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ORIGINAL ARTICLE

Prevalence and Associated Risk Factors of Hypertension among Pregnant Women in Rural Areas of South Punjab

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ABSTRACT

Background: Hypertension is a frequently encountered medical condition that can arise during pregnancies, affecting a significant proportion of expectant mothers, ranging from 4% to 9.5% of all pregnancies.

Objective: To calculate the prevalence of hypertension in pregnant women in rural areas of South Punjab, Pakistan, and identify the obstetric risk factors linked with hypertension in them.

Settings and Design: A Cohort Study was conducted at Multan Medical and Dental College, Multan.

Materials and Methods: Pregnant women in two health block villages were the subjects of the current study, which ran from May 2020 to April 2021. A sample size of 765 was determined. Pregnant women predicted to be in each block were recorded, and proportionate allocation was used to determine which pregnant women from each block and sub-center would be included. The villages in each sub-center were surveyed house to home to gather data. The data was gathered using a proforma that had been previously created and tested. Data was analyzed using Results analyzed from SPSS 24.

Results: 765 pregnant women in all gave their permission to participate. Pregnancy-related hypertension was 10.2% prevalent. The following obstetric characteristics were statistically significant risk factors for hypertension in pregnancy: multigravidity, multiparity, gestational age greater than 24 weeks, history of hypertension in a previous pregnancy, and history of stillbirth. Maternal hypertension was found to be independently predicted by gestational age longer than 24 weeks, according to a logistic regression study.

Conclusion: Understanding the obstetric risk factors associated with pregnancy-related hypertension may help preventative measures for this population.

Keywords: Pregnant women, hypertension, rural areas.

INTRODUCTION

Preexisting (or chronic) hypertension, prenatal hypertension, preeclampsia, and eclampsia are all considered hypertensive diseases of pregnancy and are thought to affect 5% to 10% of women in the reproductive age range(Umesawa M, 2017). Due to its effects on obstetric and fetal outcomes, pregnancy-related hypertension poses a significant barrier to antenatal care. Throughout pregnancy and the postpartum period, up to 15% of difficulties are related to hypertension(Organisation, 2020). These cause 30,000 maternal fatalities worldwide each year, accounting for 10% to 15% of maternal deaths in low- and middle-income nations. They are a significant contributor to maternal and perinatal morbidity and mortality(Wu P, 2017).According to a multicenter research conducted in four developing nations like India, Nigeria, Pakistan, and Mozambique, one in ten pregnant women developed hypertension(Magee LA, 2019).

According to studies, there is a significant independent risk factor for the development of gestational diabetes mellitus that is pregnancy-induced hypertension(Aburezq M, 2020). Women who have elevated blood pressure during pregnancy are apparently at an increased risk of developing cardiovascular diseases (CVD) later in life(McDonald SD, 2008). The increase in cardiovascular disease (CVD) can be linked to the prevalence of common risk factors like type 2 diabetes, chronic hypertension, and elevated blood lipids. These risk factors are often associated with the rapid urbanization and changing lifestyles(Stuart JJ, 2018). There has been a noticeable increase in the occurrence of hypertension during pregnancy, which has been linked to a higher likelihood of fetal growth retardation and negative birth outcomes(Bakker R, 2011). Research conducted in India indicates that high blood pressure during pregnancy could be a significant factor in approximately 33% of maternal fatalities(Doke G, 2019). Monitoring blood pressure during pregnancy is a standard part of antenatal care. However, it is crucial to gain a deeper understanding of the prevalence of hypertension during pregnancy and the factors that contribute to its associated risks.Since primary care doctors are frequently the initial point of contact, it is crucial that they understand the risks associated with hypertension in pregnancy. Finding modifiable risk factors would be essential for the condition's primary prevention as well as for preventing unfavorable outcomes for the mother and fetus

With this context in mind, the current study intends to evaluate the prevalence of hypertension during pregnancy and the risk factors linked to it among prenatal patients receiving care at Multan Medical and Dental College, Multan, Pakistan.

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MATERIALS AND METHODS

Study Design: This research is a component of a cohort study aimed at evaluating the impact on the development of the fetus of maternal cortisol and psychological distress exposure.

Sample Selection: Participants met the following criteria:

(i) were between the ages of 14 and 42
(ii) had a gestational age of less than or equal to 24 weeks; and
(iii) had no known obstetric complications.

The study recruited pregnant women who volunteered to participate and met the inclusion criteria. Over the course of 15 months, the data for 765 pregnant women who had finished their baseline visit were examined.

Data collection and measurements: Written informed consent was obtained after the participants were informed about the purpose of the study. Comprehensive data on sociodemographic characteristics, social support, marital strife, domestic violence, medical history, obstetric history, and depression and anxiety indicators were all collected using the questionnaire. Pregnant women were screened for depression using the Edinburg Postnatal Depression Scale. It's a popular 10-item self-report measure for prenatal depression screening (Cox JL, 1987). Using the 10-item Pregnancy-Related Anxiety (PRA) Scale, anxiety during pregnancy was screened (Huizink AC, 2016). The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure social support. With scores ranging from 1 to 7, it

contains 12 items to gauge respondents' subjective assessments of the assistance they receive from friends, family, and "significant others." (Zimet GD, 1988). The socioeconomic status was assessed using the updated Kuppuswamy Scale (Shaikh Z, 2017). Using a standardized calibrated weighing scale for weight and a stadiometer for height, the anthropometric measures were taken at the end of the interview. The results were used to calculate the body mass index (BMI), which is calculated by dividing the weight in kilograms by the height in meters square (kg/m2).

Statistical Analysis: The data were exported to SPSS version 25. The exposure factors were included and classified based on the type of data. (i) Sociodemographic information, including age, occupation, socioeconomic status, religion, and level of education. (ii) Psychosocial factors: depression, anxiety, unintended pregnancy, marital problems, social support, and domestic violence. (iii) Medical and obstetric variables: body mass index, history of hypertension, and parity. Since only six women reported using tobacco, it was excluded from the analysis.

The study population's sociodemographic characteristics were presented through the use of descriptive statistics. The relationship between the independent and dependent variables was investigated using bivariate analysis, which produced a crude odds ratio with a 95% confidence interval. After the variables were dichotomized, the ones that the bivariate analysis revealed to be linked at a significant level (P <0.2) were added to a multivariate logistic regression model in order to compute the adjusted odds ratio and account for confounding. In the multivariate analysis, variables that had a P value of less than 0.05 were deemed significant in the research.

RESULTS

The Scio-Demographic Attributes of the Research Subjects: The study population had a mean age of 22.6 ± 4.44 years and a mean gestational age of 14.7 ± 4.2 weeks. Table 1 displays the sociodemographic features. More than half of the study participants were parous and of the Islamic faith, with the majority (88.8%) being under the age of 26. Over one-third of the respondents had completed high school education, and about 90% of them were stay-at-home moms. A significant proportion of them (43.9%) belonged to the upper lower class, and over 50% received strong social support from friends, family, and other important people.

Prevalence of Hypertension: 13.9% of the 765 participants who underwent examination had hypertension.

Hypertension Association with Socio-Demographic Variables: Among the sociodemographic factors, women above the age of 26 were shown to have a 1.7-fold increased risk of hypertension during pregnancy. This result was noteworthy when analyzed bivariately, but not when confounders were taken into account. When compared to homemakers, women who worked outside the home had a twofold higher risk of hypertension; multivariate analysis showed a significant increase in this risk (COR = 2.002; 95% CI: 1.03–2.30, AOR = 1.481; 95% CI: 0.97–2.24).

Association of Hypertension with Psychosocial Variables: Women who had moderate to low social support had 1.3 times greater risks of hypertension; however, this difference was only significant on bivariate analysis. It was discovered that anxiety related to pregnancy was a positive predictor of hypertension (AOR = 1.481; 95% CI: 0.97–2.24) and COR = 1.519; 95% CI: 1.01–2.28). Although the risk of hypertension was 1.2 times higher in depressed women, this difference was not statistically significant.

Association of Hypertension with physiologic Parameters: Although there was no statistically significant correlation found between gravidity, a history of hypertension, and hypertension in the current pregnancy, it was found that pregnant women who were obese had twice the likelihood of having hypertension compared to those who were not obese, with an AOR of 2.036 (95% CI 1.328–3.122).

Table 1: Socio-demographic characteristics of the study participants (n=765)

Variable	Frequency (n)	Percentage
Age Group		
≤ 28 years	695	88.5
29 years	88	11.2
Religion		
Hinduism	364	46.7
Christianity	20	2.1
Islam	440	55.9
Education		
Illiterate	36	4.5
Primary School	17	2.1
Middle School	175	20.3
High School	306	35.5
PUC or diploma	145	18.2
Graduate	72	9.6
Postgraduate	8	1.0
Occupation		
Housewife	703	90.2
Unskilled Worker	24	3.1
Semi-Skilled Worker	20	3.1
Skilled Worker	2	0.2
Clerical or Farmer	4	0.4
Semi Professional	8	0.9
Professional	3	0.5
Socio economic Status		
Upper Class	4	0.4
Upper Middle Class	130	17.0
Social Support		
Low	102	12.9
Moderate	234	29.5
High	433	58.9
Evidence of Domestic Violence		
No	699	97.0
Yes	15	3.0
Marital Discord		
No	398	49.5
Yes	350	45.9
Body Mass Index		
Underweight	120	13.5
Overweight and obese	254	25.8
Parity		
Nonparous	345	45.4
Parous	413	52.9

DISCUSSION

Using the 2017 guidelines from the American College of Cardiology/American Heart Association, the current study looked at the prevalence of hypertension in pregnancy and the factors that are linked to it. In the current study, the prevalence of hypertension was found to be 13.9%. This coincidentally matches exactly with the 13.9% observed rate reported by Ganguly and Begum in a hospital-based study conducted in Dhaka, Bangladesh (Ganguly S, 2007). There seems to be a notable regional disparity in the prevalence of hypertension across the various Indian states. Our study's prevalence is marginally lower than the 15.5% stated prevalence rate from a hospital-based study carried out in Kolkata (BS., 2004), The prevalence discovered in our study is considerably greater than that obtained from other comparable settings: 7.49% in Indore, 5.38% in Varanasi, and 10.4% in Salem (Sengodan S, 2020). This may be related to the fact that other research, which employed higher cut off values of BP ≥140/90 mm Hg, classified hypertension using the JNC VII report. Additionally, lower prevalence figures have been found in community-based investigations; rates of 5.8% and 6.9%, respectively, have been reported in rural Punjab and Haryana (Kuldip R, 2018). The current study's enlarged definition of hypertension may make it easier to identify more women who would benefit from prompt treatment.

Women above the age of 28 had increased risks of hypertension, although these differences were not statistically significant. Growing maternal age has been linked to hypertension during pregnancy. This could be explained by aging-related high

levels of oxidative stress and low amounts of nitric oxide, which have a negative impact on endothelial relaxation (Taddei S, 2006).

Due to its association with early marriage and care-seeking behavior, illiteracy has been reported to be a significant risk factor for hypertension during pregnancy; however, this observation was not made in the current investigation. It was shown that women who worked outside the home had a higher chance of developing hypertension. While some studies indicate that the risk is higher among homemakers, other studies have found a similar association (Tebeu PM, 2011). To explain these variations, more research would be needed as they could be influenced by the type and length of the labor, whether it is done outside or at home.

We were unable to find any evidence of a higher risk associated with psychological factors such as marital abuse, unwanted pregnancies, and reduced social support. On the other hand, worry associated to pregnancy seemed to be a favorable indicator of hypertension. One theory that makes sense is that stress during pregnancy is often linked to hypothalamo pituitary adrenal (HPA) axis dysregulation, which raises endogenous cortisol levels and leads to endothelial dysfunction (Vianna P, 2011). In a similar vein, depressive pregnant women seemed to have an increased risk of hypertension, however this was not statistically significant. In their investigation, Thombre et al. confirmed that, even after controlling for confounding variables, anxiety associated to pregnancy raised the incidence of hypertension by 1.2 times (Thombre MK, 2015). Despite the fact that primi parity is thought to be a risk factor for gestational hypertension, multivariate analysis did not reveal any such link. Numerous physiologic and immunologic mechanisms have been implicated in the relationship between primi parity and hypertension (Mustafa R, 2012). Even after controlling for confounders, pregnant women who were fat seemed to have a significantly higher risk of hypertension than pregnant women who were not obese. This risk looked to be more than twice as high. This is equivalent to findings from other research projects conducted in various nations (Wagata M, 2020).

The hyperinsulinemia brought on by a high body mass index, which results in endothelial dysfunction, is the pathophysiologic process that explains the connection between obesity and hypertension. High levels of triglycerides and free fatty acids, which are linked to obesity, are also said to raise the risk of pre-eclampsia (Hubel CA, 1996).

A few modifiable risk factors for hypertension during pregnancy, such as obesity, have been identified by this investigation and are consistent with findings from previous comparable study settings. For respondents who were obese and had an outside job, the adjusted odds ratio was noticeably greater. Additional variables that seemed to raise the risk were older mothers, lower socioeconomic position, anxiety related to pregnancy, prenatal depression, and nulliparity. Pregnancy-related risk factor profiling is crucial for identifying women who may be at high risk of developing hypertension problems. Numerous of these variables might be taken care of early in pregnancy, which would greatly lower the chance of future cardiovascular problems for women as well as prevent morbid obstetric and fetal outcomes.

CONCLUSION

According to the current study, pregnancy-related hypertension is becoming a significant clinical and public health problem since it may have detrimental short- and long-term effects on the health of the mother and her unborn child. In the current investigation, a significant percentage of pregnant women—more than one-tenth—were found to have hypertension. In the early stages of prenatal care, primary care physicians are essential in the early identification and management of hypertension.

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