CASE REPORT

Massive post-partum haemorrhage in a SARS-CoV-2 positive primi gravid patient: A case report

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Abstract

A 20-year-old, primi gravid, south Asian woman, was referred from secondary care to Aga Khan University Hospital for further management of primary post-partum haemorrhage after a normal vaginal delivery, on July 12, 2021. She was otherwise healthy, with no known comorbidity. She tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) during her admission, on account of universal COVID-19 testing policy. Initially, conservative measures were instituted to control bleeding, including bilateral internal iliac artery ligation, concluding with hysterectomy to stop the haemorrhage. Multiple units of blood products had to be transfused. Obstetrical haemorrhage being the menace in this case, the possibility of COVID-19 positive obstetrics patients being more susceptible to massive post-partum haemorrhage, requiring more radical life-saving procedures to be conducted earlier, was considered. In future, more observational studies will be needed to determine any association between COVID-19 infection and obstetric haemorrhage.

Keywords: Pregnancy, COVID-19, haemorrhage.

DOI: https://doi.org/10.47391/JPMA.6496

Submission completion date: 21-03-2022
Acceptance date: 02-02-2023

Introduction

COVID-19, caused by SARS-Cov-2, emerged as a virulent global pandemic, resulting in considerable morbidity and mortality, irrespective of demographics. Pregnant females are especially susceptible for acquiring the infection,[1] because of the physiological alterations in pregnancy, and reduced immunity. Worldwide population studies to date have identified several patient characteristics, including age and comorbid conditions, as risk factors for poor outcomes, but the available data on pregnancy outcome in relation to SARS-CoV-2 infection is heterogeneous, and there is a paucity of it.[2-4]

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Emerging data on the maternal impact of COVID-19 still suggests that the clinical course is similar, irrespective of pregnancy.[4] However, studies have identified increased thromboembolic risk and disseminated intravascular coagulation (DIC), due to hypercoagulability in COVID-19 sufferers, which could present as either thrombosis or haemorrhage. This is augmented by pregnancy itself, more so in the postpartum period.[5,6]

Obstetrical haemorrhage is already one of the leading causes of maternal morbidity and mortality. It could pose an even greater risk in SARS-CoV-2 affected mothers. Several studies suggest similar quantitative blood loss during delivery in both COVID-19 affected and unaffected individuals.[7] However, the gravity of obstetric haemorrhage should prompt obstetricians to continue to practice with clinical vigilance in providing care for the COVID-19 infected parturient. We present here a case of a primigravida who was COVID-positive and developed severe post-partum haemorrhage after a normal vaginal delivery which could not be controlled by the recommended measures.

Case Report

A 20-year-old, primi gravid, south Asian female with no known comorbidity, booked at a secondary care hospital, where she presented in early labour at 08.00 hours on July 11, 2020, and delivered a healthy baby via spontaneous vaginal delivery with episiotomy at 20.00 hours. Post-delivery, she developed torrential post-partum haemorrhage (PPH).and had to be examined under anaesthesia and eventually was referred to a tertiary care hospital for management.

On arrival at the Aga Khan University Hospital, Karachi, on July 12, 2020, at 01.30 hours, she was drowsy, confused and pale, blood pressure was 78/48 mm Hg, pulse of 120beats /minute, and respiratory rate of 36/minute, maintaining oxygen saturation at 98% on room air.

The abdomen palpated was soft and non-tender, with a well-contracted uterus. Speculum examination revealed that the vagina was full of blood clots, and fresh blood was pouring out. Hence, the patient was shifted to the operating room (OR) for examination under anaesthesia. Relevant investigations were sent from the emergency

room (results are depicted in Table 1), including universal COVID-19 testing, which returned positive. Hence, all further management was conducted with full COVID-19 PPE (personal protective equipment) protocols.

Examination under anaesthesia revealed the uterus to be boggy, with a relaxed lower uterine segment. A draining episiotomy was also noted, which was secured in layers, and a cervical tear at 3 o'clock position was repaired. Uterine balloon tamponade was inserted and the vagina tightly packed with two 3-inch ribbon gauzes. A total of four units of packed cells volumes, four of fresh frozen plasma, and four of platelets were transfused intra-operatively, with an estimated blood loss of 700 to 800ml.

The patient was returned to the OR upon bleeding again, where the uterus was noted to be atonic, and exploratory laparotomy was planned at 07.30 hours. Abdomen was opened via Pfannestiel incision and uterine atony discovered. Modified B-lynch sutures application was followed by bilateral internal iliac arteries ligation. No retained products of conception were discovered upon uterine curettage. The vagina was tightly packed with two 3-inch ribbon gauzes. Estimated blood loss of further 4,000 to 5,000ml was encountered by two units of packed cell volumes, four of platelets, four of fresh frozen plasma and six of cryoprecipitate transfusion. Medical management in terms of Oxytocin infusion and Misoprostol was continued as per protocol throughout.

Table-1: Investigations on arrival to AKUH.

Investigations	Results	Normal ranges
Haemoglobin/ Haematocrit	6.8 g/dl /21.6 %	11-14.5/ 34.5-45.4%
Total leucocyte count	26.7 x 10^9 / L	4.6-10.8 x 10^9/L
Neutrophils	78 %	34.9-76.2%
Platelets	46 x 10^9/ L	154-433 x 10^9/ L
Blood urea nitrogen	6 mg/dl	6-20 mg/dl
Creatinine	1.0 mg/dl	0.6-1.1 mg/dl
Sodium	137 mmol/L	136-145 mmol/L
Potassium	4.4 mmol/L	3.5-5.1 mmol/L
Magnesium	1.6 mg/dl	1.6-2.6 mg/dl
Bicarbonate	15.1 mmol/L	20-31 mmol/L
TOTAL BILIRUBIN	0.6 mg/dl	0.1-1.2 mg/dl
DIRECT/INDIRECT BILIRUBIN	0.4/0.2 mg/dl	0.0-0.2/0.1-0.8 mg/dl
Serum glutamic-pyruvic transaminase	193 IU/L	< 35 IU/ L
Prothrombin time/ International normalized ratio	16.6 seconds/ 1.6 ratio	9.3-12.8 seconds/ 0.9-1.2 ratio
Activated partial thromboplastin time	43.4 seconds	22.9-34.5 seconds
CORONA nasopharyngeal swab	POSITIVE	

Table-2: Chronology of blood products transfused.

	Estimated blood loss	Packed cell volume transfused	Fresh frozen plasma transfused	Platelets transfused	Cryoprecipitate transfused
First surgical procedure	700-800 ml	4	4	4	0
Second surgical procedure	4000-5000ml	2	4	4	6
Covid 1CU stay		7	10	10	0
Third surgical procedure	5000-6000ml	5	6	12	4
Covid ICU stay		4	13	12	7
Total		22	37	42	17

The patient was shifted to the COVID–ICU and kept intubated. At 10.30 hours, a call was received from the ICU regarding further haemorrhage. Upon examination, tachycardia and tachypnoea was present, with a pulse of 150 to 160 beats /minute and a respiratory rate of 24 breaths/minute. Significant amount of blood was present on the bed sheet; however, no active bleeding was noticed, so observation was planned and further blood products were transfused.

At 12.30 hours another episode of heavy bleeding was reported, but as the bleeding settled without any further intervention, it was decided to continue observation with Oxytocin infusion and transfusion of blood products.

At 20.00 hours, a further episode was reported, and the patient was found to be pale, hypotensive, with a blood pressure of 80/40 mm of mercury, and a pulse 130-150 beats/minute. The uterus was relaxed with profuse vaginal bleeding despite the packing. Norepinephrine support had commenced, and the patient was shifted back to OR for re-exploration. On July 12, 2020, at 21.30 hours, exploration revealed a vagina full of blood clots and an atonic uterus. The abdomen was opened through the previous incision and total abdominal hysterectomy with bilateral salpingectomy was eventually performed. Haemostasis was secured, and the abdomen was packed with 12 sterile abdominal packs, with a peritoneal drain kept in place. Rectus sheath was left un-sutured with only skin closure done. Estimated blood loss of 5,000 to 6,000ml was encountered. Table 2 depicts the total blood products transfused, and their chronology.

The patient was shifted back to COVID-ICU, where investigations were repeated, and blood products replaced accordingly. Laparotomy for removal of abdominal packs and closure of abdominal wound was done on July 15, 2020, and the patient was shifted toward facility on July 16, 2020.

Peritoneal drain was removed on July 17, 2020. The patient demonstrated a stable course there after, with investigations too showing improvement as depicted in Table 3, and was discharged on July 19, 2020. She was followed-up in the clinic after one week for stitch removal, and returned after further two weeks for discussion of further care. After a

Table-3: Postoperative investigations.

Investigations	Results	Normal ranges
Haemoglobin/ Haematocrit	10.8 g/dl /32.4 %	11-14.5/ 34.5-45.4%
Total leucocyte count	18.2 x 10^9 / L	4.6-10.8 x 10^9/L
Neutrophils	71.8 %	34.9-76.2%
Platelets	167 x 10^9/ L	154-433 x 10^9/ L
Blood urea nitrogen	8 mg/dl	6-20 mg/dl
Creatinine	0.4 mg/dl	0.6-1.1 mg/dl
Sodium	140 mmol/L	136-145 mmol/L
Potassium	3.8 mmol/L	3.5-5.1 mmol/L
Magnesium	104 mg/dl	1.6-2.6 mg/dl
Bicarbonate	25.4 mmol/L	20-31 mmol/L
TOTAL BILIRUBIN	0.4 mg/dl	0.1-1.2 mg/dl
DIRECT/INDIRECT BILIRUBIN	0.1/0.3 mg/dl	0.0-0.2/ 0.1-0.8 mg/dl
Serum glutamic-pyruvic transaminase	113 IU/L	< 35 IU/ L
Prothrombin time/ International normalized ratio	11.0 seconds/1.0 ratio	9.3-12.8 seconds/ 0.9-1.2 ratio
Activated partial thromboplastin time	24.8seconds	22.9-34.5 seconds
D-dimer	5.4	< 0.50

total of four visits, she was noted to be recovering well from the trauma she had undergone.

Discussion

Pregnant women are more susceptible to viral respiratory infections because of immunological and physiological adaptations of pregnancy. Data from previous pandemics and seasonal influenza suggest the same.[8] Numerous studies have been carried out regarding the effect of pregnancy on COVID-19, suggesting that the physiological changes in normal pregnancy and the metabolic and vascular changes in high-risk pregnancies may exacerbate the clinical presentation of COVID-19. Major risk factors for associated morbidity were black and Hispanic race, advanced maternal age, medical comorbidities, and antepartum admissions related to COVID-19. This would mean greater ICU admission and need for mechanical ventilation, owing to a more severe or critical disease process.[8]

COVID-19 with pregnancy increases the risk of pre-eclampsia and pre-term delivery, and a greater chance of thrombocytopenia, with reported platelets of <150,000/mm. COVID-19 has a major impact on the haematological findings of those affected. It increases the risk of coagulopathy, with elevated D-dimer, prothrombin time (PT), activated partial thromboplastin time (APTT), FDP, and fibrinogen levels, which has made the possibility of venous thromboembolism, and its prevention in such patients, a priority. Patients with severe disease showed higher values of D-dimer and FDP than those with milder manifestation. Hence, disseminated intravascular coagulation (DIC) may be common in patients with severe form of COVID-19 infection. Manifestations of this can be either thrombotic or haemorrhagic. This does lead to the possibility of higher risk of obstetrical haemorrhage in pregnant, COVID-19 positive population. [8-10]

Majorly, it is recognised that COVID-19 positive patients do not have a significantly higher quantitative blood loss than the negative ones. Earlier studies from China also observed no difference in the incidence of postpartum haemorrhage in vaginal deliveries and caesarean sections associated with COVID-19 positive compared with COVID-19 negative patients.[4,6,7]

There is some evidence pointing to the contrary, but they are mostly case series. One case series included the case of a low risk, second gravid COVID-19 positive patient, who sustained a postpartum haemorrhage (PPH) of 1.5 L, which was controlled with uterine artery ligation and B-Lynch compression, alongside utero-tonics and blood products. The series proposed fibrinogen as the only coagulation parameter associated with PPH severity; with a positive predictive value of 100% with fibrinogen < 2 g/L. This was the first of such reports describing COVID-19-related acutely progressive coagulopathy in the third trimester of pregnancy, the recovery of which appears to be hastened by delivery.[5] Thus, there is evidence indicating a possible link between third-trimester maternal COVID-19 infection and rapid maternal deterioration, with progressive coagulopathy, improving shortly after delivery, but there is a dearth of it. Obstetricians should continue to practice with clinical vigilance in providing care for the COVID-19 infected parturient.

This case report demonstrates the hospital course of a COVID-19 positive, primi gravid, with no identifiable risk factors, suffering a massive postpartum haemorrhage. Haematological changes indicated disseminated intravascular coagulation. After multiple blood transfusions and surgical measures to control the bleeding, hysterectomy was the final resort to govern the unending haemorrhage. Hence, it could be a life-saving measure to anticipate an increased risk of obstetric haemorrhage in COVID-19 positive parturients, and make all the necessary arrangements, including interventional radiology and radical surgical procedures, with rapid availability of blood products, to battle this situation. Further observational studies are needed to assess the association of such complications with COVID-19 infection.

Conclusion

COVID-19 positive obstetrics patients might be at a higher risk of massive obstetrics haemorrhage, which would require the health care professionals to be ready to perform radical interventions to save lives. High quality observational studies are required to establish an

association between COVID-19 infection and obstetric haemorrhage, to identify women who require vigilant monitoring and earlier intervention.

Patient's Consent: Patient's written consent was taken to publish this case report.

Disclaimer: None.

Conflict of interest: None.

Funding disclosure: None.

References

1. Narang K , Enninga EAL , Gunaratne MDSK , Ibirogba ER , Trad ATA , Elrefaei A. SARS-CoV-2 Infection and Covid-19 During Pregnancy: A Multidisciplinary Review. Mayo Clin Pro. 2020; 10.1016/j.mayocp.2020.05.01.
2. Pirjani R, Hosseini R, Soori T, Rabiei M, Hosseini L, Abiri A, et al. Maternal and neonatal outcomes in Covid-19 infected pregnancies: a prospective cohort study. J Travel Med. 2020; 27:taaa158. doi: 10.1093/jtm/taaa158.
3. Chen Y, Li Z, Zhang YY, Zhao WH, Yu ZY. Maternal health care management during the outbreak of coronavirus disease. J Med Virol. 2019. 2020; 92:731-9. doi: 10.1002/jmv.25787.
4. Liao J, He X, Gong Q, Yang L, Zhou C, Li J, et al. Analysis of vaginal delivery outcomes among pregnant women in Wuhan, China during the Covid-19 pandemic. Int J Gynaecol Obstet. 2020; 150:53-7. doi: 10.1002/ijgo.13188.
5. Koumoutsea VE, Vivanti AJ, Shehata N, Benachi A, Le Gouez A, Desconclois C, et al. Covid-19 and acute coagulopathy in pregnancy. J Thromb Haemost. 2020; 18:1648-52. doi: 10.1111/jth.14856.
6. Schulman S, Hu Y, Konstantinides SJT, haemostasis. Venous Thromboembolism in Covid-19. Thromb Haemost. 2020; 120:1642-53. doi:10.1055/s-0040-1718532.
7. Wang MJ, Schapero M, Iverson R, Yarrington CD. Obstetric Haemorrhage Risk Associated with Novel Covid-19 Diagnosis from a Single-Institution Cohort in the United States. Am J Perinatol. 2020; 37:1411-6. doi: 10.1055/s-0040-1718403.
8. Brandt JS, Hill J, Reddy A, Schuster M, Patrick HS, Rosen T, et al. Epidemiology of coronavirus disease 2019 in pregnancy: risk factors and associations with adverse maternal and neonatal outcomes. 2021; 224:389.e1-389.e9. doi: 10.1016/j.ajog.2020.09.043.
9. Makatsariy A, Slukhanchuk E, Bitsadze V, Khizroeva J, Tsibizova V, et al. COVID-19, neutrophil extracellular traps and vascular complications in obstetric practice. J Perinat Med. 2020;48:985-94.doi: 10.1515/jpm-2020-0280.
10. Terpos E, Ntanasis-Stathopoulos I, Elalamy I, Kastritis E, Sergentanis TN, Politou M, et al. Haematological findings and complications of Covid-19. Am J Hematol. 2020; 95:834-47. doi: 10.1002/ajh.25829