

Assessment of Fetal Outcome in Hypertensive Disorders Complicating PregnancyNavuluri Arunasri¹, Akula Satyanaraya², Datla Satish³, Rama Krishna Parama Hamsa⁴, T Jaya Chandra⁵¹Senior Resident, department of Paediatrics, GSL Medical College, Rajahmundry.²Associate Professor, department of Paediatrics, GSL Medical College, Rajahmundry.³Associate Professor, department of Paediatrics, GSL Medical College, Rajahmundry.⁴Professor & Head, department of Paediatrics, GSL Medical College, Rajahmundry.⁵Central Research Laboratory, GSL Medical College, Rajahmundry.

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Abstract**Introduction:** High blood pressure in pregnancy (HDP) harms both mothers and babies. It disrupts blood flow, reducing oxygen and nutrients to the fetus. This can lead to stunted growth, premature birth, and even death. Early detection of HDP is crucial for better outcomes. This study explores how HDP impacts fetal health.**Methods:** This hospital study examined how mothers with pregnancy hypertension impact newborns. Excluding other health issues, researchers followed hypertensive mothers receiving prenatal care. With consent, mothers reported health history and newborns were examined. Data on mothers and babies was collected and analyzed to assess the effects of hypertension on fetal outcomes. (74 words)**Results:** The study examined factors affecting newborn health in 82 pregnancies. Magnesium sulfate, C-sections, and earlier preeclampsia diagnosis improved baby outcomes. Maternal pregnancy history (first vs. subsequent) didn't impact baby weight.**Conclusion:** Study finds no link between mom's pregnancy history and baby weight. Magnesium sulfate and earlier preeclampsia diagnosis improve baby weight, likely due to better placenta health and timely intervention.**Keywords:** Parity, Fetal Weight, Magnesium Sulfate, Preeclampsia Diagnosis, Placental Health.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Hypertension in pregnancy, encompassing a spectrum of hypertensive disorders (HDPs), is a leading global threat to both mothers and their developing babies. [1,2] These disorders, including gestational hypertension, preeclampsia, eclampsia, and chronic hypertension with or without superimposed preeclampsia, disrupt the delicate balance of blood flow between mother and fetus. [3] This impaired circulation restricts vital oxygen and nutrient delivery, jeopardizing fetal health and potentially leading to a cascade of complications. [4]

Intrauterine growth restriction (IUGR), where the fetus fails to grow at a healthy rate, is a frequent outcome. [5] Premature birth, depriving the baby of crucial developmental time in the womb, can be triggered by HDP. [4] In severe cases, HDP can lead to fetal hypoxia (oxygen deprivation), stillbirth, and increased rates of neonatal death. [3] This emphasizes the long-lasting ramifications of HDP on offspring health. Early detection of preeclampsia offers a window for intervention and

improved outcomes. The potential of metabolomic analysis for early detection, paving the way for more proactive management strategies. [1] This study aims to comprehensively assess fetal outcomes in pregnancies complicated by HDP.

Methods

It was a hospital based cross-sectional observational study, conducted in the department of Paediatrics, GSL Medical College, Rajahmundry. Study was conducted between January 2021 to March 2022. Study protocol was approved by the Institutional Ethics Committee. Informed written consent was taken from the study members.

The study included all babies born to pregnant mothers who had been diagnosed with hypertensive disorders complicating their pregnancy. The study excluded pregnant mothers with any other co-existing medical conditions (co-morbidities) like diabetes or anemia. This decision aimed to isolate the specific effects of hypertensive disorders on fetal outcomes.

This study investigated the impact of hypertensive disorders on fetal outcomes. After ethical approval, researchers ensured participant confidentiality. Parents underwent a detailed history, including personal and family medical backgrounds. Clinical examinations were performed on mothers registered for antenatal care (ANC) who developed hypertension and planned to deliver at the study hospital. With informed consent, mothers answered questionnaires about prior pregnancies, health conditions, and hypertension history. Their height, weight, symptoms, signs, and blood pressure were documented. Treatment methods and details were recorded for each mother. Newborns were examined and their health documented. Data was collected in a study-specific form and analyzed statistically. Descriptive statistics summarized the data, and chi-square tests assessed associations between categorical variables. A comprehensive clinical workup for all participants included a detailed medical history, physical examination, vitals, and a systemic examination to capture relevant study parameters.

Statistical analysis: All statistical analyses were conducted using SPSS software trial version 20.0 and MS Excel-2010. The Chi-square test was employed to evaluate associations among categorical variables. A P value of <0.05 was deemed statistically significant, indicating meaningful associations between variables.

Results

Among the 82 women in this study, 31 were multigravida and the rest were primigravida; 31 were treated with magnesium sulfate. Most patients (49, 59.8%) underwent LSCS. There were 33 normal vaginal deliveries (9 induced, 7 spontaneous). In the study, 28 babies received APGAR scores between 4 and 7, while 38 babies had scores of 8-10. Magnesium sulfate linked to improved fetal outcomes ($P<0.02$). In this study factors affecting fetal health. Nifedipine treatment, delivery method (C-section showing better outcomes), and gestational age at diagnosis (earlier diagnosis linked to better outcomes) all showed significant positive correlations with fetal outcome ($P<0.001$). Maternal parity had no impact on fetal weight ($P=0.442$). Magnesium sulfate treatment positively correlated with fetal weight ($P<0.02$), while earlier gestational age at diagnosis (above 36 weeks) also resulted in better fetal weight ($P=0.001$).

Discussion

This study investigated delivery outcomes in a group of 82 pregnant women. Among these, 38.1% (31/82) were multigravida (already had one or more pregnancies) while the remaining 61.9% (51/82) were primigravida (first pregnancy) [1]. Magnesium sulfate treatment was administered to

37.8% (31/82) of the patients. Notably, a majority (59.8%, 49/82) underwent Cesarean section (LSCS) deliveries, suggesting a higher surgical intervention rate compared to vaginal deliveries. [6]

Within the vaginal delivery group (40.2%, 33/82), 27.3% (9/33) were induced labors, and 21.2% (7/33) were spontaneous. Apgar scores, which assess a newborn's condition shortly after birth, indicated that 34.1% (28/82) of babies had scores between 4 and 7, which is considered moderately abnormal [2]. However, a reassuring 46.3% (38/82) of babies received scores of 8-10, indicating a healthy condition. [7]

Absolutely, the study you described suggests a multitude of factors influencing fetal health. While magnesium sulfate supplementation demonstrated a positive association with improved outcomes ($p < 0.02$), nifedipine treatment, cesarean delivery, and earlier gestational age at diagnosis exhibited even stronger correlations ($p < 0.001$). Magnesium sulfate is a well-established treatment for preventing eclamptic seizures in pregnant women with preeclampsia. [8] Emerging evidence suggests it might offer neuroprotective benefits to the fetus as well, potentially reducing the risk of cerebral palsy. [9]

Nifedipine is a calcium channel blocker medication used to manage hypertension in pregnancy, including preeclampsia. [9] Studies have shown its effectiveness in improving maternal and fetal outcomes. [9] Cesarean delivery (C-section) has been associated with better fetal outcomes compared to vaginal delivery in certain high-risk pregnancies. [10] This could be due to factors like avoiding complications during labor or reducing the risk of infections. Earlier gestational age at diagnosis of any potential complications during pregnancy is crucial for timely intervention and improved outcomes for both mother and baby. [11, 12] Early prenatal diagnosis allows for better management of conditions that could affect fetal health.

Absolutely, based on the findings, maternal parity seems to have no significant influence on fetal weight ($p = 0.442$). However, two other factors emerged as positive contributors to fetal weight. Supplementation with magnesium sulfate was statistically significant ($p < 0.02$), potentially due to its role in placental development and blood flow. [13] Earlier diagnosis (above 36 weeks) exhibited a strong positive correlation ($p = 0.001$). This aligns with existing research on the advantages of early intervention for pregnancy complications like preeclampsia. [14, 15]

Magnesium sulfate is a well-established therapy for preventing eclamptic seizures in pregnant women with preeclampsia [13]. Emerging evidence

suggests it might offer benefits for fetal development as well. Studies have shown that magnesium sulfate supplementation may improve placental blood flow and function, potentially contributing to a healthier pregnancy environment and better fetal weight [13]. The link between gestational age and fetal weight is well-documented. As pregnancy progresses, the fetus naturally grows and gains weight. Earlier diagnosis of any potential complications during pregnancy allows for timely intervention and management, which can significantly improve fetal outcomes, including birth weight [14, 15].

In this study, maternal parity did not influence fetal weight. Magnesium sulfate treatment ($p < 0.02$) and earlier gestational age at diagnosis (above 36 weeks, $p = 0.001$) emerged as significant positive factors. Magnesium sulfate potentially improves placental health, while earlier diagnosis allows for timely intervention, both contributing to better fetal weight. These findings highlight the importance of prenatal care and timely management of pregnancy complications for optimal fetal health.

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