

Research Article

Retinal Manifestations of Hypertensive Disorders in Pregnant Women: Insights from a Rural Antenatal Cohort

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ABSTRACT

Pregnancy-Induced Hypertension (PIH) poses serious risks to maternal and foetal health. This cross-sectional study evaluated retinal changes in 103 hypertensive pregnant women in a rural tertiary care setting. Fundus abnormalities were found in 37.9% of cases, with AV crossing changes and Grade 2 hypertensive retinopathy being most common. Significant associations were observed with blood pressure, gestational age, visual acuity, and occupational status. Fundoscopic screening can aid in early detection and management of systemic hypertension during pregnancy

Background: Pregnancy-Induced Hypertension (PIH) is a prevalent complication during pregnancy, contributing significantly to maternal and foetal morbidity and mortality. Ocular changes, particularly fundus findings, can serve as early indicators of systemic vascular compromise.

Introduction: This study explores the retinal manifestations of hypertensive disorders in pregnant women, with a focus on a rural antenatal cohort. Pregnancy-Induced Hypertension (PIH), including preeclampsia and eclampsia, remains a major contributor to maternal and fetal morbidity. Given the accessibility and non-invasive nature of fundus examination, this study evaluated ocular changes in 103 antenatal women with hypertension at PES Hospital using direct and indirect ophthalmoscopy. Fundus abnormalities were observed in 37.9% of cases, with AV crossing changes and Grade 2 hypertensive retinopathy being most common. Statistically significant associations were found between retinal findings and factors such as blood pressure, gestational age, gravida status, visual acuity, and occupation. The results emphasize the importance of integrating routine retinal screening into antenatal care, especially in resource-limited rural settings, to facilitate early detection and intervention for systemic hypertension and improve pregnancy outcomes.

Aim: To study the fundus changes in various hypertensive disorders during the antenatal period in a rural population.

Methods: A cross-sectional study was conducted on 103 antenatal women with hypertension at PES Hospital. Participants underwent visual acuity testing and fundus evaluation using direct and indirect ophthalmoscopy. Demographic, clinical, and fundoscopic data were collected and analysed using SPSS software.

Results: Fundus changes were present in 37.9% of participants. The most common abnormalities were AV crossing changes (23.3%), AV narrowing (6.8%), retinal hemorrhages (4.9%), and papilledema (2.9%). Grade 2 hypertensive retinopathy was the most frequent (61.5%). Significant associations were found between fundus changes and blood pressure levels, visual acuity, gestational age, and occupational status ($p < 0.05$).

Conclusion: Fundoscopic examination is a non-invasive, cost-effective tool that provides valuable insight into the systemic impact of hypertension in pregnancy. Routine retinal screening in antenatal care—especially in rural settings—can aid in early detection, timely intervention, and improved maternal and fetal outcomes.

INTRODUCTION

Pregnancy-Induced Hypertension (PIH) is one of the most common complications during pregnancy, associated with significant maternal and fetal morbidity and mortality. Preeclampsia and eclampsia are severe forms of PIH. Fundus examination can provide a non-invasive window into the vascular health

of pregnant women, particularly helpful in rural and resource-limited settings where early detection and timely intervention are critical.

MATERIALS AND METHODS

A cross-sectional study was conducted at PES Hospital from 2023 to 2024, involving 103

pregnant women with hypertension aged between 18 to 35 years.

Inclusion criteria: All antenatal women with hypertension willing to participate.

Exclusion Criteria: Preexisting diabetes, ocular pathologies, and postnatal women.

Each subject underwent history taking, visual acuity testing, and detailed fundus evaluation using direct and indirect ophthalmoscopy. Data was analyzed using SPSS Version 20.0, applying descriptive and inferential statistical tests.

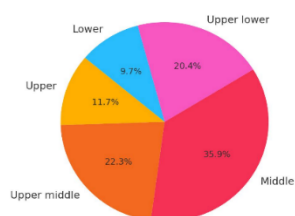
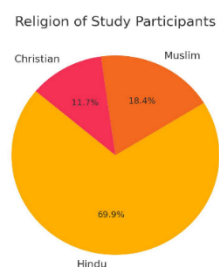
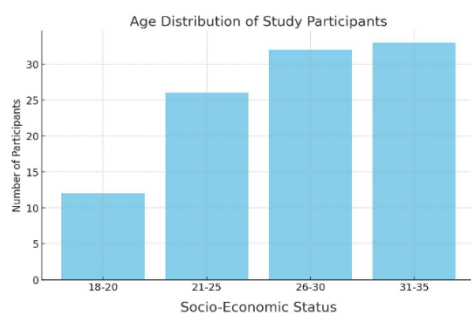
RESULTS

- Mean Age: 27.35 ± 5.27 years
- Fundus Changes Observed: 37.9%
- AV crossing changes: 23.3%

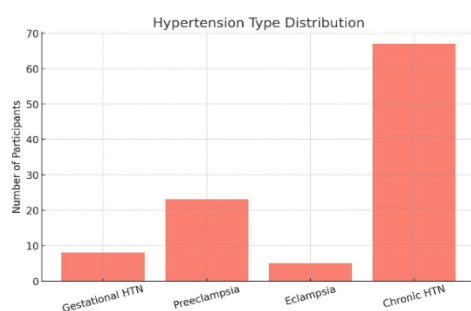
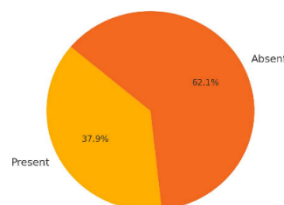
- AV narrowing: 6.8%
- Retinal hemorrhages: 4.9%
- Papilledema: 2.9%
- Hypertensive Retinopathy Grading (Among affected):
 - Grade 1: 17.9%
 - Grade 2: 61.5%
 - Grade 3: 12.8%
 - Grade 4: 7.6%

Statistical Significance: Fundus changes were significantly associated with:

- Blood pressure levels (SBP & DBP)
- Gestational age
- Gravida status
- Occupational status
- Visual acuity



Prevalence of Fundus Changes



DISCUSSION

This study highlights the clinical significance of fundoscopic evaluation in hypertensive pregnancies. Fundus changes were found in over one-third of participants, with AV changes being the most common. Higher grades of hypertensive retinopathy correlated with elevated blood pressure levels and poorer visual acuity. These findings underscore the

importance of regular retinal screening in antenatal care to detect and manage systemic hypertension early.

Comparative literature supports this—studies by Aggarwal et al., Bakhda et al., and Tadin et al. also identified fundus changes as important prognostic tools in hypertensive pregnancies.

CONCLUSION

Fundus examination is a valuable, non-invasive tool for evaluating vascular health in hypertensive pregnancies. Its integration into antenatal screening protocols, especially in rural healthcare systems, can significantly improve maternal and fetal outcomes through early detection and timely intervention.

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