

Case Report

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Covid-19 and Acute Lymphoblastic Leukemia: A Pediatric Case Report

Karla Solorzano Sabando¹, Jessica Alchundia Moreira^{1*}, Katiuska Moreno Peñarrieta¹ and Richard Cedeño Mera²

¹Hospital de Especialidades Portoviejo, Ecuador

²SOLCA Portoviejo, Ecuador

*Corresponding author

Jessica Krupskaja Alchundia Moreira, Hospital de Especialidades Portoviejo, Ecuador. Tel: +593 939973245;

E-mail: dra.jessicaneumoinfantil@gmail.com

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Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) infection in children is generally associated with an asymptomatic presentation or with benign self-limited respiratory disease, there are few reports of severe disease and mortality. Pediatric cancer patients undergoing chemotherapy are considered as a population vulnerable to complications associated with COVID-19, however little has been described of the course of the disease in them [1, 2].

Case Report

Twelve-year-old girl, diagnosed a year ago with Common Acute Lymphoblastic Leukemia Type B with High-Risk staging (B-ALL HR).

24 hours after completing the second block of the reinduction phase, she began with fever, dry cough, and general malaise. She is admitted to the hospital on the sixth day of symptoms with a diagnosis of Febrile Neutropenia and hypoxemic acute respiratory failure. Initial laboratory tests show a white blood cell (WBC) count of 310/μL with an absolute neutrophil count of 222.8/μL, a hemoglobin level of 6.8 g/dL, a hematocrit (HCT) value of 20.2%, a platelet count of 31000/μL, an erythrocyte sedimentation rate (ESR) value of 22mm/h, a blood pH value of 7.62, a PO₂ value of 58 mm/Hg, a PCO₂ value of 30.1 mm/Hg and a Potassium (K) value of 2.3 mEq/L (severe neutropenia, thrombocytopenia, severe hypokalemia, respiratory alkalosis); SARS- CoV-2 antibody test negative for IgG and IgM and test for SARS-CoV-2 detection by real-time reverse transcription-polymerase chain reaction (RT-PCR) in negative pharyngeal swab specimen. Her chest x-ray reveals a sparse pattern of multifocal subpleural ground glass.

She receives empirical antibiotic therapy with piperacillin-tazobactam and amikacin. At 48 hours she worsens clinically, RT-PCR SARS-CoV-2 is repeated in a pharyngeal swab sample with a positive result, and a chest computed tomography scan (CT) reveals multifocal subpleural ground-glass pattern and some areas of consolidation with air bronchogram in both lung bases; Severe Covid-19 Infection is diagnosed, treatment with oral chloroquine, subcutaneous enoxaparin, Filgrastim is started and the antibiotic scheme is rotated to Meropenem + Vancomycin.

She improves clinically, although on the fifth day of hospitalization (11 total days of symptoms) she presents worsening of her clinical condition with the requirement of pediatric intensive care with high-flow ventilation, increased inflammatory parameters in laboratory analysis (ESR: 102mm/h, Ferritin: 8831 ng/ml, D-Dimer: 490 ng/ml, CRP: 32mg/l, Interleukin-6: 289 pg/ml) and chest X-ray worsening, is then considered as Cytokine Storm Syndrome associated with COVID-19 and treatment with Tocilizumab (TCZ: monoclonal antibody against IL-6 receptor) is started at 8mg/kg in a single dose. Endovenous antibiotic therapy is maintained for 14 days and oral chloroquine for 7 days. No side effects of Tocilizumab were recorded.

The patient completed 21 days of admission and hospital discharge was decided with a normal physical examination plus RT-PCR CoV2 SARS negative. Prior to discharge in imaging studies (CT and chest X-ray), a mixed pattern is seen that compromises 70% of the lung parenchyma; however, 8 weeks after discharge, a new chest CT scan was performed with almost complete resolution of the lesions, with only small areas of ground glass persisting in the right lower lobe. Currently, the patient is restarting her chemotherapy regimen.

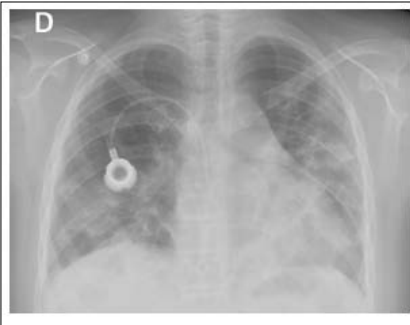
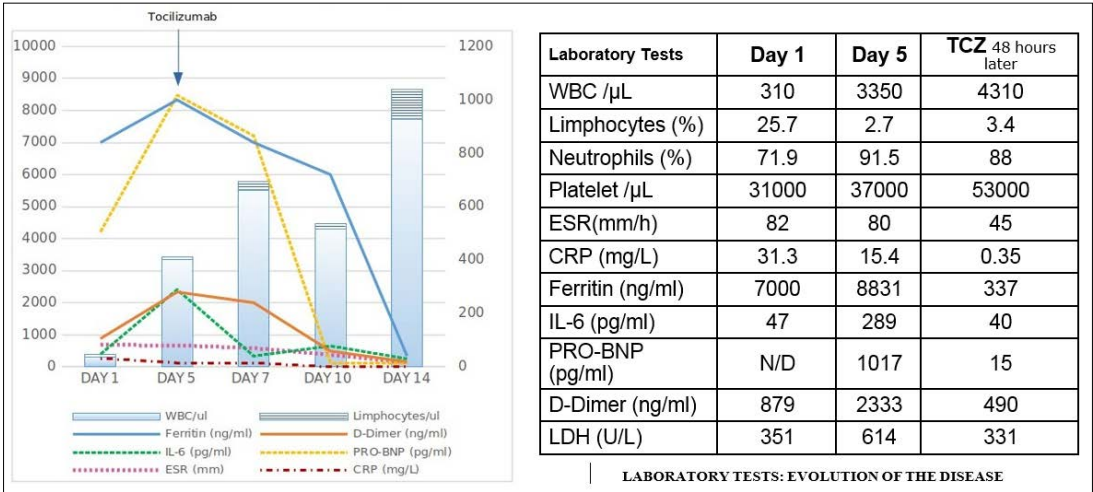


Figure 1: Chest radiograph on hospital admission

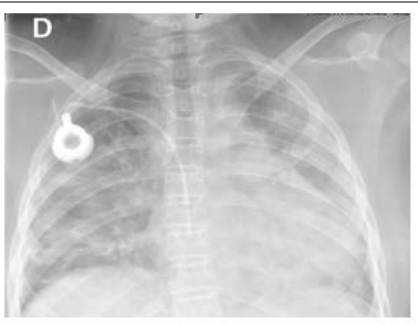
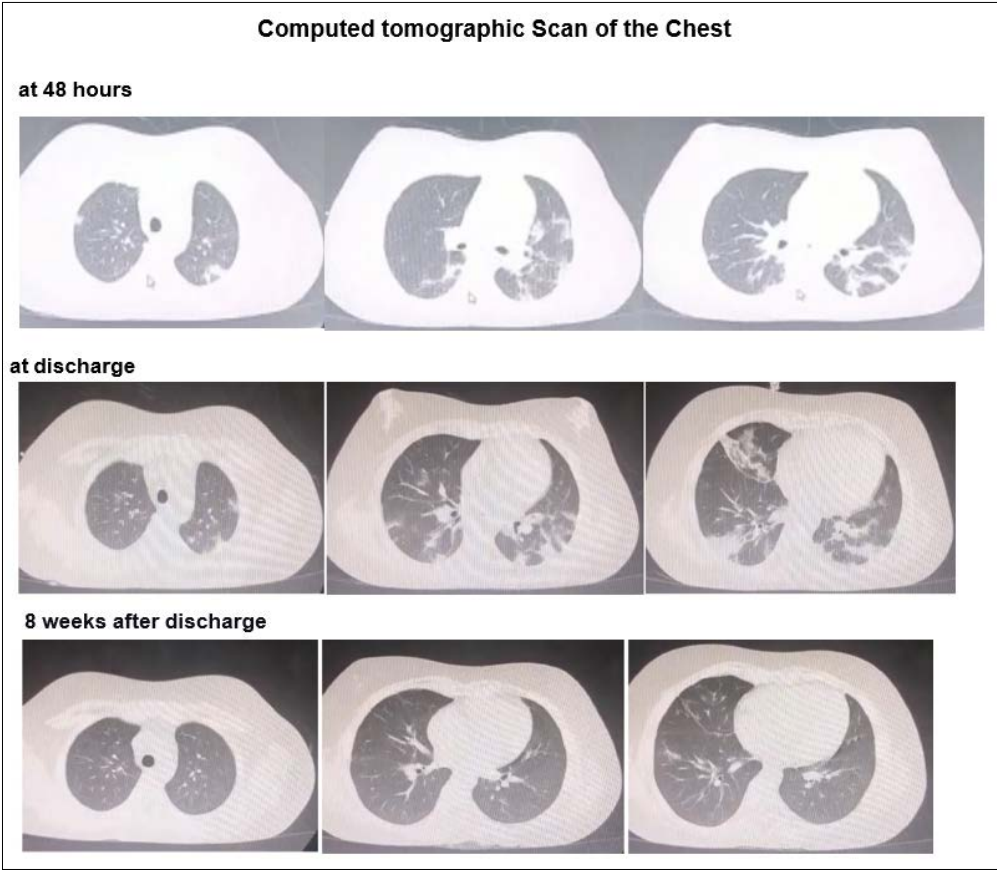


Figure 1: Chest radiograph on day 5



Conclusions

The exposed case coincides with few reported cases of Covid-19 in pediatric and adult patients with pre-existing onco-hematological pathologies, in which severe forms of the disease with great pulmonary involvement and cytokine storm syndrome are manifested. Due to limited information, it is still unknown whether this inflammatory process is more common in children with acute lymphoblastic leukemia who have SARS CoV-2 infection. In this context, in children with cancer who are imminently susceptible to developing severe COVID-19, the early use of tocilizumab should be considered [1, 3-5].

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