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# Midtrimester pregnancy loss in IVF conception due to parvovirus -A twisted tale of gravid

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## ABSTRACT

Mid trimester pregnancy loss due to parvovirus infection in patients with IVF conception is an infrequent finding encountered in pregnancy and is associated with high output cardiac failure, anemia, and hydrops fetalis. Effects may range from an uncomplicated pregnancy to severe hydrops fetalis or intrauterine fetal death. Parvovirus B19 causes prolonged epidemics of erythema infectious, particularly in primary school-aged children. Infection produces clinically significant anemia in those who have a high red cell turnover rate, such as the fetus. Infection affects around 40% of women of reproductive age, with annual seroconversion rates ranging from 1.5 percent during endemic periods to 10-15 percent during epidemics. Around 50% of susceptible women infected at home are infected, and 20-30% gets infected after professional exposure, such as in a primary school. Maternal infection during the first half of pregnancy is linked to 10% more fetal loss and 3% more occurrences of hydrops fetalis. Congenital abnormalities or long-term sequelae have been attributed to parvovirus B19 infection. We are presenting a case of 34 years old teacher conceived through IVF with five months of amenorrhea with leaking per vaginum and spotting. She was diagnosed with severe oligohydramnios and IgG positive status which previous history of parvovirus infection and had twin fetal demise both of which presented with hydrops fetalis.

**Keywords:** Parvovirus B19, fetal, infection, hydrops, anemia

## 1. INTRODUCTION

Erythema infectiosum, popularly known as the fifth disease, is caused by parvovirus B19, a single-stranded DNA virus. The infection is contagious and is spread mostly through respiratory secretions. Fetal erythroid progenitor cells infection can lead to fetalanemia and heart failure, which can cause hydrops fetalis or fetal death if a mother becomes Immunity to parvovirus B19developed in half to seventy percent of women who can reproduce infected while pregnant (Anand, 1987). Without prior exposure, between 1%

and 3% of susceptible pregnant women develop serologic evidence of infection during pregnancy with rates exceeding 10% during epidemics (Broliden and Tolfvenstam, 2006). Where there is a high chance of being infected to parvovirus B19, such as in a daycare center or school, one out of every ten children is expected to contract the virus; 20 percent to 30 percent of vulnerable women 50 percent of susceptible women exposed through household contacts are expected to contract the virus. Compared to other pregnant women, nursery school instructors had a threefold increased risk of acute infection, whereas other school teachers have a 1.6-fold increased risk.

## 2. CASE HISTORY

We discuss the case of a 34-year-old teacher who was conceived through IVF and had 20 weeks of amenorrhea, as well as burning micturitionsince three days and leaking per vaginum since four days. She also complains of vaginal spotting. She had a history of childhood parvovirus B19 infection, which gave her the slapped check appearance. She had type 2 diabetes and hypothyroidism, for which she was taking medications. Her vitals were normal on admission, but she had pallor and oedema. On inspection of the abdomen, the uterus was 24 weeks size, the uterus was relaxed, multiple fetal parts were felt, and the fetal heart sound was present, regular at 142 and 150 beats per minute. Her blood tests revealed anemia and leukocytosis, as well as a rise in C reactive proteinand her parvovirus B19 infection was confirmed. A radiological scan revealed diamniotic dichorionic twins with severe oligohydramnios and absolute zero liquor at 20 weeks of pregnancy. Patient was managed conservatively with adequate hydration, antibiotics, and blood transfusions, as well as complete bed rest and proper monitoring of fetal heart sounds with weekly ultrasonography and blood investigations done. Weekly scans were performed, which were suggestive of fetal demise, due to a cervical length of 4 cm and os that was tightly closed with no further dilatation on induction. Patient was taken for hysterotomy; the fetus was born with hydrops fetalis (figure 1 and 2) and blood was transfused intraoperatively. Blood tests came back normal after surgery, and the patient was discharged on day 7as shown in table 1.

**Table 1** Showing Blood Investigations of the case

| S NO | INVESTIGATION | MEASURED VALUE (21/04/2022) | MEASURED VALUE (9/05/2022) | MEASURED VALUE (15/05/22) |
|---|---|---|---|---|
| 1 | CBC | HB 6 gm%<br>TLC 25000/cumm<br>PLT 2 lacs/cumm | HB 8 gm%<br>TLC 15000/cumm<br>PLT-2.01 lacs/cumm | HB 10.4 gm%<br>TLC 9200/cumm<br>PLT-1.5 lacs/cumm |
| 2 | LFT | ALKALINE PHOSPHATASE 188<br>SGOT 30<br>SGPT 42<br>TOTAL PROTEIN 4.9<br>ALBUMIN 3.2<br>GLOBULIN 2.6<br>TOTAL BILIRUBIN-0.5 | ALKALINE PHOSPHATASE 280<br>SGOT 100<br>SGPT 88<br>TOTAL PROTEIN 4.8<br>ALBUMIN 3<br>GLOBULIN 2.6<br>TOTAL BILIRUBIN-0.6 | ALKALINE PHOSPHATASE 198<br>SGOT 58<br>SGPT 35<br>TOTAL PROTEIN 4.7<br>ALBUMIN 3.4<br>GLOBULIN 2.5<br>TOTAL BILIRUBIN-0.5 |
| 3 | KFT | UREA 15<br>CREATNINE 0.7<br>SODIUM 137<br>POTASSIUM 4.6 | UREA 17<br>CREATNINE 0.8<br>SODIUM 140<br>POTASSIUM 4.5 | UREA 20<br>CREATNINE 0.7<br>SODIUM 138<br>POTASSIUM 4.4 |
| 4 | LDH | 400 | 259 | 214 |
| 5 | CULTURE-HVS | NO GROWTH<br>GROWTH OF ENTEROCOCCI | NO GROWTH<br>GROWTH OF ENTEROCOCCI | NO GROWTH<br>NO GROWTH |
| 6 | CRP | 44 | 17 | 2 |

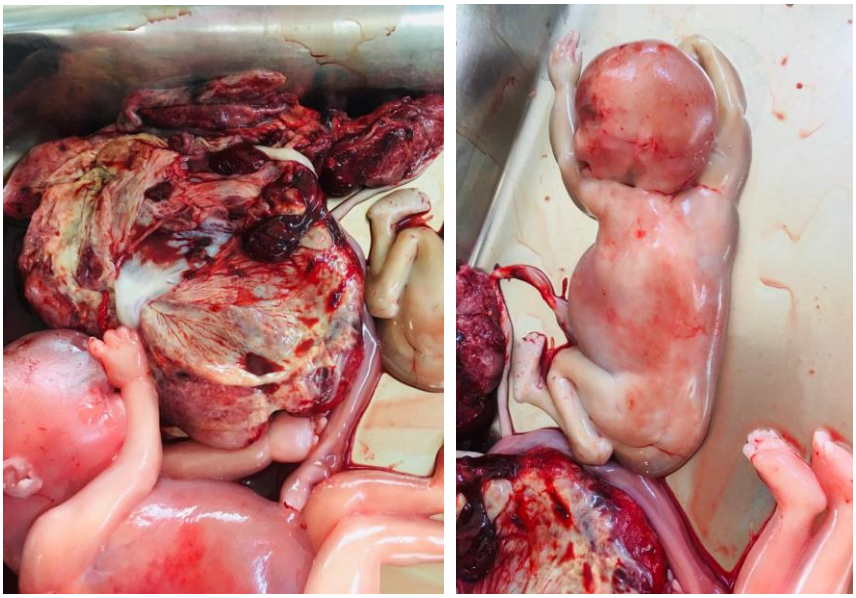

**Figure 1** hydrops foetalis due to parvovirus b 19 infection

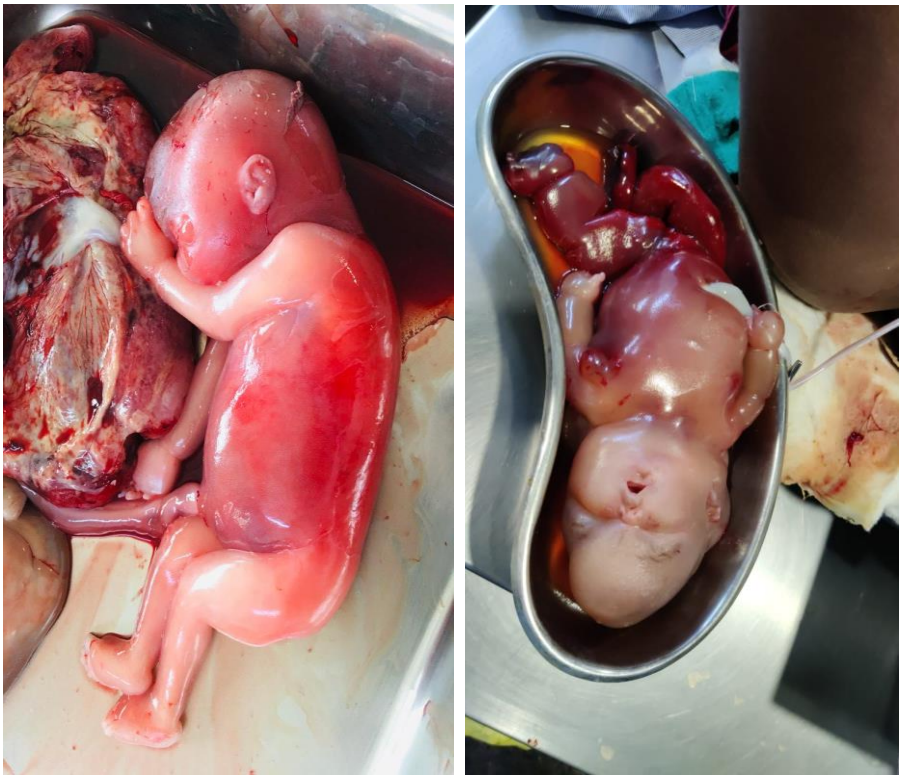

**Figure 2** spontaneous abortion in mid trimester due to parvovirus b19 infection

## 3. DISCUSSION

Parvovirus B19 infection is connected to a variety of clinical symptoms and outcomes. A simple pregnancy to severe hydrops fetalis or fetal death in the womb could be the result. The symptoms of a pregnant woman are distinct and can cause a delay in diagnosis. B19 (B19V) is a small virus that can infect people and cause a variety of ailments, the "fifth disease" of infancy (Young and Brown, 2011). According to serological investigations, antibodies to B19V are detected in almost half of all young men and women (Cohen, 1988). The rest 50% of women are at higher of being infected during pregnancy leading to non-immune hydrops fetalis, a known cause of fetal death. In the middle of the trimester, the chance of vertical transmission increases. Fetuses infected with parvovirus B19 had a 14.8 percent higher risk of spontaneous abortion before 20 weeks of pregnancy and a 2.3 percent higher risk after 20 weeks. Due to fetalanemia (caused by the virus passing via the placenta) and a shorter half-life of fetal red blood cells, severe

anemia, hypoxia, and heart failure become more common. Other causes include fetal viral myocarditis, which can lead to heart failure, and liver dysfunction caused by hemosiderin deposits that cause direct and indirect harm to hepatocytes.

If the infection occurs 19-20 weeks before conception (14.8 percent), the fetal loss rate is higher than if it occurs at 20 weeks (2.3 percent in a fetus with hydrops, ultrasonography can reveal ascites, cutaneous edema, pleural and pericardial effusions, and placental edema. The peak systolic velocity of the middle cerebral artery is an essential biomarker of fetalanemia in high-risk pregnancies and in the presence of some fetal disease. The initial step in treating Parvovirus B19 is to test for IgG and IgM antibodies that are unique to Parvovirus B19 (Valeur Jensen and Anne Kristine, 1999). If a pregnant woman is exposed to parvovirus B19 or develops symptoms, she should have IgG and IgM tests done to see if she is immune. Parvovirus B19 IgM antibodies arise two to three days after acute infection and can last for up to six months. IgG is a parvovirus B19 antibody that emerges a few days after IgM and lasts a lifetime.

Our patient had a history of parvovirus B19 infection as a child and vaginal leaks, with ultrasound confirming twin fetuses with little fluid. Her IgG test is positive, but her IgM test is negative, indicating that she has had a past parvovirus infection. We must stress the need of early detection and treatment, especially in rural regions where there is a lack of awareness.

## 4. CONCLUSION

Most pregnant women who had B19 infections are at a high risk of fetal loss and non-immune hydrops fetalis, or mid-pregnancy fetalanemia. A tertiary care institution where patients are treated in a timely way should be used to diagnose fetalanemia caused by parvovirus infection as soon as feasible to avoid subsequent maternal issues such as fetal loss and health problems. Patients with the condition should be identified and treated early.

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**Informed Consent**

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**Conflicts of interest**

The authors declare that there are no conflicts of interests.

**Data and materials availability**

All data associated with this study are present in the paper.

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