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A TINY VIRUS, A HUGE IMPACT: PARVOVIRUS B19 AND NON-IMMUNE FETAL HYDROPS (CASE REPORT)

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ABSTRACT A 31-year-old gravida - 2 parity - 1 woman presented at 20 weeks of gestation with a diagnosis of non-immune hydrops fetalis (NIHF) attributed to parvovirus B19 infection. Previous prenatal assessments were unremarkable, with no maternal or fetal issues identified. Her first child had a recent history of fever and rash, suggestive of fifth disease. Detailed ultrasound at our hospital confirmed severe fetal hydrops with ultrasound showing ascites, skin edema and pericardial and pleural effusions. Serological testing revealed IgM: positive and IgG: Negative titers for parvovirus B19, indicating recent primary infection. Due to spontaneous preterm labor, she delivered a stillborn female infant without gross anomalies. This case underscores the importance of early recognition, thorough evaluation, and comprehensive management of parvovirus B19-related NIHF to optimize pregnancy outcomes.

KEYWORDS : Non Immune Hydrops Fetalis, NIHF, Parvovirus B19, still birth

INTRODUCTION

Non-immune hydrops fetalis (NIHF) is a rare but serious fetal condition. It is characterized by abnormal accumulation of fluid in two or more fetal compartments, including the subcutaneous tissue, pleural cavity, pericardium, and peritoneal cavity, without evidence of immune-mediated causes such as Rh incompatibility. This condition arises from various underlying fetal or placental abnormalities that disrupt the normal fluid balance.

Epidemiologically, NIHF occurs in approximately 1 in 1,700 to 3,000 pregnancies, making it a relatively uncommon condition but one that requires prompt recognition and management due to its potential impact on fetal and neonatal outcomes. (1) The etiology of NIHF is heterogeneous and can include structural anomalies (e.g., congenital heart defects, chromosomal abnormalities such as Turner syndrome), genetic disorders (e.g., metabolic diseases, skeletal dysplasias), infections (e.g., parvovirus B19, cytomegalovirus), and placental abnormalities (e.g., twin-to-twin transfusion syndrome).

Through this case report we study a case of Non Immune Hydrops Fetalis caused due to infection with Parvovirus B19.

CASE REPORT

Image 1 – Still born baby with Hyprops

Our patient, a 31 years old woman, gravida - 2 parity - 1, referred to our hospital at 29 weeks of gestation in view of Non Immune Hydrops Fetalis (NIHF). Her 1st and 2nd trimester prenatal laboratory tests and all previous antenatal ultrasonography scans, including a detailed anomaly ultrasound at 19 weeks showed normal results, indicating no maternal or fetal issues were identified. She also had no medical, surgical, or social history that could impact her current pregnancy. She gave history of her first child having fever with rashes on cheeks and mild upper respiratory tract infection one month ago, which has resolved spontaneously. Severe fetal hydrops was confirmed during a detailed ultrasound at our hospital, characterized by ascites, skin edema and pericardial and pleural effusions. Her blood group was B Rhesus positive and no maternal anemia was seen. Serologic tests were conducted to screen for congenital infections, including Cytomegalovirus (CMV), Syphilis, Parvovirus B19 and Toxoplasmosis, which were all negative except for Parvovirus B19. The IgG titer was negative, indicating non-immunity, while the IgM titer was positive, suggesting a recent primary infection. This confirmed the diagnosis of non-immune fetal hydrops. The patient went into spontaneous pre term labour. She delivered a still born female baby with no visible gross anomalies. (Image 1) Post natal period was uneventful.

DISCUSSION

Parvovirus B19 is a common viral infection that affects humans, primarily known for causing fifth disease in children. It is also called erythema. Parvovirus B19 is a small, non-enveloped, single-stranded DNA virus belonging to the Parvoviridae family. (2) It spreads through respiratory droplets from infected individuals, making it highly contagious. Additionally, transmission can occur through blood products, posing a risk during blood transfusions, and vertically from mother to fetus, which is of particular concern in pregnancy. Maternal infections are commonly transmitted via respiratory droplets and hand-to-mouth contact (3).

In non-pregnant individuals, parvovirus B19 infection often presents with mild symptoms such as fever, headache, and a characteristic "slapped cheek" rash. However, the clinical presentation can vary widely, and some infected individuals, including pregnant women, may be asymptomatic. Diagnosis during pregnancy is done by serological testing to detect antibodies. IgM indicates acute infection and IgG indicates past infection or immunity. A negative IgG test is suggestive of susceptibility to primary infection, which poses a higher risk to the fetus. It is summarized in the Table 1.

When a pregnant woman contacts parvovirus B19, the virus can cross the placenta and infect the fetus. This is significant because the rapidly dividing cells such as the erythroid progenitor cells of the bone marrow of the fetus are targeted by the virus. This can lead to severe complications such as fetal anemia, which may progress to hydrops fetalis which is a condition characterized by abnormal accumulation of fluid in two or more fetal compartments (e.g., skin, pleural cavity, pericardial cavity, abdominal cavity).

Maternal viremia peaks approximately 1 week from the point of infection, with IgM Ab detectable in maternal blood between 1 to 2 weeks and IgG Ab between 2 – 3 weeks. (4) Approximately 25% of infections are asymptomatic, while some individuals may experience flu-like symptoms. Transplacental transmission occurs in upto fifteen percent of cases before 15 weeks of gestation, increasing to twenty five percent between 15-20 weeks of gestation and can rise up to seventy percentage toward term. The highest risk of fetal hydrops is observed in the first half of pregnancy (i.e., 3% before 20 weeks versus 1% after 20 weeks). (5)

Table 1: Parvovirus B19 Infection In Pregnancy – Evaluation And

Management (6)

Ig G	Ig M	Interpretation	Management
Positive	Negative	Past infection, Immune	Reassurance
Negative	Negative	No past infection Patient is not immune	After 2 to 4 weeks tests are to be repeated
Positive	Positive	Suggestive of a recent infection	Requires further evaluation for fetal well being
Negative	Positive	Suggestive of a recent infection	Requires further evaluation for fetal well being

The multidisciplinary approach to managing pregnancy-associated parvovirus B19 infection involves obstetricians, maternal-fetal medicine specialists and infectious disease experts. A positive IgM indicates recent infection, prompting fetal surveillance with biweekly ultrasonography and MCA PSV (peak systolic velocity of middle cerebral artery) Doppler for ten weeks after infection. Cordocentesis should be performed for Complete blood count, reticulocyte count, and PCR for parvovirus B19 DNA if ultrasonography reveals any fetal hydrops, enlargement of the placenta (placentomegaly), liver and spleen enlargement (hepatomegaly, splenomegaly). Or if any raised MCA PSV is observed . In severe cases, intra uterine transfusion may be needed. (7)

The prognosis for both the mother and the fetus depends on the timing of infection during pregnancy, the severity of fetal involvement, and the promptness of interventions. While some pregnancies may proceed without complications after parvovirus B19 infection, others may result in adverse outcomes such as fetal loss or long-term complications for the newborn.

Preventive measures include promoting good hygiene practices, avoiding close contact with individuals known to have fifth disease, and educating pregnant women and healthcare providers about the risks and implications of parvovirus B19 infection. Early recognition and timely management are essential to minimize the impact of the infection on pregnancy outcomes.

CONCLUSION

In conclusion, the case of NIHF due to parvovirus B19 infection underscores the devastating impact of this viral infection on pregnancy outcomes. Parvovirus B19 can cross the placenta, leading to severe fetal complications such as hydrops fetalis, characterized by abnormal fluid accumulation in fetal compartments. Despite efforts to monitor and manage the pregnancy, including serological testing and fetal monitoring, the infection resulted in a tragic stillbirth. This case highlights the critical importance of early recognition, timely intervention, and comprehensive prenatal care in managing infections during pregnancy. Healthcare providers must remain vigilant in educating pregnant women about potential risks and symptoms associated with parvovirus B19, ensuring prompt medical evaluation and appropriate management strategies. Continued research and advancements in prenatal screening and treatment protocols are essential to improve outcomes.

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