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BRIEF COMMUNICATION

Rapid improvement of a critically ill obstetric patient with SARS-CoV-2 infection after administration of convalescent plasma

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SYNOPSIS

Convalescent plasma may improve outcomes in critically ill pregnant women with SARS-CoV-2 infection who have rapid deterioration of respiratory function and seronegative status.

KEYWORDS

Convalescent plasma; SARS-CoV-2; Pregnancy

SARS-CoV-2 (COVID-19) infection in pregnancy increases the likelihood of hospitalization, admission to intensive care, and receipt of mechanical ventilation as compared with nonpregnancy [1]. On June, 21, 2020, a 33-year-old pregnant woman (27⁴ gestational weeks) with SARS-CoV-2 infection presented to Hospital San José Tec Salud, Monterrey, México, with respiratory distress and oxygen saturation below 90% (room oxygen). She had developed fever, asthenia, adynamia, myalgia, dry cough, anosmia, and diarrhea 7 days prior to admission. Her past medical history was significant for smoking, which she had stopped at 4 gestational weeks.

On admission, the woman was treated with oxygen therapy (8 L/min) via a nasal cannula; chest X-ray showed bilateral interstitial infiltrates. Laboratory data revealed leukopenia with lymphopenia, raised interleukin-6 and C-reactive protein, and compensated respiratory alkalosis (Figure 1).

Therapy was initiated with enoxaparin (60 mg), azithromycin (250 mg), ceftaroline (600 mg), lopinavir/ritonavir (400 mg/100 mg), methylprednisolone (40 mg), and supportive care (antipyretics, analgesics, fluids, and nutrition). On hospital day 2 (HD2), saturation

decreased and chest X-ray showed an extension and worsening density of interstitial infiltrates. On HD3, the woman was intubated and placed on mechanical ventilation; intermittent pressure support with intravenous ephedrine was provided as needed owing to intermittent periods of hypotension and bradycardia. Continuous fetal heart rate monitoring was non-reassuring. Serum IgG against SARS-CoV-2 was undetectable. Despite medical treatment, her condition continued to deteriorate. A multidisciplinary team discussed the case and the possible therapeutic interventions. We sent a request to the hospital Bioethics Committee for compassionate use of convalescent plasma. The request was approved. Methylprednisolone was discontinued and prenatal corticosteroid therapy was initiated. The treatment plan and options were discussed with the patient's legally authorized representative who consented to proceed with the administration of convalescent plasma.

Two doses of convalescent plasma from a compatible donor with confirmed anti-SARS-CoV-2-IgG were transfused (24-hour interval, HD4–HD5). Prepartum testing for fetal well-being was reassuring both before and after each transfusion, and no adverse effects were identified. An improvement in oxygen requirement was noted on HD6. On HD7, the woman passed a trial of spontaneous breathing and was placed on non-invasive positive pressure ventilation; ritonavir/lopinavir and azithromycin were discontinued. She was placed on supplemental oxygen via a nasal cannula on HD9, and successfully transitioned to room air on HD12. On HD14, she was discharged from the hospital. A week later, chest X-ray showed absence of bilateral interstitial infiltrates and anti-SARS-CoV-2 IgG was detected. At gestational week 39, a female neonate with growth restriction was delivered vaginally; growth restriction has been previously associated with SARS-CoV-2 infection in pregnancy [2].

Administration of convalescent plasma is associated with maternal survival [3,4]. Convalescent plasma may be a safe alternative for pregnant women who have rapid deterioration of respiratory function and a seronegative state in which the fetus shows distress parameters.

AUTHOR CONTRIBUTIONS

The patient in this case study was supervised by GM, CV, SC, MM, JC, and SS. DD and SC were involved in recruitment of the convalescent plasma donor. CV, GM, and DD wrote the final manuscript.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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FIGURE LEGENDS

Figure 1. Clinical progress of a critically ill obstetric patient with SARS-CoV-2 infection after administration of convalescent plasma. A 33-year pregnant patient (27⁴ gestation weeks) with SARS-CoV-2 infection developed acute respiratory deterioration despite administration of antiviral, antibiotic, and corticosteroid therapy. She was treated with two doses of convalescent plasma, resulting in an improvement in respiratory parameters and inflammation markers, and a consecutive radiologic improvement in lung appearance.

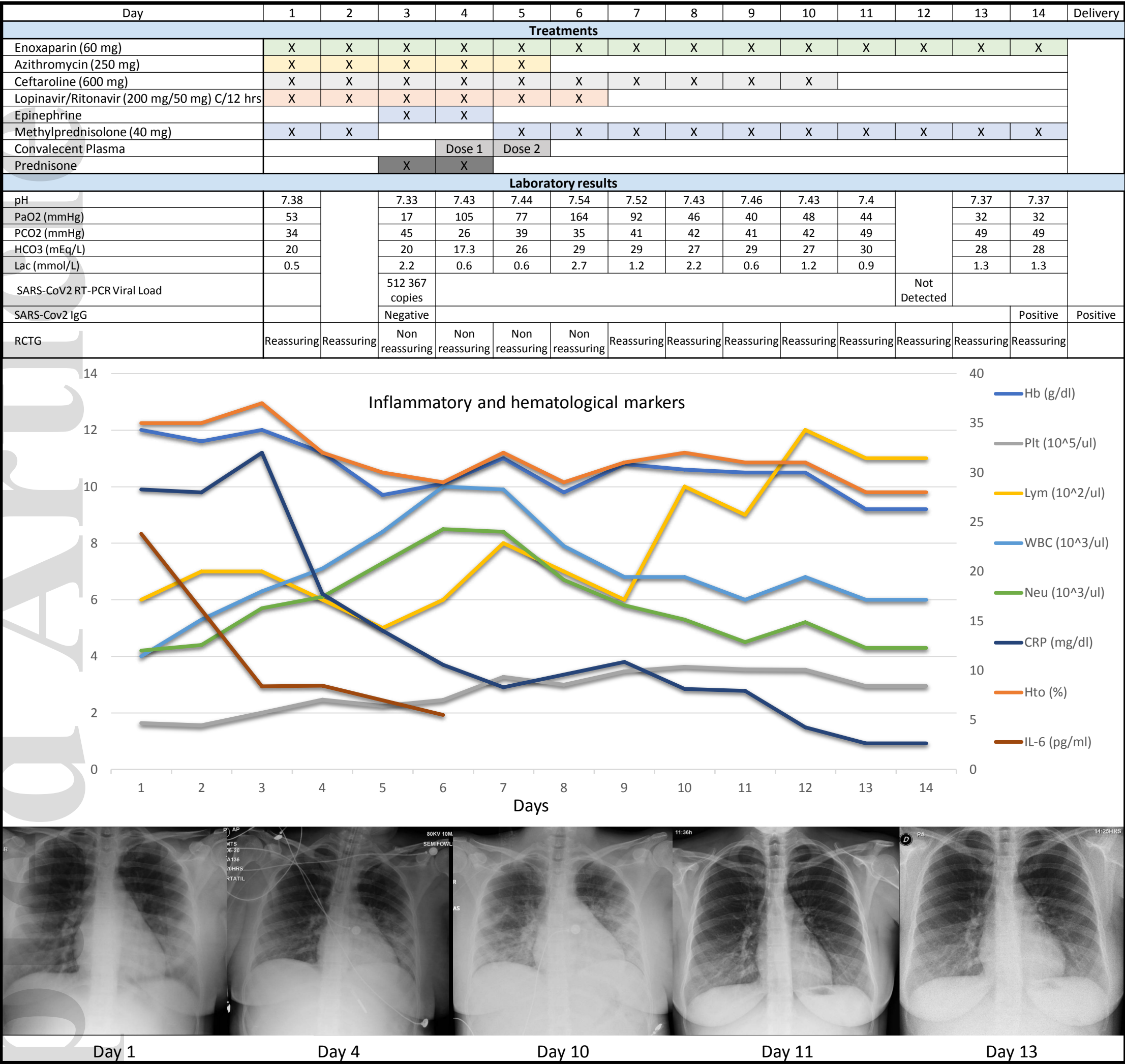


Figure 1. Critically ill obstetric patient with SARS-CoV-2 infection evolution after administration of convalescent plasma.