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TERM PLACENTAL ABRUPTION RATES IN HYPERTENSIVE PREGNANCIES: A PROSPECTIVE EPIDEMIOLOGICAL STUDY

Shehla Parveen[*1], Shaista Hifaz Abro[2], Afshan Bhatti[3], Sajid Atif Aleem[4]

[*1,2,3]*Shaheed Mohtarma Benazir Bhutto Medical University, Larkana*
[4]*APPNA Institute of Public Health, Jinnah Sindh Medical University, Karachi*

[*1]shehlaabbasi86@gamil.com, [2]drstabro@yahoo.com, [3]drafshanb@gmail.com, [4]sajid.aleem@jsmu.edu.pk

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Corresponding Author: *

Abstract

Background

The early separation of the placenta from the uterine wall, or placental abruption results in a very serious complication that is associated with many risks for both mother and baby. The main factors responsible are hypertensive disorders, chronic hypertension and preeclampsia due to altered blood flow at the placenta level which has also injury oxidative because of vascular ischemia. Placental abruption was almost 4 times more likely in hypertensive than normotensive pregnancies. If it occurs at term (after 37 weeks), then induction is required and the mother can hemorrhage or fetal distress result. Either way, abruption has long been a central concern in the care of women with hypertensive pregnancies.

Methodology

This was a descriptive cross-sectional study, conducted among 154 hypertensive pregnant women at Shaikh Zayed Women Hospital SMBBMU Larkana. The non-probability consecutive sampling technique was used to recruit the women. Continuously monitor and record the blood pressure to ensure accurate and consistent measurements. Schedule ultrasound examinations for all identified cases of hypertension were done to assess the placental abruption based on including retroplacental hematoma, intraplacental anechoic areas, placental thickening over 5.5 cm, and intra-amniotic echoes. Data were analyzed using SPSS ver. 26 for Windows (IBM Corp.). Data will be entered and analyzed by SPSS version 26. Descriptive statistics will be calculated, and data will be analyzed and generated with 95% confidence interval.

Results

The mean ± SD of age of the participants was 30.56 ± 10.13 years, with a majority (55.8%) in the age range of 18-30 years, while 44.2% were older than 30 years. The mean diastolic blood pressure (DBP) was 90.91 ± 4.69 mmHg, with 54.5% having DBP between 80-90 mmHg and 45.5% over 90 mmHg. The placental abruption was found to be in 29 (18.8%) women. Systolic and diastolic blood pressures were slightly higher in the abruption group (137.24 ± 10.31 mmHg SBP and 91.55 ± 4.45 mmHg DBP) compared to those without abruption (136.68 ± 9.48 mmHg SBP and 90.76 ± 4.75 mmHg DBP) with (p=0.778 for SBP and p=0.415 for DBP).

Conclusion

This study found insignificant associations between term placental abruption rates in hypertensive pregnancies and factors like age, BMI, gestational age, or blood pressure. Although abruption was slightly more common in patients with elevated systolic and diastolic pressures, these differences were statistically insignificant, underscoring the need for further research to validate these findings.

INTRODUCTION

Placental abruption is a potentially serious problem in obstetrics that occurs when the placenta separates from the uterine wall before the fetus is delivered. When this happens at full term, which is usually defined as 37 weeks of gestation or later, the medical situation gets more complicated, especially when there is high blood pressure [1]. Hypertensive diseases during pregnancy, including prenatal hypertension and preeclampsia, greatly increase the likelihood and seriousness of placental abruption in the latter stages of pregnancy [2].

Placental abruption can manifest through abrupt and intense abdominal pain, sensitivity in the uterus, vaginal bleeding, and occasionally, indications of fetal distress [3,4].

Female with hypertensive disease (gestational hypertension and preeclampsia) are more likely to have an abruption placenta [5]. The exact pathogenesis of placental abruption related to hypertensive disorders is still not clearly understood. However, it is assumed that in the case of hypertension, impeded blood flow by this to placenta might also credit, implement such induction. Hypertensive disorders present with increased blood pressure, protein in the urine (being impaired among cases of preeclampsia) and other signs such as headaches or abnormal vision [6].

Placental abruption is a major problem to both the mother and baby [7,8]. Maternal problems may encompass bleeding, disseminated intravascular coagulation (DIC), and organ failure [9]. The potential issues for the fetus might vary from premature delivery to underweight at birth, and in more serious instances, fetal discomfort or fetal death [10].

Pregnant women with high blood pressure, especially those already suffering from hypertensive disorders associated with pregnancy require close surveillance in order to detect signs of potential problems such as placenta abruption. The majority of cases diagnosed with full-term placental abruption are managed by immediate delivery. Some parameters, such as the degree of abruption or its clinical circumstances and other clinically important factors defined whether obstetricians opted for vaginal delivery in absence versus cesarean birth over presence [11-13].

The current study was designed to investigate the placental abruption at term in relation with hypertensive disorders. Gestational hypertension and preeclampsia increase the risk of adverse maternal as well as fetal outcome including placental abruption. This is important for risk stratification, targeted monitoring and also has implication in the epidemiology of obstetric complications as well to facilitate clinician awareness-based preventive measures by determining burden of disease.

METHODOLOGY

This cross-sectional study was done at the Department of Obstetrics & Gynaecology, Shaikh Zayed Women Hospital, SMBBMU Larkana for evaluation of prevalence rate of placental abruption in term hypertensive mothers. The study was conducted on 154 participants, who were approached through a non-probability consecutive sampling technique. The total of 154 women were included in the study who were selected through non-probability consecutive sampling technique. Women with systolic blood pressure (SBP) ≥140 mm Hg or diastolic blood pressure (DBP) ≥90 mm Hg, confirmed on two occasions at least four hours apart after 20 weeks of gestation, or as a previous diagnosis of chronic hypertension before pregnancy or during the first 20 weeks were considered as hypertension. Placental abruption was evaluated through ultrasound findings, including retroplacental hematoma, intraplacental anechoic areas, placental thickening over 5.5 cm, and intra-amniotic echoes. Women of age group 18–40 years, gestational age > 20 weeks, meeting the criteria for hypertension, either singleton or multiple pregnancies confirmed by ultrasonography, both booked and unbooked, women with any parity or gravida participated in the study. Women having normal blood pressure, gestational diabetes (glucose tolerance test >4.8 mmol/L), women with history of trauma, genital tumors or infections, vasa previa, vulvovaginal varicosity or those who were unable to provide informed consent eliminated from the study. Eligible patients were included from the outpatient department, and written informed consent was collected to ensure confidentiality and voluntary

participation. Demographic data, which include age, parity, and gravidity, along with clinical history, were recorded for each participant. Baseline assessments for blood samples, liver function tests (LFT), complete blood count and urine analysis were done to rule out active medical comorbidities related hypertension. The blood pressure of all included patients was continuously monitored and recorded to validate accuracy. Ultrasound examinations were performed to all the women with the standardized protocols for placental assessment in a comfortable position of each patient and transducer covered by an ultrasonic gel to obtain the images optimizing visualization of uterus with its supplementary structures, including clearly assessable places where placentas have been located. Ultrasound image acquisition was performed by the same sonographer using uniform ultrasound equipment in all subjects, and on arrival blood pressure was directly measured, at rest under supervision of the principal investigator. To keep the data confidential, data was recorded directly to a computerized database, with descriptive statistics (prevalence rate and exact 95% CI) for baseline characteristics. SPSS v. 26 was employed for data analysis.

RESULTS

Table I presents the baseline characteristics of the study participants. The mean ± SD of age of the participants was 30.56 ± 10.13 years, with a majority (55.8%) in the age range of 18-30 years, while 44.2% were older than 30 years. The study participants' mean body mass index was 25.84 ± 3.55 kg/m^2, with 63% of patients having a body mass index between 20 kg/m^2 and 26 kg/m^2 and 37% more than 26 kg/m^2. The mean gestational age was 37.01 ± 4.51 weeks, with 68.8% of patients beyond 37 weeks gestation and 31.2% between 24-37 weeks. Blood pressure measurements indicated that the mean systolic blood pressure was 136.79±9.61 mmHg and mean diastolic blood pressure was 90.91±4.69 mmHg, with 74% had SBP within 125-140 mmHg and 26% exceeding 140 mmHg while 54.5% had DBP between 80-90 mmHg and 45.5% over 90 mmHg. 52.6% of participants have 0-2 children and 47.4% with more than 2 with mean parity of 2.27 ± 1.58. Bleeding was recorded in 42.2%, and lower abdominal tenderness in 43.2%. Booking status showed that 69.5% were booked while 30.5% were unbooked. Mode of delivery showed that 29.9% had vaginal deliveries, while 70.1% underwent cesarean sections.

Table II shows the participants' characteristics with and without placental abruption. Out of 154 participants, placental abruption was recorded in 29 (18.8%) while 125 (81.2%) did not. For those with placental abruption mean age was 30.24 ± 10.31 years, while it was 30.64 ± 10.13 years for those without, reported no significant difference (p=0.849). In both groups, the mean BMI was found similar, 25.56 ± 2.88 kg/m^2 for abruption and 25.91 ± 3.70 kg/m^2 for those without abruption (p=0.629). Gestational age recorded a non-significant difference, with a mean of 38.10 ± 4.18 weeks and 36.75 ± 4.56 weeks in the abruption and non-abruption group (p=0.147). Systolic and diastolic blood pressures were slightly higher in the abruption group (137.24 ± 10.31 mmHg SBP and 91.55 ± 4.45 mmHg DBP) compared to those without abruption (136.68 ± 9.48 mmHg SBP and 90.76 ± 4.75 mmHg DBP), but these differences were not statistically significant (p=0.778 for SBP and p=0.415 for DBP).

Bleeding was more frequent in the abruption group (7.8%) compared to the non-abruption group (34.4%), though this difference was insignificant (p=0.470). Lower abdominal tenderness was noted in 9.7% of patients with abruption and 33.8% without abruption (p=0.322). Booking status revealed insignificant association, with 13.0% of patients with abruption being booked and 8.8% unbooked (p=0.947). For mode of delivery, 3.9% of those with abruption delivered vaginally and 14.9% had cesarean sections, as compared to 26.0% vaginal and 55.2% cesarean sections in those without abruption (p=0.231). Overall, no statistically significant differences were recorded between the groups across any variables in this analysis.

DISCUSSION

This study assessed the prevalence and clinical characteristics of placental abruption in hypertensive pregnancies, a topic of considerable importance due to the high risk of adverse outcomes for both mother & fetus. Preeclampsia and gestational hypertension which are the hypertensive disorders, are primary contributors to placental abruption, characterized by

vaginal bleeding and abdominal pain, and fetal distress in severe cases. 154 hypertensive pregnant women were assessed in this study by using ultrasound criteria, including placental thickening over 5.5 cm and retroplacental hematoma. The clinical parameters were precisely monitored, with blood pressure assessments to ensure consistent and reliable diagnostic criteria, to confirm 18.8% of hypertensive pregnancies encountered abruption. This finding is aligned closely with earlier studies by Khan et al. and Sass et al. who indicated focused hypertension and comparable frequency rates as a prominent risk factor for placental abruption [14,15]. Even though differences between women with and without abruption were recorded in systolic and diastolic blood pressures, which were statistically not significant, recommending hypertension being robust risk factor, may interact with further strategies like inflammatory or vascular pathways to precipitate abruption. These findings are aligned with research undertaken by Ananth et al. and Parker et al. who noted that vascular insufficiency, often exacerbated by hypertension, is important to abruption pathophysiology [16,17].

An important strength of this study is its cross-sectional, prospective design, making it possible for continuous measurement of blood pressure and ultrasound verification of abruption, thereby increasing the study's reliability against retrospective analyses, which are vulnerable to recall bias. Additionally, the use of specified diagnostic criteria allows an assessment that is uniform in determining abruption, limiting subjective bias on diagnosis and supporting similar criteria noted by larger cohort studies by Ruiter et al. and Pariente et al. [18,19]. However, the study limitations were its cross-sectional design, which, does not establish causality, while effective for assessing associations. Parker et al. which conducted longitudinal studies, favors a more direct cause-related association by tracing the occurrence of abruption recurrently over time [17]. Furthermore, by excluding cases with trauma and gestational diabetes these findings may not be generalized as these conditions often co-exist with hypertensive disorders and thus might increase the risk of placental abruption. Pariente et al. and Schur et al. highlight the aggregate impact of multiple comorbidities on abruption risk, and therefore suggest wider inclusion criteria in further studies [19, 20]. To the best of our knowledge, this study provides valuable information to comprehend the clinical implications and outcomes quality for placental abruption in hypertensive pregnancies; it confirms that adequate prenatal care should be performed on regular basis in high-risk populations.

CONCLUSION

This study found insignificant associations between term placental abruption rates in hypertensive pregnancies and factors like age, BMI, gestational age, or blood pressure. Although abruption was slightly more common in patients with elevated systolic and diastolic pressures, these differences were statistically insignificant, underscoring the need for further research to validate these findings.

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