, with a 2-day fever (37.6°C) that relieved with antipyretics. He also had dry cough and developed diarrhea. At the physical examination, just tachypnea was noted as an alteration (RR: 42 bpm). Acute viral bronchiolitis was suspected. The patient's mother was instructed to perform a nasal saline lavage, keep the child outdoors in the fresh air, and return if the clinical picture persisted.

Three days later, the mother returned to the health service, reporting persistence of the disease. There was even presence of rhinorrhea and increase in the curve of the temperature measured at home (maximum 37.9°C); the patient did not present limitation of his daily activities. For a better understanding of the picture, laboratory tests and a chest radiograph were ordered. The radiograph did not show any important change in the posteroanterior plane, except for a peribronchial thickening (**Figure 1**). In the lateral plane (**Figure 2**), one could see a peribronchial thickening in the hilar region, of approximately 1 cm, more evident in the peritracheal region and in the major bronchi of the hilar region. The laboratory tests [upon admission, complete blood count, urea, creatinine, amylase, lipase, and C-reactive protein (CRP) were ordered] did not show alterations, but for a slight CRP increase (6.2 mg/dl). An oropharyngeal swab was obtained (COVID-19 rapid test), which proved positive. The subsequent confirmation of COVID-19 was provided by the in vivo reverse transcription-polymerase chain reaction (RT-PCR) assay, which was positive. The patient remained at home isolation,

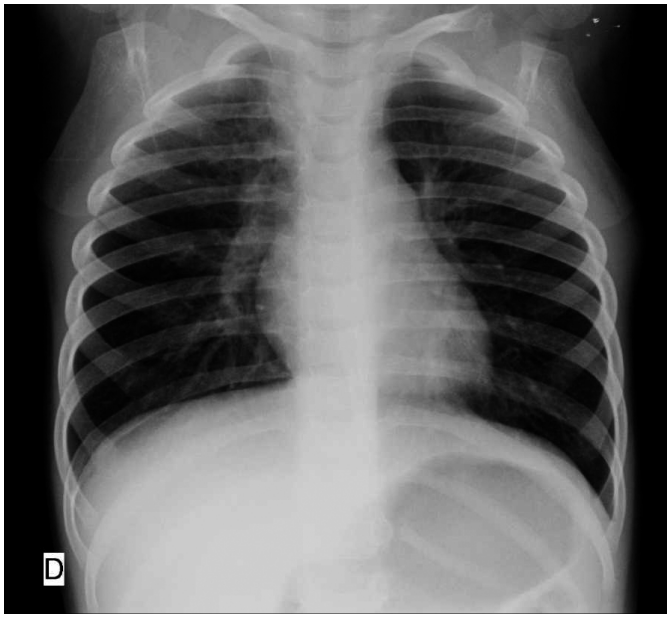

FIGURE 1 – *Posteroanterior chest radiograph*

Normal pulmonary transparency, clear costophrenic angles, bone framework with no alterations, cardiac area within normality, peribronchial thickening.

FIGURE 2 – *Lateral chest radiograph*

Peribronchial thickening in the hilar region, of approximately 1 cm, more evidente in the peritracheal region and the major bronchi of the hilar region.

separated from the other members as much as possible, at a ventilated environment, and presented good evolution. At the *in vivo* RT-PCR, the patient's parents had negative results. After 19 days and two exams performed at an interval lower than 24 hours for a sample of RT-PCR *in vivo*, both were negative for COVID-19. Patient and family had good evolution, with no evidence of contamination of the patient's parents by COVID-19.

Case 2

Patient aged 2 years and 1 month, male, with no previous morbidity, was taken to the emergency room by his parents with a 1-week episode of cough, fever (37.5°C), associated with fatigue in daily activities. At physical examination, the patient was active, reactive with shortness of breath, without other alterations. According to his parents, the fever was not relieved with the use of antipyretics. The diagnostic hypotheses of acute viral bronchiolitis, pneumonia, and COVID-19 were proposed. For a better enlightenment of the case, laboratory tests (complete blood count, creatinine, amylase, lipase, and CRP) and a chest radiograph were ordered. The posteroanterior and lateral chest radiographs (**Figures 3** and **4**) demonstrated peribronchial thickening in the major bronchi in the hilar region. We could not explore the possibility of interstitial pulmonary disease because of difficulty with the positioning technique due to patient movement during the examination. The test results were within the normal range. Nasal saline lavage was recommended, aimed at the conduction of a RT-PCR in vivo to detect COVID-19. Two days later, the patient's parents called the service to inform the test was positive and to ask for guidance. We recommended the patient remained in isolation, as much as possible. He needed the help of his parents for most activities in the period, remained at a ventilated environment, with constant hand-washing. Contact with the patient's secretions was avoided. After 21 days, repeating the RT-PCR test *in vivo*, the patient obtained a negative result. He evolved well, without major intercurrences and any signal of viral infection; there was no evidence of contamination of the patient's parents, what was confirmed by the negative RT-PCR of both.

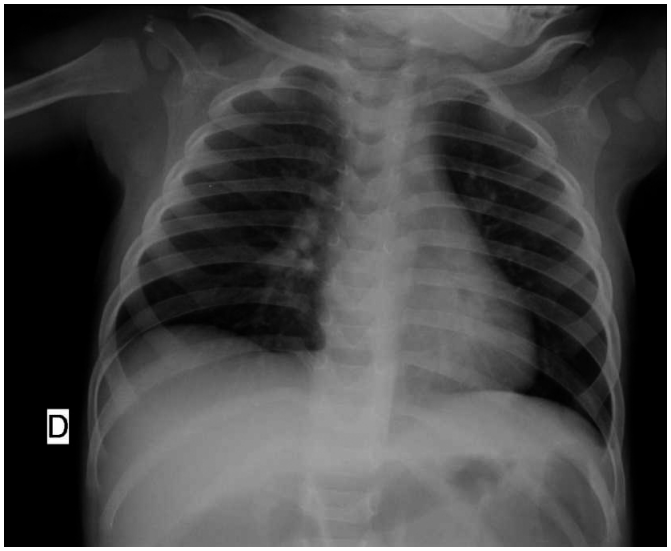

FIGURE 3 – *Posteroanterior chest radiograph*

Radiograph with normal pulmonary transparency, clear costophrenic angles, bone framework without alterations, cardiac area within normality, peribronchial thickening.

FIGURE 4 – *Lateral chest radiograph*

Radiograph with apparent peribronchial thickening presenting compromised technique due to patient movement during examination.

DISCUSSION

Covid-19 presents similar manifestations in adults and children, although children seem to display milder symptoms[4]. Children of all ages can be diagnosed with COVID-19, with higher prevalence in those aged 15-17 years and lower prevalence in those aged 1-4 years[5]. In both the presented cases, patients were in the age group of lower incidence of the pandemic and with mild symptoms that led to the possibility of other differential diagnoses.

Laboratory tests can show variations. A search in the literature revealed that blood count in most children has normal results. Still, cases with low count of leukocytes, neutropenia, and

lymphocytopenia were described. Elevated inflammatory markers, such as PCR (> 5 mg/dl) and aminotransferases were also described as laboratory findings[6]. In some observational studies, the raise of some inflammatory markers (for example, CRP, procalcitonin, interleukin-6, ferritin, D-dimer) was associated with more severe outcomes[4]. We can observe that in our first case, the CRP increased slightly; in the second, no laboratory alterations were found. Thus, one can notice that by the simple observation of laboratory tests, it was not possible to formulate the diagnostic hypothesis of COVID-19 for the pediatric age group in the presented cases.

The gold standard test for diagnosing COVID-19 is the RT-PCR sample. The oropharyngeal swab does not have the same accuracy[7]. In the first presented case, the RT-PCR test was used as a confirmation, as COVID-19 was not proposed as the first hypothesis. In the second case, due to the clinical suspicion, the option was the RT-PCR exam, what established the diagnosis of the infection.

Alterations in the image exams can be present even before symptoms appear[6]. Abnormalities in chest computed tomography (CT), such as ground-glass opacities and nonspecific unilateral and bilateral lesions, were described in the literature[6]. Ultrasound findings were also described, such as subpleural consolidations and individual or confluent B-lines[8]. In the cases here presented, chest CT was not carried out, as patients were in good general condition. In both cases peribronchial thickening was noted on chest radiograph, although we cannot confirm if that image alteration is related to diagnosis, because data compatible with this finding was not found in the literature about COVID-19.

One cannot clearly recognize the role of children in the transmission of COVID-19. Evidence suggest that transmission from children is low, possibly associated with the milder symptoms that children exhibit[9]. In both our reported cases, the closest household contacts (the parents of both children) were not contaminated during the patients' quarantine period or after their cure from COVID-19.

CONCLUSION

COVID-19 is a respiratory tract infection that can be fatal. The interesting fact of the reported cases is their presentation: both cases were found in routine situations of pediatric care, and ended up having diagnosis of COVID-19 with good evolution. In the literature, cases with similar outcomes are described. Even so the role of this pandemics is still uncertain in this age group, seemingly presenting good outcomes.

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