Images in pediatrics

Lobar pneumonia in pediatric patient with COVID-19

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1. Case presentation

A five-year-old previously healthy girl presented to the emergency department with a non-productive cough, fever, and vomiting for two days. She had no other symptoms apart from a few episodes of diarrhea, mild abdominal pain, and no definite COVID-19-exposure history. Leukocyte and lymphocyte counts were normal; the CRP level was increased (100 mg/L). Blood coagulation tests for SARS-CoV-2 was positive on the same day of admission. Blood oxygen saturation decreased rapidly soon after admission, with only 85–90% of the blood oxygen saturation being maintained on room air. She was connected to 2 L oxygen supply through a nasal cannula. At the same time, she was started on broad-spectrum antibiotics (ceftriaxone, vancomycin and azithromycin) and other supportive treatments (Intravenous Fluid Resuscitation). Nucleic acid testing for SARS-CoV-2 was positive on the same day of admission. Blood oxygen saturation decreased rapidly soon after admission, with only 85–90% of the blood oxygen saturation being maintained on room air. She was connected to 2 L oxygen supply through a nasal cannula. At the same time, she was started on broad-spectrum antibiotics (ceftriaxone, vancomycin and azithromycin) and other supportive treatments (Intravenous Fluid Resuscitation). The patient eventually responded well to management, inotropic support, and supportive treatments and was weaned off (saturation was 95–100% on room air), and she was discharged after 11 days of hospitalization.

2. Discussion

The SARS-CoV-2 (COVID-19) coronavirus is caused by an enveloped, single-stranded positive-sense RNA virus [1]. WHO have announced COVID-19 as a pandemic in March 2020 and since then, the number of cases of confirmed COVID-19 increased globally and more children being affected. Scientists have been exploring measures of treatment and transmission prevention. Moreover, the pathogenesis, variability of symptoms and mode of transmission are poorly understood [1]. The clinical manifestations, chest images and laboratory tests for pediatric COVID-19 infection are non-specific and similar to influenza or other chest infections [2,3].

The chest radiography in symptomatic children with positive COVID-19 could be normal. Nevertheless, wide spectrum of non-specific findings reported [1,2]. The most common findings were peribronchial cuffing and perihilar opacity [3]. The patchy bilateral ground-glass opacity (GGO), consolidation, or both were also reported [1,3]. The distribution of the abnormality could be unilateral or bilateral with peripheral and lower lung zone predominance. Lobar pneumonia is atypical disease presentation [1].

Computed tomography of the chest showed bilateral peripheral and/or subpleural ground-glass or consolidative opacities often in the lower lobes of the lungs. Three phases of the disease were identified in chest CT-scan [2,4].

Early phase: Focal consolidation with a rim of surrounding ground-glass opacity “halo” sign.
Progressive phase: progresses to ground-glass.
Developed phase: consolidative opacities.

In the current pandemic, the International Expert Consensus on COVID-19 imaging by Lee E and his group stated that “when you image a pediatric patient suspected of COVID-19 infection, you should consider the sensitivity and specificity of imaging studies, the availability and accuracy of real-time polymerase chain reaction
(RT-PCR) tests, and potential radiation dose. Chest CT in pediatric patient required balance between the risk of radiation and necessity for chest CT; it only needed in sick patients while follow-up imaging should be limited for deteriorated cases only [2,5].

References

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Fig. 1. Chest X-ray demonstrates airspace opacity in the right lower lobe and middle lobe partially silhouetting the right cardiac border with air bronchogram consistent with pneumonia.