| Case Report |

Severe COVID-19 infection in a 32 weeks pregnant woman successfully treated with convalescent plasma therapy

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Article Info

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Abstract

From the beginning of corona virus disease 19(COVID-19) pandemic, there has been concern how to protect vulnerable group like pregnant women from severe acute respiratory syndrome corona virus 2(SARS-CoV-2). Historically, pregnant women experiences increased mortality during any pandemic situation. Pregnant women show almost the similar clinical features as that of non-pregnant adults with COVID-19 infection. Different systematic reviews have begun to focus light on pregnancy outcomes in COVID-19 patients, but knowledge is very limited and still the basis is case series and individual experiences. Apart from the scientifically proven therapeutic options used in COVID-19 such as steroid, low molecular weight heparin, the role of convalescent plasma therapy (CPT) has never been evaluated. We present a case of a pregnant woman of 32 weeks of conception, treated with CPT with favourable outcome in a private hospital of Dhaka, Bangladesh.

Introduction

At the end of 2019, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a virus causing coronavirus disease (COVID-19) emerged in China followed by a rapid spread of the virus, leading to the announcement of a COVID-19 pandemic by world health organization (WHO).[1] As there was no vaccine available in the last year, convalescent plasma therapy (CPT) was recommended in the different countries to tackle COVID-19 associated morbidity and mortality. Common presentations of COVID-19 are fever, cough, headache, dyspnoea, malaise, loss of smell and taste. Few patients present with respiratory distress, septic shock, multi-organ failure, and disseminated intravascular coagulation (DIC).[2] Amongst the patient with COVID-19, 85-90% has no or mild symptoms, about 5-10% have symptoms severe enough to need hospitalization and at times oxygen therapy. Only about 1-2% develops critical disease requiring mechanical ventilation and often leading to death. Different comorbidities like diabetes, hypertension, chronic kidney diseases, heart diseases, and malignancies exacerbate the disease, especially in older patients and pregnant women.[2,3] The pregnant women suffering from severe COVID-19 usually left with not many specific treatment options like an antiviral, mono-clonal antibody, colchicine, Regeneron's antibody cocktails etc.

Case Presentation

A 29-years-old pregnant lady (primi gravida and 32 weeks of gestattion) came to us with fever for 7(seven) days followed by severe respiratory distress for 2(two) days. On general physical examination she was found febrile, tachypneic, tachycardic and hypoxic, measured oxygen saturation was 86% in room air. Blood pressure was 130/80 mm of Hg.

Systemic examination revealed, crackles on the both lungs base, no additional breath sound, no murmur, no organomegaly, no enlarged lymph nodes were palpable. RT-PCR for COVID-19 was positive (CT value: 20). So, on admission she was diagnosed as a case of severe COVID-19 with 30 weeks of pregnancy. All her biochemical investigations are shown in table-I.

Following hospital admission, oxygen therapy was given through nasal cannula with paracetamol for fever and nebulization

Table 1

Biochemical parameters of the patient before and after convalescent plasma therapy

Test	Before CCP	After CCP
D-Dimer	1.042 mg/l	0.6 ng/ml
C-reactive protein(CRP)	108.0 mg/l	5.22 mg/l
S. ferritin	123 ng/ml	88 ng/ml
Hemoglobin	12.1 gm/dl	11.8 gm/dl
Erythrocyte sedimentation rate	34 mm in 1st hour	52 mm in 1st hour
WBC	6000/cumm	4000/cumm
Platelet count	1,40,000/cumm	2,21,000/cumm
Eosinophil(%)	2%	1%
Neutrophil(%)	72%	66%
Lymphocyte(%)	26%	27%
Monocyte(%)	4%	6%

with bronchodilator. As she was in third trimester of the pregnancy, so no antiviral could be given. Her oxygen demand was increasing and reached 15 liter per min with non-re breather mask. So, decision was taken for using CPT therapy from suitable donor. A 200ml CPT was given after screening and cross-matching. The plasma was taken by Spectra Optia Apheresis System (USA) and ELISA was done by Euroimmun (Germany) which OD value was 4.8.

Oxygen demand gradually lowered down and she feel comfortable with 5 l/min oxygen on day 3(three) of CPT. Oxygen therapy was discontinued one day later. Later on she delivered a baby by caesarean section at full term.

Discussion

Pregnant women are more susceptible to severe manifestations of infections, including corona virus disease 19(COVID-19), probably due to changes in the immune system and physical stature.[4]

Chen *et. Al.* [4] reported nine pregnant women of COVID-19 in the third trimester with an improved clinical course during hospitalization without complications. On the other hand, Liu *et. al.* [5] investigated thirteen pregnant women with COVID-19 and reported that during the study period, six of these patients were transferred to the intensive care unit. Karami *et. al.* [3] reported a 27-year-old pregnant woman at 30 weeks and third gestation with COVID-19 and a deteriorating clinical course that subsequently died due to multi-organ failure. Our patient was fortunate enough that though her condition initially deteriorated but later she had significant improvement with the CPT therapy.

Amongst the therapeutic options used in COVID-19 such as anti-viral drugs, tocilizumb, anti-malarials, none of them have been effective clearly.[6,7] A study done in Iran showed therapeutic efficacy of CPT.[8] The use of CPT is based on developing passive immunity in the body so, FDA approved it to use in COVID-19.[9] In one study it is found that single dose of CPT used in 10 patients showed significant improvement clinically at day 3(three) and radiological improvement at day 7(seven).[8] Another study showed CPT saved 6451 lives during the early part of the infection.[10] The CPT can help to prevent shifting of the patient to ICU and slow the progression of the disease at the early stage but can't reduce the mortality.[11] In one individual case report, CPT showed dramatic improvement of the clinical and radiological features in pregnant woman with COVID-19. But data is scarce regarding use of CPT in pregnant woman.[12] This patient is also another example of benefit of CPT in COVID-19 specially in pregnancy. The challenges of transfusion mediated infection was managed by routine screening and leuco-depleted filter was used to prevent hazard of blood transfusion in this case.

Conclusion

The mortality of COVID-19 in pregnancy is high. Moreover, minimum proven therapeutic options are available in pregnancy to treat COVID-19. So, use of CPT could be a good option to be tried ion large scale.

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