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Comprehensive Clinical Review on Challenges, Interventions and Outcome of Postpartum Hypertension: A Multifaceted Case Series Analysis

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Abstract

Postpartum hypertension presents a significant health concern for mothers following childbirth. This case series provides a comprehensive analysis of cases seen at a medical facility, with the goal of shedding light on the various presentations, management approaches, and outcomes related to this condition. These cases encapsulate varying clinical scenarios from severe hypertension with symptoms of preeclampsia to the emergence of postpartum complications such as HELLP syndrome and eclampsia in others. Each case underscores the critical importance of prompt diagnosis and tailored intervention. Prompt initiation of treatment led to positive outcomes in most cases, emphasizing advocating awareness, early recognition, and tailored interventions for postpartum hypertension to lower maternal risks.

Keywords: Eclampsia, HELLP Syndrome, Postpartum Hypertension, Preeclampsia.

Introduction

Blood pressure typically reaches its peak between three to six days after childbirth in women, regardless of whether they have a history of normal blood pressure or previous hypertension (1, 2) Postpartum hypertension is characterized by increased blood pressure following childbirth and encompasses a range of disorders, from mild to severe conditions like preeclampsia, eclampsia, or HELLP syndrome, significantly impacting maternal health. This condition, affecting roughly 2% of pregnancies, extends from delivery through six weeks postpartum and includes persistent or worsening hypertension arising from complex pregnancies or de novo disease after uncomplicated pregnancies (3, 4). Most cases stem from gestational hypertension or preeclampsia, with a fraction due to exacerbated chronic hypertension or superimposed preeclampsia. Risk factors include maternal age, parity, BMI, and labor duration. (5-7). approximately 5.7% of cases with preeclampsia or eclampsia develop spontaneously in the postpartum period, frequently presenting with chronic headaches or visual abnormalities (8). Despite medical advancements, postpartum hypertension remains a challenge due to varied clinical presentations and intricate contributing factors such as genetic, immunological, vascular, and environmental elements. Studies have identified diverse disease phenotypes in patients with persistent hypertension beyond six weeks postpartum, highlighting the need for a nuanced understanding and customized management due to its potential rapid progression and associated complications (9). The case series delves into postpartum hypertensive disorders, unveiling their diverse clinical manifestations. From sudden spikes in blood pressure post-delivery to unexpected occurrences in well-controlled chronic hypertension, each case highlights the unpredictability of these conditions. These scenarios showcase associated symptoms like proteinuria and visual disturbances, emphasizing the need for prompt diagnosis. Early recognition and tailored interventions, including antihypertensive therapy, prove pivotal in managing these disorders effectively. The series aims to refine protocols, advocating heightened awareness and precise interventions to enhance maternal health outcomes, emphasizing the

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necessity for a deeper understanding to mitigate postpartum hypertension's impact on maternal health.

Case Series

Case 1: This case involves a primigravida in her early twenties at 33 weeks gestation with triplets conceived through intra cytoplasmic sperm injection (ICSI), where the course from admission to postoperative period was marked by various challenges. Initially presenting with pedal edema, the patient's antenatal period seemed uneventful. An emergency cesarean section was done in view of triplets in labour. Despite no prior health concerns beyond hypothyroidism and a cervical encirclage, the intrapartum and postoperative period had critical events. During the cesarean section, after the delivery of the triplets, atonicity of the uterus was noted and there was major postpartum hemorrhage, demanding medical and surgical interventions to manage bleeding. B-Lynch sutures (Figure 1), bilateral uterine artery ligation and bilateral ovarian artery ligation were done. Bleeding was controlled. There was Elevated blood pressure during surgery which was addressed. Blood and blood product transfusion was done both intra operatively and post operatively. Few hours Post-surgery, the patient had a rise in blood pressure of 150/100mmHg followed by which patient had eclampsia. Magnesium sulphate cover was given to prevent further neurological sequelae. Ophthalmological evaluations revealed signs of Grade 2 papilledema and retinal detachment, indicating ocular involvement due to hypertension and was managed conservatively for the same. MRI revealed Posterior Reversible Encephalopathy Syndrome (PRES, Figure 2).Pre-eclampsia workup was done. Lab findings showed urine protein 3+ , urine spot PCR of 1.3, features of haemolysis, platelet reduction, high D-dimer levels, and liver function derangements , indicating multi-organ involvement, complicating postoperative care. The patient was diagnosed as a case of Severe Preeclampsia with HELLP Syndrome. Intensive monitoring by specialists in ophthalmology, neurology, cardiology, nephrology, and general physician was crucial. Each specialist's input addressed complications stemming from the postpartum period. By post-operative day 6 her blood pressures were under control and lab parameters returned to moral. While the patient received extensive care, premature new-borns were in the NICU for 36 days before stable discharge. Post-discharge, the patient was advised to continue antihypertensive, Blood pressure monitoring at home, vitamin supplements, dietary guidelines, and follow-ups with specialists. The patient was reviewed after 2 weeks. Antihypertensive medications were stopped as her blood pressure normalized. This case stresses meticulous prenatal care's significance, especially in high risk pregnancies. It emphasizes challenges in postoperative phase, urging multidisciplinary approach, delivery in tertiary care centres, quick interventions, and exhaustive care for optimal outcomes.

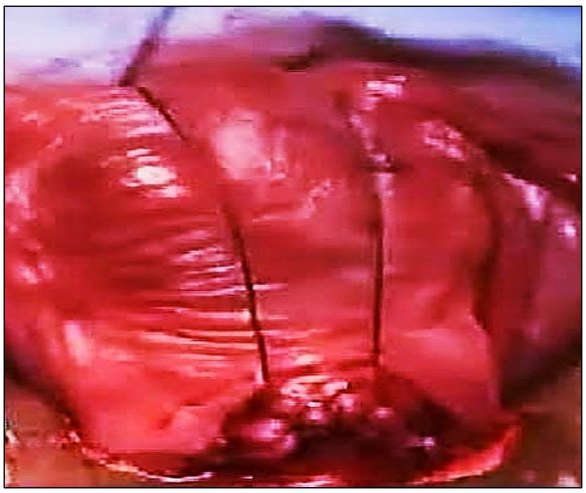

Figure 1: B-Lynch Suture

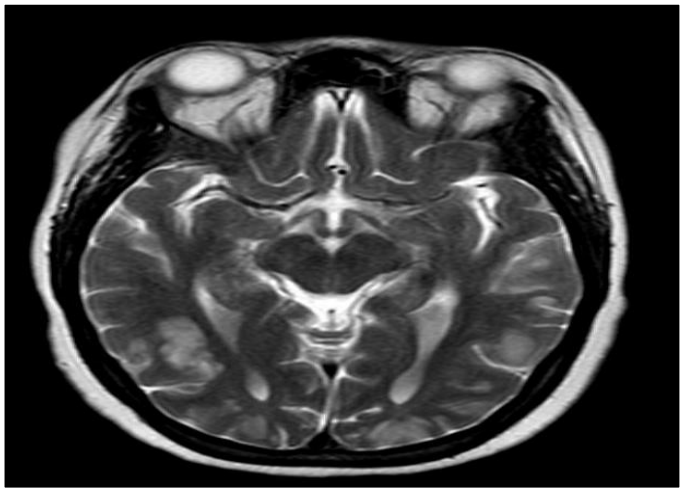

Figure 2: MRI Image - PRES (Parieto Occipital Region)

Case 2: This complex case revolves around a patient, a G4P3L1D2 with Overt Diabetes, previously managed with insulin and metformin, who underwent an elective lower segment caesarean section (LSCS) and sterilization at 36 weeks in view of previous LSCS with Overt DM and bad obstetric history. Despite meticulous antenatal care, consistent challenges in managing blood sugar levels persisted throughout the pregnancy. The patient's admission primarily aimed to regulate her blood glucose levels while monitoring the pregnancy. During the postoperative phase following the elective LSCS, attention turned significantly toward managing hypertension, which emerged as a critical concern. Initially, the postoperative period appeared smooth, but on POD 6, elevated blood pressure levels became a pronounced issue. Evaluations and interventions were initiated to address this newfound hypertensive challenge. Medication modifications were employed to stabilize the patient's blood pressure. Despite efforts, the hypertension persisted, leading to further investigations to rule out potential underlying causes. A renal artery doppler study was conducted, which showed normal results, indicating no immediate cause for concern regarding renal artery-related hypertension. The medical team aided in adjusting the patient's medication regimen to manage both her blood pressure and glycemic control. With a multidisciplinary approach involving obstetricians , physicians and dieticians, the focus remained steadfast on achieving stable blood pressure (using beta blockers and calcium channel blockers) and blood glucose levels (using insulin and oral hypoglycemic drugs) . The intricate treatment demanded frequent adjustments in medications for hypertension and glycemic control. The dedicated team monitored and eventually stabilized the blood pressure. The recovery plan emphasized continued monitoring and adjustments for optimal postoperative care in patients with diabetes complicating pregnancy. Patient was reviewed after two weeks with normal blood pressure reading and therefore, antihypertensive were stopped. Patient was advised to follow up with the Diabetologist for the treatment of Diabetes.

Case 3: In this case, the patient in her twenties was a primigravida at 36 weeks and 6 days of gestational age. She was admitted due to threatened preterm labor, presenting with lower abdominal pain, pedal edema. Despite no prior history of hypertension or diabetes, during her hospitalization, she encountered several critical events. The patient underwent an emergency caesarean section (LSCS) in view of fetal distress. Atonic postpartum haemorrhage was encountered which was managed by medical and surgical methods which included Hayman's compression sutures (Figure 3) and bilateral uterine artery ligation. Intraoperatively, the patient's blood pressure surged drastically to 230/120 mmHg, for which immediate intervention with intravenous infusion labetalol and loading dose of Inj. Magnesium sulfate was given to stabilize her condition. The postoperative phase unfurled with intensified challenges. Post operatively, the patient was transferred to the ICU for further management where she had an episode of Eclampsia which was managed with IV antihypertensive and IV sedation. Magnesium sulfate cover was continued.

Preeclampsia workup was done and interpreted to be normal. MRI brain was done to rule out the absence of significant issues like cerebral venous thrombosis (CVT) and was found to be normal. Deep vein thrombosis prophylaxis was ensured. Amidst these complexities, diligent care was provided to manage the patient's post-eclampsia state. Gradually, the intravenous antihypertensives were changed to oral medications .An overall improvement in the patient's condition was seen. Vigilant blood pressure monitoring was done throughout her hospital stay. Patient was discharged after her health condition improved. Advice at discharge encompassed vitamin supplements, home blood pressure monitoring, and continuation of antihypertensive medications, lifestyle advice, contraception guidance, and follow-ups. Patient was reviewed after two weeks. Anti hypertensives were tapered and later stopped as her blood pressure was under control. Rigorous monitoring, interventions, and assessments and a multidisciplinary approach facilitated a smooth recovery.

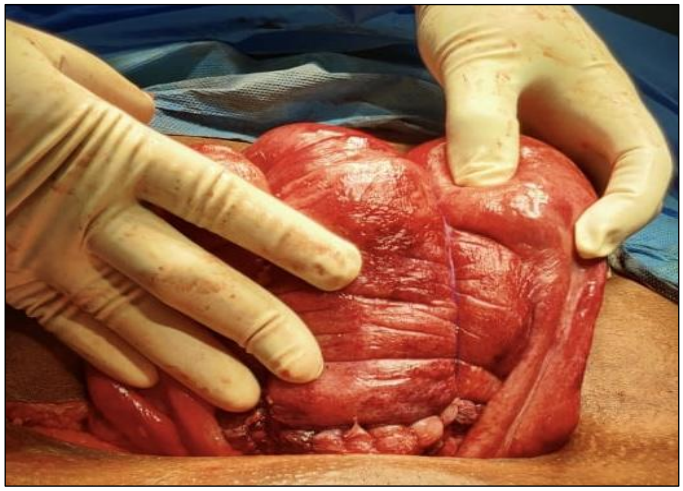

Figure 3: Hayman Suture

Case 4: This Case involves a pregnant woman, G2P1L1 , with a history of a previous lower segment caesarean section (LSCS), admitted at 38 weeks and 2 days of gestation for an elective LSCS due to a previous caesarean section with Cephalo pelvic disproportion . The patient had a mild anaemia but no other concerning symptoms like bleeding per vaginum, abdominal pain, fever, or urinary complaints. The obstetric history throughout the trimesters appeared unremarkable without any significant complications .On examination, the patient had Grade 1 bilateral pitting pedal edema. An elective lower segment caesarean section with sterilization was performed successfully. However, postoperatively, complications emerged. The patient developed severe pre-eclampsia with partial HELLP syndrome (EL-Elevated Liver enzymes), characterized by high blood pressure (BP) readings and abnormal laboratory findings of deranged liver function tests and decreasing trend of platelet count but within normal limits. The postoperative management was intricate and comprehensive. Few hours after the caesarean section , the patient had a spike in her Blood pressure of 130/100mmHg , blood pressure was rechecked and was recorded to be 140/130mmHg .Intravenous Labetalol and magnesium sulfate cover was given to control hypertension and prevent seizures associated with pre-eclampsia. The patient was transferred to the Intensive Care Unit for closer monitoring. Low molecular weight Heparin was started as a prophylaxis for Deep vein thrombosis. Ophthalmologist consultation was sought, to rule out complications like hypertensive retinopathy and to ensure that the patient's condition remained stable. The patient's laboratory parameters fluctuated post-surgery, with variations in haemoglobin levels, platelet counts, and liver function tests. However, the renal function tests remained normal throughout the hospital stay. The treatment plan included analgesics, antibiotics, antihypertensives and supplements like calcium and iron. Patient's progress was closely monitored, and gradual improvement in her condition was noted. By the tenth post-operative day, blood pressure was under control and laboratory parameters

normalised and there were no concerning symptoms or signs. The patient was discharged with tailored medications: T. Labetalol for blood pressure control and other vitamin supplements. Discharge guidance covered diet, fluids, breastfeeding, and monitoring warning signs. The patient was discharged in stable condition, setting a path for recovery. Advice regarding compliance to medicines, and postpartum care was given. Patient was reviewed after two weeks with blood pressure readings which were normal. Therefore; antihypertensives were tapered and later stopped. The case highlighted managing post-op complications from pre-eclampsia, emphasizing ongoing complexities.

Case 5: This Case involves a primigravida admitted at 36 weeks who presented with pedal edema, anaemia, hepatosplenomegaly with thrombocytopenia, and suspected left adrenal angiomyolipoma. On admission, routine investigations revealed moderate anaemia and thrombocytopenia. The patient was managed with blood transfusions, specialist consultations, and thorough evaluations. During the hospital stay, a multidisciplinary approach was adopted to address the patient's condition. An ultrasound revealed a left adrenal myoangiolipoma. Rheumatology and surgical oncology consultations were sought, with inconclusive findings regarding the significance of positive Antinuclear Antibody (ANA) and the left adrenal mass. Patient had Prelabour rupture of membranes (PROM) at term and underwent an emergency lower segment cesarean section (LSCS) due to cephalopelvic disproportion (CPD) under spinal anaesthesia and an alive girl baby was delivered. However, postoperatively, the patient faced challenges with persistent elevated blood pressure, reaching up to 160/110 mmHg on the day of the surgery. Patient was transferred to the Intensive care unit. Pre-eclampsia work up was done which revealed significant proteinuria and thrombocytopenia which led to the diagnosis of Severe Pre-eclampsia. Treatment initially involved Magnesium sulphate cover, intravenous labetalol followed by oral antihypertensive medications. Tab. Atenolol was started on the third postoperative day. Blood pressures were under control by the post-operative day 5. Post-op, an MRI confirmed a left adrenal adenoma and hepatosplenomegaly. Oncologists suggested adrenalectomy in six months. Vitamin and Iron supplements to treat anaemia, and further evaluations were advised, outlining follow-ups. Discharge advice included vitamin and mineral supplements, Anti-hypertensive medications, diet recommendations, and home blood pressure monitoring. The patient received guidance on alarming signs. At discharge, vitals were stable and wound healing was good. The patient showed progress in recovery. The patient was reviewed after 2 weeks with Complete blood counts which showed normal platelet counts of 1.74 L/mm^3 and Hb of 10.4g .Patient was asked to review in the Oncology Outpatient department for adrenalectomy after 6 months. This case highlighted post-op hypertension complexities and management in the postpartum phase.

Discussion

The most recent guidelines from the “American College of Obstetricians and Gynaecologists (ACOG)” in “2019” have revised the definition of preeclampsia, eliminating the necessity of proteinuria as a defining factor (10). Severe blood pressure levels alone can now indicate preeclampsia with severe features, even without signs indicating organ damage. Additionally, definitions of hypertension have evolved outside of pregnancy. The "American College of Cardiology (ACC)" and the "American Heart Association (AHA)" set tighter criteria for class I hypertension in 2017, designating systolic blood pressure as 130-139 mm Hg or diastolic blood pressure as 80-89 mm Hg. (11). In 2019, "ACOG's updated guidelines for chronic hypertension in pregnancy" recommended continued blood pressure treatment for previously diagnosed chronic hypertension, aligning with stricter class I hypertension parameters but not redefining hypertensive disorders of pregnancy (HDP) parameters (12). Research, including substantial retrospective analyses covering over 18,000 patients, indicated that class I hypertension correlated with heightened risks of “HDP, preterm birth, and adverse perinatal outcomes” (13, 14). Embracing the stricter ACC/AHA guidelines might diagnose up to 20% more pregnant patients with postpartum hypertension, previously considered normotensive under older criteria. Nonetheless, the long-term outcomes of postpartum class I hypertension are uncertain (15). This case series underscores various essential aspects of managing pregnancies entangled with complex medical

histories and diverse complications. Each case underscores the need for a comprehensive approach to obstetric care, considering individual patient histories, presenting symptoms, and subsequent management protocols. The presented cases collectively depict the intricate landscape of managing diverse pregnancy complications. Case 1 involves handling multiple gestations, atonic postpartum haemorrhage (PPH), and concurrent medical conditions, showcasing the critical role of surgical interventions and meticulous post-operative care in complex obstetric scenarios. Case 2 delves into managing pregnancies complicated by Overt Diabetes, revealing the delicate balance between glycemic control and successful delivery, emphasizing tailored medical management through insulin therapy, hypertension management and comprehensive assessment. Case 3 navigates threatened preterm labor and eclampsia, emphasizing pivotal decisions during emergency caesarean sections and subsequent monitoring. Case 4 underscores the assessment and management of Partial HELLP syndrome. Finally, Case 5 sheds light on challenges posed by conditions like hepatosplenomegaly and pre-eclampsia, highlighting the need for comprehensive maternal-fetal health management, including vigilant monitoring and timely interventions. Together, these cases emphasize a holistic approach to obstetric care, integrating thorough history-taking, detailed antenatal evaluations, appropriate surgical interventions, and comprehensive postpartum care. They underscore the critical role of multidisciplinary collaboration among obstetricians, anaesthetists, neonatologists, physicians and various specialties to ensure optimal outcomes for both mother and baby. Moreover, they stress on surveillance, diligent follow-ups, and tailored post-discharge guidance, evident in the cases' discharge advice. This comprehensive approach aims to mitigate complications, support recovery, and ensure long-term well-being for both mother and new-born.

Conclusion

This case series underscores the intricate nature of postpartum hypertensive disorders, revealing their multifaceted manifestations and varied trajectories. Highlighting the urgency of timely recognition and tailored interventions, it emphasizes the pivotal role of precise management strategies, ensuring favourable maternal outcomes. By advocating increased awareness, refined protocols, and enhanced clinical suspicion, this series contributes to the imperative task of improving maternal health. The complexities surrounding postpartum hypertension necessitate a comprehensive understanding to devise effective strategies that mitigate its impact, ultimately striving towards safeguarding maternal well-being in the critical postpartum period.

Abbreviation

Nil.

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Author Contributions

Each authors contributed equally.

Conflict of Interest

The authors declare no conflict of interest.

Ethics Approval

The patient has given consent for the publication and uses the images.

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