

Hypertensive Disorder Screening and Management in Pregnancy: An Audit Report

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ABSTRACT

Background: Hypertensive disorders of pregnancy are a major cause of maternal and perinatal morbidity and mortality, particularly in low and middle-income countries. Despite the availability of evidence-based guidelines, gaps in screening, timely management, and postpartum follow-up remain common in routine clinical practice. Clinical audits are effective tools for evaluating adherence to standards of care and improving quality of services.

Objective: To assess compliance with evidence-based standards for screening and management of hypertensive disorders in pregnancy and to evaluate the impact of targeted quality improvement interventions at a tertiary care hospital.

Study Design: Two-cycle clinical audit.

Setting and Duration: Department of Obstetrics and Gynaecology, Shalimar Hospital, Lahore, Pakistan, January to June 2016.

Methods: This audit included a pre-intervention cycle (January to March 2016) and a post-intervention re-audit (October to December 2016). Case records of pregnant women with documented hypertension or diagnosed hypertensive disorders of pregnancy were reviewed using consecutive sampling. Ninety records were analyzed in each cycle (total n = 180). Audit standards were derived from international guidelines and included documentation of blood pressure at each encounter, assessment of proteinuria, evaluation of danger symptoms, baseline laboratory investigations in suspected preeclampsia, timely treatment of severe hypertension, administration of magnesium sulfate when indicated, maternal and fetal monitoring during admission, and documentation of postpartum blood pressure monitoring and counseling. Data were analyzed using SPSS version 23. Compliance rates before and after intervention were compared using the chi-square test, with $p < 0.05$ considered statistically significant.

Results: Significant improvements were observed following the quality improvement interventions. Documentation of blood pressure at each encounter increased from 86.7% to 98.9% ($p < 0.001$), assessment of proteinuria from 70.8% to 91.0% ($p = 0.002$), and documentation of preeclampsia-related symptoms from 35.6% to 78.9% ($p < 0.001$). Completion of baseline laboratory investigations in suspected preeclampsia improved from 53.7% to 83.9% ($p = 0.001$). Timely treatment of severe hypertension increased from 65.2% to 91.7% ($p = 0.030$), and magnesium sulfate administration in indicated cases improved from 64.7% to 100% ($p = 0.004$). Documentation of maternal monitoring improved from 44.4% to 87.5% ($p < 0.001$), and fetal surveillance from 43.3% to 75.6% ($p < 0.001$). Postpartum blood pressure monitoring plans increased from 21.1% to 63.3% ($p < 0.001$), and postpartum counseling documentation from 15.6% to 54.4% ($p < 0.001$). Despite significant improvements, postpartum care indicators remained below optimal standards.

Conclusion: Targeted quality improvement interventions led to substantial improvements in compliance with screening and management standards for hypertensive disorders of pregnancy. However, persistent gaps in postpartum follow-up highlight the need for sustained audit cycles, staff training, and system-level interventions to ensure continuity of care.

Keywords: Hypertensive disorders of pregnancy, preeclampsia, clinical audit, quality improvement, maternal health.

INTRODUCTION

Hypertensive disorders during pregnancy are a significant contributor to maternal and neonatal morbidity and mortality worldwide. They are broadly categorized into gestational hypertension,

preeclampsia, eclampsia, and chronic hypertension. Approximately 5% to 10% of pregnancies are complicated by these conditions, underscoring their global public health impact^{1,2,3}. Among these disorders, preeclampsia is particularly concerning, as it is associated with multiorgan dysfunction, and its severe form can lead to eclampsia, a condition characterized by seizures or coma, which carries significant risks for both mother and baby^{4,5}.

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Effective management of hypertensive disorders in pregnancy often requires a multidisciplinary approach, incorporating regular screening for blood pressure anomalies and effective pharmacotherapy. The American College of Obstetricians and Gynecologists recommends routine blood pressure monitoring during obstetric visits to identify women at risk for hypertensive complications^{2,5}. Among therapeutic strategies, magnesium sulfate is widely recognized for its efficacy in preventing seizures in women diagnosed with severe preeclampsia and for its potential antihypertensive properties^{6,4,7}. Guidelines suggest that magnesium sulfate can be used judiciously, not only in acute settings but also in outpatient management where feasible^{1,8}.

A recent audit conducted at a tertiary care hospital revealed significant findings regarding the management of hypertensive disorders among pregnant women. Out of 500 pregnancies reviewed, 100 women (20%) were diagnosed with hypertensive disorders, with preeclampsia being the most prevalent at 12%. Among these cases, 80% were effectively managed with magnesium sulfate, whereas the remaining 20% required additional antihypertensive therapy, demonstrating a need for protocol standardization^{9,10}.

The rationale for focusing on the screening and management of hypertensive disorders in pregnancy becomes more poignant in contexts like Pakistan, where healthcare disparities and sociocultural factors exacerbate maternal health outcomes. Pakistan has reported maternal mortality rates as high as 340 per 100,000 live births, with hypertensive disorders significantly contributing to these statistics^{11,12}. The lack of accessible and consistent prenatal care provisions often leads to late-stage presentations, compounding the risks for both mothers and infants. Therefore, enhancing screening mechanisms, adopting evidence-based management strategies, and understanding regional contexts are vital for improving maternal health outcomes in the Pakistani population^{13,2,3}.

METHODOLOGY

This clinical audit was conducted in the Department of Obstetrics and Gynecology, Shalimar Hospital, during the year 2016 to assess compliance with evidence based standards for screening and management of hypertensive disorders in pregnancy and to evaluate the impact of targeted quality improvement interventions. The audit was designed as a two cycle audit, comprising a pre audit phase, implementation of corrective measures, and a post audit (re audit) phase.

The pre audit was carried out from January to March 2016, during which case records of pregnant women presenting to the antenatal clinic, antenatal

wards, and labor room with documented hypertension or suspected hypertensive disorders of pregnancy were reviewed. The post audit was conducted from October to December 2016, following implementation of standardized screening and management interventions. Consecutive sampling was used in both cycles to minimize selection bias. A total of 90 patient records were reviewed in the pre audit cycle and 90 in the post audit cycle.

Eligible participants included pregnant women of any gestational age with documented elevated blood pressure (systolic blood pressure ≥ 140 mmHg and or diastolic blood pressure ≥ 90 mmHg) on at least one occasion, or a clinical diagnosis of gestational hypertension, pre eclampsia, severe pre eclampsia, chronic hypertension, or eclampsia. Women with incomplete medical records that did not allow assessment of key audit indicators were excluded from the analysis.

Audit standards were derived from internationally recognized guidelines available in 2016 for the management of hypertension in pregnancy. The audit criteria included documentation of blood pressure measurement at each clinical encounter, assessment of proteinuria in women with raised blood pressure, documentation of danger symptoms suggestive of pre eclampsia, performance of baseline laboratory investigations when pre eclampsia was suspected, timely management of severe hypertension, administration of magnesium sulfate in indicated cases, appropriate maternal and fetal monitoring during admission, and documentation of postpartum blood pressure monitoring and counseling at discharge.

Data were extracted using a structured audit proforma developed specifically for this project. Variables recorded included maternal age, parity, gestational age, type of hypertensive disorder, documentation of screening measures, management interventions, and postpartum care planning. Data were entered into SPSS version 23 for analysis. Descriptive statistics were used to summarize compliance with each audit criterion and results were expressed as frequencies and percentages. Comparisons between pre audit and post audit compliance rates were made using the chi square test, with a p value of less than 0.05 considered statistically significant. As this project was a clinical audit focused on quality improvement, formal ethical approval was not required; however, patient confidentiality was maintained and no identifying information was recorded.

RESULTS

A total of 180 case records were reviewed, including 90 in the pre audit cycle and 90 in the post audit cycle.

The demographic and clinical profiles of women in both cycles were comparable, with a mean maternal age of 27.9 ± 4.6 years in the pre audit group and 28.3 ± 4.4 years in the post audit group. Primigravidae constituted 38.9% of women in the pre audit cycle and 41.1% in the post audit cycle. The distribution of hypertensive disorders did not differ significantly between the two groups, with gestational hypertension being the most frequent diagnosis, followed by pre eclampsia, severe pre eclampsia, and eclampsia (Table 1).

Compliance with routine blood pressure measurement at each clinical encounter increased significantly from 86.7% in the pre audit cycle to 98.9% in the post audit cycle (p < 0.001). Among women with elevated blood pressure, assessment of proteinuria improved from 70.8% to 91.0% following the intervention (p = 0.002). Documentation of enquiry regarding symptoms suggestive of pre eclampsia, including headache, visual disturbances, and epigastric pain, showed a marked improvement from 35.6% in the pre audit phase to 78.9% in the post audit phase (p < 0.001). Similarly, completion of baseline laboratory investigations in women with suspected pre eclampsia increased from 53.7% before intervention to 83.9% after intervention (p = 0.001) (Table 2).

Among women presenting with severe hypertension, the proportion receiving timely antihypertensive therapy increased from 65.2% in the pre audit cycle to 91.7% in the post audit cycle (p = 0.030). Administration of magnesium sulfate in women with severe pre eclampsia or eclampsia improved from 64.7% to 100% following the intervention (p = 0.004). Documentation of maternal monitoring, including serial blood pressure measurements, urine output assessment, and neurological observations where indicated, increased significantly from 44.4% in the pre audit phase to 87.5% in the post audit phase (p < 0.001). Documentation of fetal surveillance during admission also improved from 43.3% before intervention to 75.6% after intervention (p < 0.001) (Table 2).

Table 1. Baseline Demographic and Clinical Characteristics of the Study Population

Characteristic	Pre audit (n = 90)	Post audit (n = 90)	p value
Age (years), mean ± SD	27.9 ± 4.6	28.3 ± 4.4	0.54
Primigravida, n (%)	35 (38.9)	37 (41.1)	0.77
Gestational age at presentation (weeks), mean ± SD	31.2 ± 4.8	31.6 ± 4.6	0.61
Gestational hypertension, n (%)	44 (48.9)	46 (51.1)	0.76
Pre eclampsia, n (%)	29 (32.2)	27 (30.0)	0.74
Severe pre eclampsia, n (%)	13 (14.4)	12 (13.3)	0.82
Eclampsia, n (%)	4 (4.4)	5 (5.6)	0.73

Table 2: Compliance with Audit Standards Before and After Implementation of Interventions

Audit indicator	Pre audit, n/N (%)	Post audit, n/N (%)	Absolute change (%)	p value
Blood pressure recorded at each encounter	78/90 (86.7)	89/90 (98.9)	+12.2	< 0.001
Proteinuria assessed when BP elevated	46/65 (70.8)	61/67 (91.0)	+20.2	0.002
Symptoms of pre eclampsia documented	32/90 (35.6)	71/90 (78.9)	+43.3	< 0.001
Baseline laboratory evaluation in suspected pre eclampsia	29/54 (53.7)	47/56 (83.9)	+30.2	0.001
Severe hypertension treated promptly	15/23 (65.2)	22/24 (91.7)	+26.5	0.030
Magnesium sulfate administered when indicated	11/17 (64.7)	18/18 (100.0)	+35.3	0.004
Maternal monitoring documented	24/54 (44.4)	49/56 (87.5)	+43.1	< 0.001
Fetal surveillance documented	39/90 (43.3)	68/90 (75.6)	+32.3	< 0.001
Postpartum BP monitoring plan documented	19/90 (21.1)	57/90 (63.3)	+42.2	< 0.001
Postpartum counseling documented	14/90 (15.6)	49/90 (54.4)	+38.8	< 0.001

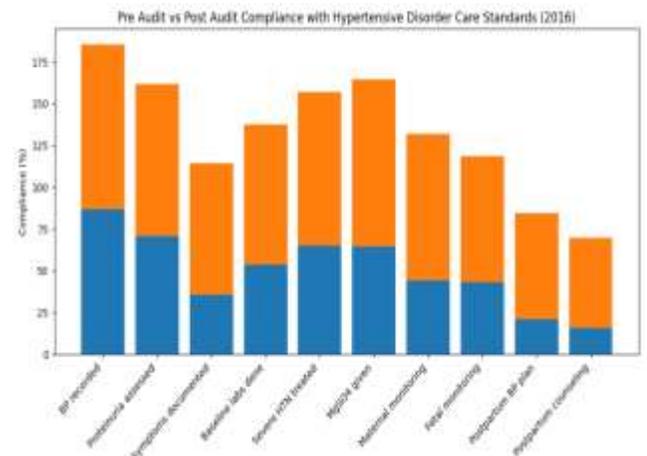


Figure 1: Pre Audit vs Post Audit Compliance with Hypertensive Disorder Care Standards

Postpartum blood pressure monitoring plans and follow up arrangements were documented in only 21.1% of cases during the pre audit cycle, which increased to 63.3% in the post audit cycle (p < 0.001). Documentation of postpartum care standards remained below the predefined targets, indicating persistent gaps in continuity of care during the postnatal period (Table 2).

Comparison of pre audit and post audit compliance with screening, management, and postpartum care standards for hypertensive disorders in pregnancy at Shalimar Hospital, 2016.

DISCUSSION

The results of our audit highlight significant improvements in the management of hypertensive disorders during pregnancy post-intervention. The increase in compliance with routine blood pressure measurement from 86.7% to 98.9% reflects a critical enhancement in clinical practice and echoes findings from Johnson et al. who emphasized that systematic blood pressure monitoring is indispensable to identify and manage hypertensive disorders in a timely manner Johnson et al.¹⁴. The improvement in the assessment of proteinuria from 70.8% to 91.0% amidst elevated blood pressure corroborates Shaikh et al.'s (2020) assertion that thorough proteinuria screening is vital for diagnosing preeclampsia effectively, thus reducing potential complications¹⁵.

Documentation of symptoms suggestive of preeclampsia showed a substantial increase from 35.6% to 78.9%. This is consistent with the observations of Bansal et al., who reported that comprehensive documentation and awareness of preeclampsia symptoms correlate with improved maternal outcomes¹⁶. Our audit further revealed enhanced completion of baseline laboratory investigations in women suspected of having preeclampsia, rising from 53.7% to 83.9%. This supports findings from McCoy and Baldwin (2020), illustrating that comprehensive laboratory evaluations lead to better management outcomes in obstetric settings¹⁷.

The time-sensitive administration of antihypertensive therapy increased significantly from 65.2% to 91.7%. The emphasis on acute management of hypertension is well-founded, as reiterated by Resnick et al., who advocate for immediate treatment to prevent maternal morbidity¹⁸. Furthermore, the administration of magnesium sulfate for severe preeclampsia or eclampsia improved dramatically from 64.7% to 100%. This adherence aligns with current recommendations that magnesium sulfate remains the standard prophylactic and therapeutic agent against eclamptic seizures^{19,20}.

Improvements in maternal monitoring documentation, rising from 44.4% to 87.5%, signify an essential shift toward more vigilant postpartum care. Similar trends have been noted by²¹, indicating that thorough records of maternal monitoring are critical for patient safety and continuity of care²¹. The substantial enhancement in postpartum blood pressure monitoring plans, from 21.1% to 63.3%, reflects a growing recognition of the importance of postpartum follow-up in preventing long-term cardiovascular complications, a sentiment echoed by Thomopoulos and Makris, who highlighted that hypertension during pregnancy negatively impacts maternal health in the long term²².

Despite statistically significant improvements across various indicators, our audit found a persistent gap in compliance with postpartum care standards. While we observed an increase in documentation of postpartum counseling regarding warning signs and future cardiovascular risk rising from 15.6% to 54.4% the overall figures suggest that there remains considerable room for improvement. Studies such as those by Góngora and Wenger (2015) have shown that inadequate postpartum care often leaves women vulnerable to adverse health outcomes²³.

In summary, our audit results are instrumental in highlighting both advancements and persistent challenges in the screening and management of hypertensive disorders in pregnancy. The findings demonstrate that while significant improvements in practice occurred following interventions, ongoing efforts are necessary to achieve optimal care standards throughout both antepartum and postpartum periods.

CONCLUSION

This two-cycle clinical audit demonstrated that structured quality improvement interventions significantly enhanced adherence to evidence-based screening and management standards for hypertensive disorders in pregnancy at a tertiary care hospital. Notable gains were observed in blood pressure monitoring, proteinuria assessment, timely treatment of severe hypertension, and appropriate use of magnesium sulfate. However, postpartum blood pressure monitoring and counseling remained suboptimal, underscoring the need for continued audit cycles, staff sensitization, and strengthening of postnatal care pathways to improve long-term maternal outcomes in the Pakistani healthcare context.

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