

# COVID-19 in Pregnant Patient with Thrombotic Microangiopathy: A Case Report

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## Abstract

There is some evidence that viral infection can play an important role in developing hypercoagulable state leading to thrombosis. One of most important effect is developing Thrombotic Microangiopathic Anemia (TMA) which is related to direct endothelial injury by virus or antigen-antibody complex. Other etiologies for developing TMA are drugs, pregnancy and etc. Here we report a case with pregnancy and COVID-19 infection led to TMA.

**Keywords:** COVID-19 • TTP • Plasma exchange

## Introduction

A 25 year old woman delivered with EMS to our hospital emergency department. She was in the third trimester near the term of her third pregnancy. Her chief complaint was headache, nausea and also sudden bilateral blurred vision. In her history there wasn't any previous medical or surgical history. She had two aborted pregnancy in 8 and 6 weeks of first trimester respectively, however due to poor socioeconomic status she didn't follow. Her vital sign was T: 38.5 axillary, PR: 110, BP: 100/70 and RR: 22. She was lethargic and had lots of petechiae and purpura in her lower limbs and also wet petechiae in her palate. Fine crackles in base of both lungs and coarse crackles in periphery were heard. Abdominopelvic exam was normal. Due to lack of cooperation neurological exams were not done [1,2].

## Case Report

In her lab data we found leukocytosis 22000 with PMN dominance about 90%, Hb 7 with MCV 105 and also thrombocytopenia about 15000. We see numerous schistocytes in peripheral blood smear. Other laboratory data shown abnormal liver function test with hepatocellular pattern (AST=680, ALT=150, ALP=420) and also indirect hyperbilirubinemia (Bili T=4 and Bili D=0.4), LDH was absolutely high about 3465 and plasma creatinine was increased about 2.1 due to dehydration and evidence of hemolysis. Urine analysis was compatible with hemolysis. Coagulation tests were normal and also fibrinogen FDP. D-Dimer was positive due to pregnancy. Lung CT-Scan shown patchy infiltration in both lungs compatible with COVID-19. COVID-19 PCR test was positive. Brain CT-Scan was also normal. We started INF-Beta for 5 doses based on our hospital protocol. According to signs of hemolysis, thrombocytopenia, renal failure, abnormal LDH, lethargy and numerous schistocytes on PBS we decided to start plasma exchange with FFP immediately. We consulted with gynecologist for termination of pregnancy due to suspicion for HELLP syndrome, because differentiation between HELLP and TTP was difficult with these signs and symptoms the gynecologist decided to terminate the pregnancy. Due to probability of acquired TTP, ADAMTS-13 activity and

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antibody was checked, its levels were lower than 10% and 85 IU/ml (Normal level less than <15) respectively. We continued plasma exchange daily and also started Dexamethasone 8 mg/IV/BD. With termination of pregnancy and continuing plasma exchange, the level of consciousness increased gradually, LDH gradually decreased and in following peripheral blood smear schistocytes disappeared. Serum creatinine began to decrease with hydration and plasmapheresis and finally became normal. Bilirubin decreased in subsequent days. Finally after 20 days of hospital admission hemoglobin and platelets became normal, LDH, renal and hepatic function also became normal. Her following CT-Scan showed resolved dramatically (Figures 1 and 2).

## Discussion

This year COVID-19 affected more than 25 million people worldwide. In Iran we had 2 peaks of epidemics which affected our people in several clinical fashions [3]. During the first outbreak patients almost had respiratory symptoms from mild fever and cough to severe distressing dyspnea between the two ends

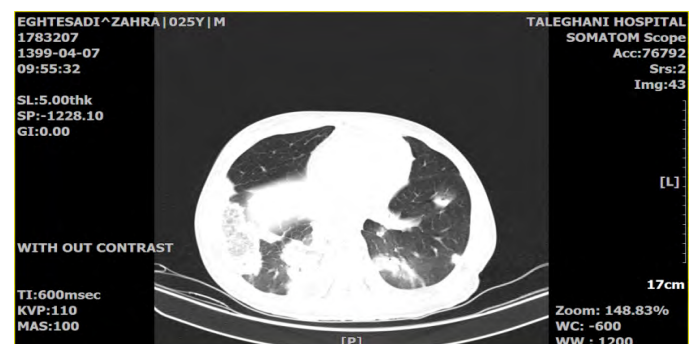


Figure 1. Lung CT-scan in first day of admission.



Figure 2. Lung CT-scan in 1 week later.

of the spectrum. In recent outbreak in addition to respiratory symptoms we saw several gastrointestinal symptoms such as nausea, vomiting and diarrhea. In Iran several infectious committee planned to administer antiviral agents such as INF-Beta or a combination of Lopinavir and Ritonavir for assessing the response to therapy [4]. Our patient was a pregnant woman with moderate to severe hemolysis and thrombocytopenia which we put her in microangiopathic groups of hemolytic anemia and we confirmed it with ADAMTS-13 level and response to daily plasma exchange. As we know there are several clinical entities which fall into microangiopathic hemolytic anemia such as HELLP, TTP, HUS, DIC, Scleroderma renal crisis, catastrophic antiphospholipid syndrome and etc. In this patient HELLP, TTP and catastrophic APS were at the forefront of differential diagnosis [5]. As there are so many clinical and paraclinical overlap between them, the exact distinction usually based on probabilities [6]. In this case the patient had not hypertension so HELLP may be unlikely; however with respect to critical general condition the gynecologist terminated the pregnancy. The recovery course of hemolysis and platelet count was lower after pregnancy termination than HELLP induced cytopenias, which expected to recover faster than we seen in this patient. Our patient responded well in consecutive daily plasma exchange [7-10]. Catastrophic APS usually respond to IVIG therapy, based on her previous history of first trimester abortions we requested antiphospholipid antibodies panel. All of them were negative.

## Conclusion

In conclusion we reported a pregnant woman in her third trimester with microangiopathic hemolytic anemia which associated with COVID-19 infection. This was the third case of COVID-19 associated TTP.

## References

1. Amanda K. Davis, Robert S. Makar, Christopher P. Stowell and David J. Kuter, et al. "ADAMTS13 Binds to CD36: A Potential Mechanism for Platelet and Endothelial Localization of ADAMTS13." *Trans* 49 (2009): 206-213.
2. Moake, Joel. "Thrombotic Microangiopathies." *N Engl J Med* 347 (2002): 589-600.
3. Wei-Jie Guan, Zheng-Yi Ni, Yu Hu and Wen-Hua Liang, et al. "Clinical Characteristics of Coronavirus Disease 2019 in China." *N Engl J Med* 382 (2020): 1708-1720.
4. Pooya Payandemehr, Morteza Azhdarzadeh and Hooman Bahrami-Motlagh. "Interferon Beta-1a as a Candidate for COVID-19 Treatment: An Open-Label Single-Arm Clinical Trial." *Ad J Emerg Med* 4 (2020): 51.
5. James N. George, Carla M. Nester and Jennifer J. McIntosh. "Syndromes of Thrombotic Microangiopathy Associated with Pregnancy." *Hematol Am Soc Educ Prog* 1 (2015): 644-648.
6. Evaren E. Page, Johanna A. Kremer Hovinga, Deirdra R. Terrell and Sara K. Vesely, et al. "Thrombotic Thrombocytopenic Purpura: Diagnostic Criteria, Clinical Features, and Long-Term Outcomes from 1995 through 2015." *Blood Adv* 1 (2017): 590-600.
7. Tsai, Han-Mou. "Current Concepts in Thrombotic Thrombocytopenic Purpura." *Annu Rev Med* 57 (2006): 419-436.
8. Johanna A. Kremer Hovinga, Paul Coppo, Bernhard Lämmle and Joel L. Moake, et al. "Thrombotic Thrombocytopenic Purpura." *Nat Rev Dis Primers* 3 (2017): 1-17.
9. Nil Albiol, Rahinatu Awol and Rodrigo Martino. "Autoimmune Thrombotic Thrombocytopenic Purpura (TTP) Associated with COVID-19." *Ann Hematol* 28 (2020): 1-2.
10. Fehmi Hindilerden, Ipek Yonal-Hindilerden, Emre Akar and Kadriye Kart-Yasar. "COVID-19 Associated Autoimmune Thrombotic Thrombocytopenic Purpura: Report of a Case." *Thromb Res* 195 (2020): 136-138.

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