Untreated HSV Leading to Neonatal Death: A Case Report

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Abstract

We discuss a case of a 10-day-old infant who presented in fulminant early-onset sepsis due to HSV (Herpes Simplex Virus), the patient ultimately succumbed to illness due to septic shock. The patient's mother received a diagnosis of HSV in the days following delivery. However, without a system in place to connect a maternal diagnosis to the infant, the baby was not treated empirically. We discuss the early signs and symptoms of neonatal sepsis, including those that were present in this patient. Further emphasis is placed on the importance of early detection and prompt treatment of HSV sepsis due to the high mortality rate of the disease, including the potential need for a notification system to inform pediatricians and family practitioners about maternal post-partum diagnoses.

Keywords: Neonatal sepsis, HSV sepsis, Neonatal death, Post-partum HSV

1. Introduction and Patient Information

Sepsis is an important source of morbidity and mortality in neonates. Etiology may include viral, bacterial, or fungal pathogens. Clinical presentation is variable, and early identification and treatment are essential as delayed treatment is associated with poor neonatal outcomes. We present a case of insidious onset of Herpes Simplex Virus (HSV) sepsis in a 10-day-old infant who was treated at our institution after being transferred from a rural outlying hospital.

2. Objectives

The objectives of this case report are to describe a case of HSV sepsis leading to neonatal death including common presenting symptoms. Furthermore, we intend to outline the importance of effective education for parents in conveying the seriousness of HSV in neonates. This case suggests that there may be a need for a notifications system to link maternal post-partum diagnoses, such as HSV and other serious infections, to the

neonate's chart beyond the immediate post-partum period.

3. Case Description

A 10-day-old female born via term vaginal delivery presented for listlessness and seizure-like episodes consisting of "shaking" and "decreased responsiveness." In the free-standing outside ER, the patient presented with the above chief complaint, and during evaluation was found to meet the criteria for septic shock including temperature instability, hypotension despite fluid resuscitation, abnormal leukocyte count, and a suspected source of infection (new primary diagnosis of maternal HSV in the days preceding presentation). The patient was therefore immediately transferred via our life-flight team to the pediatric intensive care unit at Promedica Toledo Hospital. On arrival, the patient was persistently hypotensive, acidotic, and bleeding from her endotracheal tube and puncture sites, suggestive of disseminated intravascular coagulation. History revealed that the infant had one day of decreased oral intake, pale stools, seizure-like tremors, and hypothermia. The patient's mother was GBS positive and treated appropriately with intrapartum penicillin. The mother developed a fever and was diagnosed with HSV a few days following delivery, at the same time that the baby was with her father being evaluated for routine outpatient follow-up newborn care. The baby was well appearing and not empirically treated, since the pediatrician was unaware of maternal HSV diagnosis at this time. In the PICU, a femoral line was placed. Blood and urine cultures were drawn immediately. The patient received aggressive resuscitation and multi-organ support via isotonic normal-saline fluid boluses totaling 80mL/kg, blood products including packed red blood cells and platelets, vasopressors including both epinephrine and norepinephrine, sodium bicarbonate, broad spectrum antibiotics including ampicillin and gentamycin, and acyclovir for empiric coverage of HSV. Despite these measures, patient's condition worsened. Given baby's poor prognosis, her parents decided to withdraw treatment and she passed shortly after. Autopsy revealed disseminated HSV infection with necrosis affecting multiple organs, including the liver, lungs, and adrenal glands.

4. Discussion

Maternal HSV infection may present with genital lesions, or a prodrome consisting of fever, headache, and myalgias (1). Cesarean delivery is recommended for mothers with symptoms, and the neonate should be treated with IV acyclovir for 21 days followed by 6 months of suppressive therapy (2). Infants who are negative for HSV born to a mother with first occurrence should still be treated empirically for 10 days with IV acyclovir (2). Dosing of acyclovir in infants less than three months of age born at a gestation of 35 weeks or greater is 60mg/kg/day, divided into doses every eight hours (3). Acyclovir is generally well-tolerated, however, infants should be monitored for the side effects of renal dysfunction and neutropenia (3). Untreated disseminated HSV in neonates has a high mortality rate, approaching 80% (1). Neonatal sepsis varies in presentation and symptoms are often non-specific. Symptoms may include hyper or hypothermia, poor feeding, pale stools, seizures, lethargy or irritability (4). Acholic or pale stools are a result of cholestasis, a known complication of sepsis, with some studies showing higher rates of mortality in septic neonates presenting with cholestasis (5). However, the biliary system in newborns is immature, sometimes causing cholestasis and physiologic jaundice or pale stools (6). This may lead to delay in recognizing pale stools as a symptom of sepsis. In the case of our patient, the initial symptoms included pale stools followed by poor feeding and lethargy, followed later by seizure-like episodes. In the weeks following delivery, neonates should be monitored closely for signs and symptoms of sepsis, and especially for signs of HSV if concerns for maternal infection arise. HSV should be suspected in septic neonates even if the patient's mother did not have signs or symptoms of HSV during delivery. In this case, it is

likely that the patient's mother was within the prodromal period during delivery, or that the infection was acquired postnatally, which can be associated with higher rates of infant mortality (2). At our institution, maternal and infant electronic medical record (EMR) is linked immediately following delivery and during the infant's admission in the newborn nursery. However, each institution may utilize a different EMR in addition to having unique guidelines for how long the maternal and infant records remain linked. Infants may also receive newborn care at outpatient offices whose EMR may differ from the delivery hospital. A previous study in Oregon, which created a model to link any child's chart (under age 19) to a parent, suggested their algorithm could be utilized to inform both clinical practice and policy change (7). A larger, national study of community health centers was only able to link 33% of child-parent EMRs, and suggested further analysis was necessary to examine how this linkage may affect the children's medical care (8). There is limited data on the impact of maternal-child EMR linkage on neonatal outcomes, which suggests the need for further studies. Our patient's case is an example of a negative outcome from a lack of maternal-infant EMR linkage.

5. Conclusion

This unfortunate outcome reminds us of the importance of early detection and treatment of HSV sepsis. Providers often assume that patients understand the gravity of a diagnosis. Furthermore, patients may assume that their records transfer electronically, and providers are therefore aware of new diagnoses or health-related changes. We should therefore inquire about intra and post-partum maternal infections and provide clear anticipatory guidance on neonatal sepsis risk factors and symptoms. Neonates born to mothers with active HSV infection should be evaluated and treated promptly, including those born to mothers who develop or are diagnosed with HSV in the immediate post-partum period. This case suggests that stricter guidelines for infant treatment may be necessary for maternal HSV developed in the post-partum period. Moreover, this raises the question of provider responsibility in similar situations, and the need for EMR notification systems in addition to prolonged linkage of maternal and child EMR. If a system was in place to notify the neonate's primary care provider about the new maternal diagnosis, this could have resulted in a different outcome for our patient.

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