

Thrombotic Microangiopathy after COVID 19 Infection in Pregnancy.

Lakshmi Aishwarya P, Ram, V.Shiv Kumar, Murali.M, Prasanna.N, Mathini, Alekhya, Maria

Department of Nephrology

Sri Venkateswara Institute Of Medical sciences

INTRODUCTION

- COVID-19 caused by Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is not restricted to the respiratory system, but it may trigger an excessive immune response, leading to multiple organ failure and death..
- We report a patient of thrombotic microangiopathy(TMA) after COVID-19 infection in pregnancy.

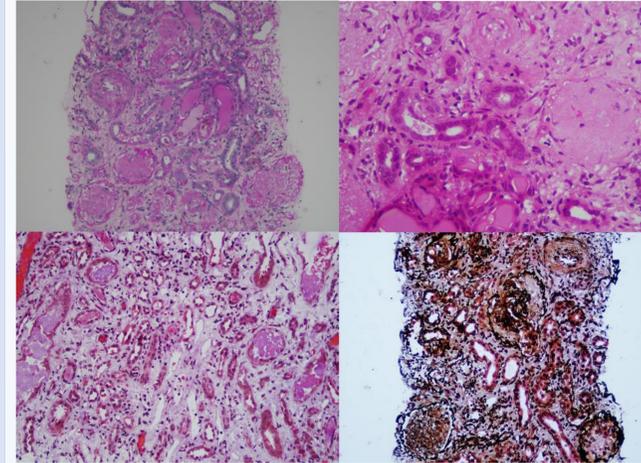
CASE REPORT

- We present a case of 26 -year- old female primigravida with no comorbidities.
- Had regular antenatal visits .There was no history of gestational hypertension, pedal oedema, blurred vision.
- Patient was tested to be positive for COVID-19 infection by Reverse transcription-polymerase chain reaction(RT-PCR) at 28 weeks period of gestation.
- Patient underwent testing as she was a primary contact of a COVID-19 infected patient. Patient was advised home isolation as she was asymptomatic and was started on Tab.Asprin 75mg per day by an obstetrician.
- Patient presented at 31 weeks period of gestation with severe abdominal pain, bleeding per vaginam and pedal oedema.
- Patient underwent emergency lower segment caesarian section due to placental abruption and four units of packed red blood cell transfusion was given in view of blood loss.
- Patient was oliguric post surgery and was initiated on hemodialysis.
- Required three antihypertensives for control of blood pressure.
- Investigations as shown below were suggestive of thrombotic microangiopathy with thrombocytopenia, hemolytic anemia and renal failure.
- Testing for complement system regulators and genetic screening for panel of genes involved in TMA could not be done in this patient.

Investigations

Parameter	Result
Hemoglobin (g/dL)	5
Total leucocyte count (cells/cu mm)	17100
Platelet count (lakhs/cu mm)	76000
Peripheral smear	schistocytes
S. Urea (mg/dL)	90
S. Creatinine (mg/dL)	3.5
Total bilirubin (mg/dL)	1.8
SGOT (IU/L)	55
SGPT (IU/L)	43
Alkaline phosphatase (IU/L)	131
Total protein (g/dL)	5.6
Albumin (g/dL)	2.2
Sodium (mmol/L)	138
Potassium (mmol/L)	4.5
PT (test/control in seconds)	17/13.5
APTT (test/control in seconds)	33.8/32.5
INR	1.3
LDH(IU/L)	826
D-Dimer (normal reference range 0.1-0.5 mcg/mL)	0.1
Haptoglobin(normal reference range 30-200 mg/dL)	<10
Urine protein	2+
Urine RBC	10-12
Direct coombs test	negative
ADAMTS 13 activity%(60.6-130.6)	83
Anti nuclear antibody	negative
Anti ds DNA antibody	negative
ANCA	Negative
Anti phospholipid antibodies	negative
C3 complement(normal reference range 90-150 mg/dL)	86
C4 complement(normal reference range 10-40 mg/dL)	18

Renal biopsy



Renal biopsy was suggestive of Thrombotic microangiopathy with features of chronicity.

light microscopy

- Eleven glomeruli were present. Two were globally sclerotic. There was acellular closure of the capillary tuft in eight glomeruli. The mesangium in these glomeruli had a fibrillary appearance. No fibrin thrombi were identified within the capillaries. The single viable glomerulus in this biopsy showed mild mesangial hypercellularity. Capillary lumen was open. No spike formation or double contours were seen on the glomerular basement membrane.
- Interstitial fibrosis and tubular atrophy involved about 15-20% of the core. There was extensive tubular epithelial cell injury. Cell debris are seen in many of the medullary tubules. Interstitium was edematous and showed inflammatory infiltrate in the medullary region.
- Subendothelial swelling was noted in the arterioles and small arteries.

Immunofluorescence

- 9 glomeruli were present for evaluation. The section was stained for IgG, IgM,IgA,C3,C1q,Kappa& Lambda light chains. All stains were negative.

Specific treatment and outcome

- Patient underwent daily therapeutic plasma exchange for 5 sessions and alternate day for another 5 sessions .
- Patient renal function did not improve, continued to be oliguric and required continuation of hemodialysis.

DISCUSSION

- Thrombotic microangiopathy(TMA) is characterized by thrombocytopenia, microangiopathic hemolytic anemia, and organ injury.
- The important causes of TMA in pregnancy are preeclampsia, HELLP syndrome, thrombotic thrombocytopenic purpura, hemolytic uremic syndrome and catastrophic anti phospholipid syndrome.
- TMA has been associated with a wide range of infections mainly bacterial but also associated with viral, parasitic and fungal infections.
- Few case reports of TMA in patients with COVID -19 were reported.
- Only 2 case reports of TMA due to COVID-19 in pregnancy were reported.

CASE REPORTS OF TMA DUE TO COVID-19 IN PREGNENCY	AGE	ADAMTS 13 ACTIVITY	ADAMTS 13 INHIBITOR	TESTING FOR PRIMARY COMPLEMENT DISORDER	PAST HISTORY OF TMA	PLEX THERAPY	OTHER TMA SPECIFIC THERAPIES	OUTCOME
Aminimoghaddam et al[1]	21	Not done	Not done	Not done	No	Yes	-	Recovered
Hamed Azhdari Tehrani et al[2]	25	<10%	present	Not done	no	yes	steroids	Recovered
Present case	26	normal	Not done	Not done	no	yes	-	No renal recovery

CONCLUSIONS

- In predisposed patients for TMA both the virus and the pregnancy could operate in tandem or individually as second hits by triggering a flare or by unmasking a latent disease.
- In our patient COVID -19 infection in pregnancy may have triggered the development of thrombotic microangiopathy.
- SARS-CoV-2 being a novel virus, the definite effect of this virus during pregnancy is not fully known.

REFERENCES

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- Tehrani, H., Darnahal, M., Haghighi, S., 2020. Covid-19 in a pregnant female with thrombotic microangiopathy a case report. Clin. Case Rep. 10, 1392.