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Research Article

HELLP Syndrome in the Bronx (NY), US: Risk Factors and Maternal/Fetal Outcomes

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Abstract

Background: HELLP (hemolysis, elevated liver enzymes, low platelet) Syndrome, a severe complication of pregnancy, often in association with preeclampsia, is associated with increased perinatal morbidity and mortality. NYC Health+Hospitals/Lincoln, part of an extensive hospital system throughout New York, is an urban tertiary care hospital located in the South Bronx. The populace of this region consists primarily of patients of African and Hispanic descent and our patients in this study were as such. No exclusions were made based on race. In the current literature, HELLP Syndrome has primarily been described in populations of white, multiparous women over the age of 35. Hereby, we present the first retrospective study of outcomes noted solely in ethnic women affected by HELLP Syndrome.

Objective: Our objective was to evaluate risk factors and maternal and fetal outcomes of ethnic minority groups with pregnancies complicated by HELLP syndrome.

Material and Methods: We conducted a retrospective study, in the time frame of January 1, 2016- January 1, 2019. We collected demographic and obstetrical data inclusive of age, BMI (body mass index), race, parity, and gestational age at diagnosis.

Inclusion criteria were patient's with diagnosis of HELLP syndrome between January 1, 2016 and January 1, 2019. We excluded any patients that were diagnosed with infections, autoimmune phenomena, underlying co-morbidities, and fever.

The variables which were collected were observed maternal outcomes including: mode of delivery, occurrence of postpartum hemorrhage, disseminated intravascular coagulopathy, maternal death, and ICU admission and observed fetal and neonatal outcomes such as: NICU admission, neonatal death, low birth weight, respiratory distress syndrome, APGAR scores, arterial umbilical cord pH at birth.

Results: We found a total of 17 pregnancies complicated by HELLP syndrome in the interested time frame. Of the cohort, 70% were Hispanic and 17% African American.

All patients were younger than 35 years old, median age 26 (23-30). Median BMI was 30.1kg/m2 (25.3-33.5kg/m2). Median gestational age at diagnosis was 34 weeks (28-37). Postpartum diagnosis occurred in 6/17 (35%) of patients.

Nine of the 17 (53%) patients had a cesarean section while eight had vaginal deliveries. Eleven of the 17 (65%) patients were nulliparous at diagnosis while 6 were multiparous. Six of the 17 (35%) deliveries where complicated by postpartum hemorrhage, 5/17 (30%) by ICU admission, 2/17 (11%) by placental abruption. There were no maternal deaths or diagnoses of disseminated intravascular coagulopathy. Neonates had a median of 9/9 APGAR scores at 1 and 5 minutes, respectively. Median arterial cord gas pH was 7.19; with only one neonate with a cord gas pH below 7.15. Neonatal complications included low birth weight (4/17; 24%), respiratory distress syndrome (4/17; 24%), prematurity (11/17; 65%), NICU admission (7/17; 41%), and neonatal death (3/17; 18%).

Conclusion: In our population of Hispanic and African American young women with HELLP syndrome the most prevalent complication, similar to that on review of literature, is that of postpartum hemorrhage and ICU admission, associated with high fetal and neonatal morbidity and mortality rate. It is incumbent on providers caring for this population to be knowledgeable of the likelihood hemorrhage, and to have in place protocols, heightened awareness, and a multidisciplinary staff well equipped in handling obstetrical emergencies such as this.

Future large population studies are needed, including all ethnic groups, in order to identify specific prevention and management opportunities endemic to the population at hand.

Keywords: HELLP Syndrome; Bronx; Hemorrhage

Introduction

HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome was first defined by Weinstein in 1982 [1]. It is a rare life-threating complication of pregnancy that is seen in 0.02-0.8% of pregnancies, occurring in the last trimester or in the early postpartum period [1,2].

The syndrome had been described as a variant, or complication of preeclampsia [3,4]. Although the association between the two syndromes are debatable, HELLP syndrome occurs in 10-20% of women with severe preeclampsia [3-5]. It is an interesting observation however, that 10-20% of patients who present with the syndrome have never been diagnosed with preeclampsia, while 15-20% of patients who are diagnosed with HELLP syndrome lack the clinical findings of hypertension and/or proteinuria [3,5-7].

HELLP syndrome has shown to have an increase in perinatal morbidity and mortality on the maternal fetal dyad [1,2]. Maternal complications such as placental abruption, pulmonary edema with acute respiratory distress, disseminated intravascular coagulation (DIC), cerebral hemorrhage, septic shock, acute renal failure, and subcapsular liver hematoma are prevalent [1,4]. Neonatal complications are most commonly due to pre-term delivery, inclusive of hypoglycemia, bronchopulmonary dysplasia, respiratory distress syndrome, necrotizing enterocolitis, and neonatal death [1,4].

There have been multiple studies within the literature that describe HELLP syndrome published since the initial discovery of the disease. These studies, however were primarily based on a population of white, multiparous women over the age of 35 [9-11].

The aim of this study is to evaluate maternal/fetal characteristics and outcomes of young Hispanic and African American women whose pregnancies were complicated by HELLP syndrome

Materials and Methods

We conducted a retrospective study of pregnancies complicated by HELLP syndrome between January 1, 2016- January 1, 2019. HELLP syndrome was determined by the Tennessee classification System diagnostic criteria for HELLP: hemolysis with increased LDH (>600 U/L,) elevated liver enzymes (AST ≥70U/L), and low platelets (<100x10^9L/) [4]. We excluded any patients that were diagnosed with infections, autoimmune phenomena, underlying co-morbidities, and fever. The populace of this region consists primarily of patients of African and Hispanic descent and our patients in this study were as such. No exclusions were made based on race. Risk factors analyzed were maternal age, BMI, race, parity, and gestational age at diagnosis.

Results

During our study period, 17 cases were found to meet the established criteria for HELLP syndrome. Out of the 17 cases, the maternal age was shown to be less than 35 years in 100% of patients (23-30 years). Eleven of the 17 patients, (65%) were nulliparous. Average BMI was 30.1kg/m2 (25.3-33.5kg/m2). Gestational age at diagnosis/delivery ranged from 24w2d to 38w3d (65% antepartum). Postpartum diagnosis occurred in 35% (6/17) of patients ranging from postpartum day 0 to day 3. The highest prevalence of HELLP syndrome was noted in the Hispanic population at 70% (12/17); followed by African American population at 17% (3/17) (Figure 1). Mode of delivery was cesarean section in 53% (9/17).

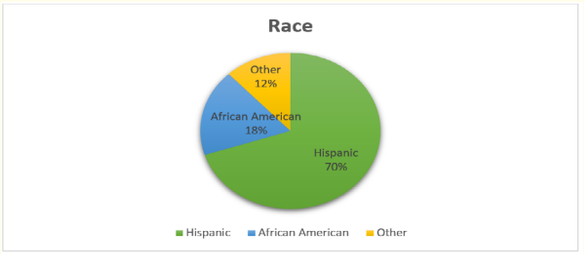

Figure 1: Race distribution in study population of HELLP Syndrome in The Bronx.

Delivery complications of HELLP syndrome where seen in nearly half of the patients, 9/17 (52%). Complications seen -- postpartum hemorrhage in 6/17 (35%), ICU admission in 5/17 (30%), and placental abruption in 2/17 (11%) (Figure 2). There were no maternal deaths or diagnoses of disseminated intravascular coagulopathy.

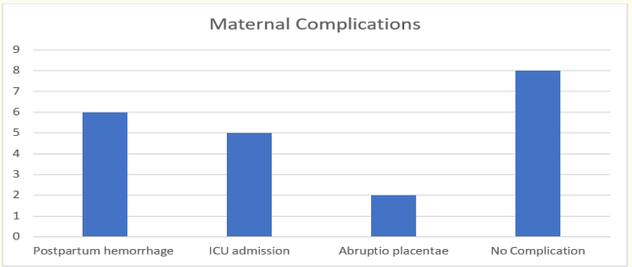

Figure 2: Maternal complications in study population of HELLP Syndrome.

Neonates had a median of 9/9 APGAR scores at 1 and 5 minutes respectively. Median arterial cord gas pH was 7.19; with only one neonate having a cord gas pH of 7.15. Neonatal complications included low birth weight 4/17 (24%), respiratory distress syn-

drome 4/17 (24%), prematurity 11/17 (65%), NICU admission 7/17 (41%), and neonatal death 3/17 (18%) (Figure 3).

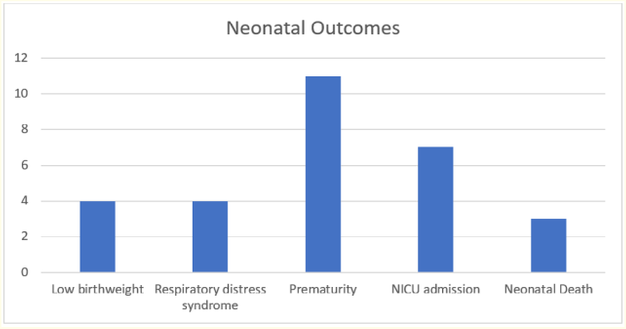

Figure 3: Neonatal outcomes in study population of HELLP syndrome.

Discussion

In our study, we found that all our patients diagnosed with HELLP syndrome were young women less than 35 years of age—quite in contrast with other studies that have shown that it is a syndrome more common in older women. We also found that many of our patients have onset of this syndrome in the immediate postpartum period. Maternal complications most commonly encountered by our patient population were postpartum hemorrhage necessitating massive transfusion protocol and ICU admission. Neonatal complications and deaths were primarily associated with prematurity.

In our study all the patients with HELLP syndrome where under the age of 35, contrary previous studies that tend to show a higher incidence of age. Studies such as Selcuk Erkilmc (mean age 29.7 ± 6.5 years) and Klinik ve laboraturar (mean age of 89.9 ± 7.90 years.) and Naiger Sadaf (mean age 28.23 ± 5.9) and Fitstzpatrick all stated that HELLP syndrome is more common in older women (over the age 35) [9-11,13]. Our study also showed more than half of the women who developed the syndrome were nulliparous (65%). This is different than most other studies that showed multipara women are more likely to develop HELLP syndrome [9-11,14]. A study done by Katheryn Fitzpatrick correlates with our findings that there were a greater number of patients diagnosed with HELLP Syndrome who were nulliparous [13]. HELLP syndrome developed in the postpartum period in 35% of our patients. This correlates to Nigar Sadaf's study where they saw 30% developed postpartum [11].

Limitations of our study include the paucity of patients within our cohort. Our small sample size of 17 patients can be due to the fact the HELLP syndrome is a very rare syndrome.

Many studies within the literature focus primarily on a Caucasian population. Our study population was in keeping with the demographic of pregnant women living in the South Bronx. Focusing on a different population of patients with HELLP syndrome, other than what has been previously described in studies as the common "multiparous Caucasian woman greater than 35 years of age" may explain why our results differ from what the other studies revealed. It is imperative that further research be undertaken to assess the development, presentation, and complications of this syndrome in different ethnicities and patient populations.

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