



RISK FACTORS OF HYPERTENSIVE DISORDERS OF PREGNANCY IN A TERTIARY CARE HOSPITAL.

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Abstract

Background: Pregnancy-related hypertension is the most prevalent medical condition and a significant contributor to maternal morbidity and death. But its scope and danger aspects haven't been sufficiently evaluated yet.

Methods: To determine the risk factors connected to hypertensive disorders of pregnancy, facility-based retrospective case-control research was carried out at multiple centers including DHQ Battagram KPK and United Medical and Dental Collage Karachi, Pakistan in the duration from September, 2023 to February, 2024, The multivariate logistic regression model considered the addition of bivariate logistic regression. Lastly, multivariate analysis was performed to determine the risk variables for pregnancy-related hypertension diseases.

Results: Of the 4965 women whose delivery data were available during the study period, 263 (5.29%) had HDP. Out of 150 women, 78.90% had either pre-eclampsia or eclampsia. Gestational hypertension accounted for 17.70% of the cases, superimposed hypertension for 1.10 percent, and chronic hypertension for 4.50%. The multivariate analysis revealed that the age category of 35 years and above (AOR: 2.145 (1.254, 4.213), 95% CI: 8.254 (1.475, 8.254)), rural dwellers (AOR: 2.125 (1.457, 2.784), 95% CI: 1.785 (1.854, 2.458), prim gravida pregnancies (AOR: 3.245 (3.156, 5.214, 95% CI: 4.845 (2.547, 4.040)), null parity (AOR: 4.145 (2.458, 9.025), 95% CI: 2.36, 8.03), women who had positive history of abortion (AOR: 5.370 (1.458, 10.841, 95% CI: 7.125 (5.458, 20.458), Twin pregnancies (AOR: 7.547 (4.480, 8.458, 95% CI: 3.125 (5.784, 6.125)), ANC follow up (AOR: 5.125 (3.875, 6.458 95% CI: 6.125 (3.458, 5.235), positive pre-existing history of hypertension (AOR: 6.845 (5.235, 11.254, 95% CI: 4.285 (4.215, 12.214), family history of hypertension (AOR: 6.254 (5.987, 7.987), 95% CI 5.258 (5.236, 10.146)), History of diabetes mellitus (AOR: 5.325 (5.214, 9.254), 95% CI: 8.456 (6.458, 8.235) were risk factors for hypertension disorders during pregnancy.

Conclusion: Pregnant women with hypertension are more likely to experience adverse pregnancy outcomes than pregnant women with normal blood pressure. Risk factors for developing hypertensive disorders during pregnancy include being elderly, residing in a rural area, single, nulliparous, having a positive history of abortions, having twin pregnancies, not receiving antenatal

care, having positive blood pressure, having a positive family history of hypertension, and having positive diabetes mellitus.

Keywords: Risk factors, Hypertension disorders, Pregnancy

Introduction:

The clinical term for elevated blood pressure is hypertension (Bazzano et al., 2016; Stuart et al., 2018). "Systolic blood pressure that is higher than or equal to 140 mmHg and diastolic blood pressure greater than or equivalent to 90 mmHg, which is usually established within four hours of separate measurement" is the definition of hypertension in pregnancy (Bazzano et al., 2016). A range of disorders, including pre-existing hypertension, gestational hypertension, preeclampsia/eclampsia, and superimposed hypertension, are included under the term hypertension disorder of pregnancy.

These diseases might cause serious problems that could endanger mothers, fetuses, or newborns, or they can cause a little elevation in blood pressure at term without any further symptoms or indications (Shen et al., 2017). Every year, a considerable number of women worldwide pass away from pregnancy-related causes; over half of these deaths take place in sub-Saharan Africa (Yildirim et al., 2011). Pregnancy-related hypertensive diseases, such as pregnancy-induced hypertension, are linked to about 12% of maternal mortality (Bazzano et al., 2016; Yıldırım et al., 2011). Complications from hypertension are, therefore, one of the major global public health concerns.

The total prevalence of hypertensive disorders of pregnancy was 8.5%, with severe preeclampsia and eclampsia accounting for 51.9 and 23.4%, respectively, according to hospital-based cross-sectional research carried out at Jimma University Specialized Hospital in Ethiopia (Wolde et al., 2011).

Also, the Debre Brehan Referral Hospital research revealed that 340 (3.9%) of the 8626 pregnant patients who received delivery services had hypertensive problems, with the percentage rising from 1.8% in 2011 to 5.7% in 2014 (Terefe et al., 2015)

Thus, this study must be carried out to identify the risk factors and associated issues for hypertensive mothers.

Methodology:

Retrospective research at multiple centers including DHQ Battagram KPK and United Medical and Dental Collage Karachi, Pakistan aimed at discovering risk factors and their prevalence for hypertensive disorders of pregnancy. All moms who delivered at Jinnah Hospital Lahore's gynecology department were the source population.

The study population was divided into two groups: cases and controls. Women who had hypertension disorders while pregnant and gave birth at Jinnah Hospital were classified as cases, while women who did not have hypertensive disorders were classified as controls.

First, data of 4965 pregnant women who gave birth were divided into those with and without hypertension. The research study included a total of 150 cases and 300 controls, based on 1:2 ratios of samples of cases and controls, respectively.

Using an established and organized checklist, data was gathered from the evaluation of records. Supervisors and data collectors received the same training. Pregnancy-related hypertension records were used as a case group, while the remaining databases served as the control group. As a result, data exhibiting any of the four kinds of HDP (gestational hypertension, chronic hypertension, preeclampsia/eclampsia, or superimposed hypertension) were initially selected as the case group. A random control group was then chosen from the remaining registries.

For gestational hypertension, the prerequisites included an increase in blood pressure; for other forms of hypertensive diseases, the criteria included blood pressure, proteinuria, and other laboratory tests.

Results

263 (5.29%) of the 4965 women with delivery records during the research period had HDP. Three hundred controls and 150 cases, a total of 450 women, provided the study's final data set. The following table shows the demographic details of the study population.

Table 1: Demographic details of the study population

Variables	Case N=150 N,%	Control N=300 N,%	X 2	P-value
Age category				
< 25	65(43.3)	133(44.3)	17.24	----
25–29	35(23.33)	72(24)		
30–34	27(18)	51(17)		
> 34	23(15.3)	44(14.6)		
Mean (SD)	25.7	24.3		
Residence				
Urban	55(36.6)	112(37.3)	5.68	0.015
Rural	95(63.3)	188(62.6)		
Marital status				
Single/divorced	8(5.3)	6(2)	4.21	0.03
Married	142(94.7)	294(98)		
Pregnancy plan				
Wanted	135(90)	288(96)	5.87	0.214
Unwanted	15(10)	12(4)		

The mean age of the patients was 25.7 (SD: ± 6.5) compared to 24.3 (SD: ± 4.8) for the controls. Table 2 shows that whilst 133(44.3%) of the controls and 65(43.3%) of the cases were younger than 25, 23(15.3%) of the cases and 44(14.6%) of the controls were older than 35 years

Table 2: Obstetrics history of cases and control

Variables	Case N=150 N,%	Control N=300 N,%	X 2	P-value
Current history of pregnancy: Gravida				
Prim Gravida	85(56.6)	88(29.4)	27.25	0.54
Multigravida	65(43.3)	212(70.6)		
Current pregnancy history: Parity				
Null parity	55(36.6)	45(15)	45.87	0.021
Parity > or = 1	95(63.4)	255(85)		
Current pregnancy history: Abortion				
No	125(83.3)	292(97.3)	54.23	0.004
Yes	25(16.7)	8(2.7)		
Multiplicity of pregnancy				
Single	136(90.6)	288(96)	14.21	0.014
Twin/Multiple	14(9.4)	12(4)		
ANC follow-up history				
No	117(78)	52(17.3)	21.25	0.544
Yes	33(22)	248(82.6)		

Prim gravida was detected in 85 (56.6%) of the case group and 88 (29.4%) of the control group, with 65 (43.3%) cases and 212 (70.6%) controls. Were from multigravida pregnancies (Table 3). In terms of parity, 55 patients (36.6%) and 45 controls (15%) were nulliparous, whereas 95 cases (63.4%) and 255 controls (85%) had parity greater than or equal to one. The parity disparity among the two groups was significant (P=0.021). The following figure shows the prevalence of hypertensive disorders among the cases.

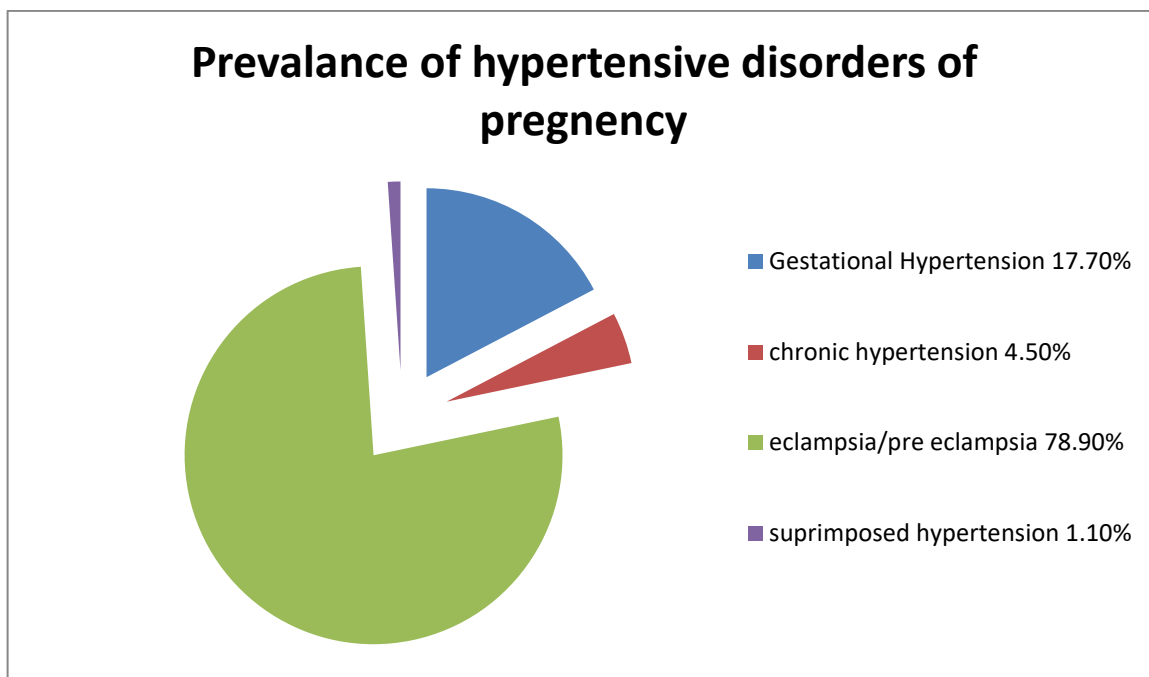


Table 3: Multivariate analysis of risk factors for the mother

Variables	Case N=150 N,%	Control N=300 N,(%)	COR (95%: CI)	AOR (95%:CI)
Age category				
< 25	65(43.3)	133(44.3)	.546(.578, 1.784)	.475(.458, 1.53)
25–29	35(23.33)	72(24)	1	1
30–34	27(18)	51(17)	1.351(.775, 2.356)	1.020(.513, 2.026)
> 34	23(15.3)	44(14.6)	8.254 (1.475, 8.254)	2.145 (1.254, 4.213)
Residence				
Urban	55(36.6)	112(37.3)	1	1
Rural	95(63.3)	188(62.6)	1.785 (1.854,2.458)	2.125 (1.457, 2.784)
Marital status				
Single/divorced	8(5.3)	6(2)	3.254 (4.258, 7.548)	1.254(.874, 3.458)
Married	142(94.7)	294(98)	1	1
Gravida				
Prim Gravida	85(56.6)	88(29.4)	4.845 (2.547, 4.040)	3.245 (3.156, 5.214)
Multigravida	65(43.3)	212(70.6)	1	1
Parity				
Null parity	55(36.6)	45(15)	7.458 (7.445, 11.254)	4.145 (2.458, 9.025)
Parity > or = 1	95(63.4)	255(85)	1	1
Abortion				
No	125(83.3)	292(97.3)	1	1
Yes	25(16.7)	8(2.7)	7.125 (5.458, 20.458)	5.370 (1.458, 10.841)
Multiplicity of pregnancy				
Single	136(90.6)	288(96)	1	1
Twin/Multiple	14(9.4)	12(4)	3.125 (5.784, 6.125)	7.547 (4.480, 8.458)

ANC follow-up history				
No	117(78)	52(17.3)	6.125 (3.458, 5.235)	5.125 (3.875, 6.458)
Yes	33(22)	248(82.6)	1	1
Pre-existing hypertension				
No	127(84.6)	287(95.6)	1	1
Yes	33(15.4)	13(4.4)	4.285 (4.215, 12.214)	6.845 (5.235, 11.254)
Family history of hypertension				
No	105(70)	285(95)	1	1
Yes	45(30)	15(5)	5.258 (5.236, 10.146)	6.254 (5.987,7.987)
History of diabetes mellitus				
Yes	8(5.4)	16(5.34)	8.456 (6.458, 8.235)	5.325 (5.214,9.254)
No	142(94.6)	284(94.66)	1	1

The multivariate analysis revealed that, the age category of 35 years and above (AOR: 2.145 (1.254, 4.213), 95% CI: 8.254 (1.475, 8.254)), rural dwellers (AOR: 2.125 (1.457, 2.784), 95% CI: 1.854,2.458), prim gravida pregnancies (AOR: 3.245 (3.156, 5.214, 95% CI: 4.845 (2.547, 4.040)), null parity (AOR: 4.145 (2.458, 9.025), 95% CI: 2.36, 8.03), women who had positive history of abortion (AOR: 5.370 (1.458, 10.841, 95% CI: 7.125 (5.458, 20.458)), Twin pregnancies (AOR: 7.547 (4.480, 8.458, 95% CI: 3.125 (5.784, 6.125)), ANC follow up (AOR: 5.125 (3.875, 6.458 95% CI: 6.125 (3.458, 5.235)), positive pre-existing history of hypertension (AOR: 6.845 (5.235, 11.254, 95% CI: 4.285 (4.215, 12.214)), family history of hypertension (AOR: 6.254 (5.987,7.987), 95% CI 5.258 (5.236, 10.146)), History of diabetes mellitus (AOR: 5.325 (5.214,9.254), 95% CI: 8.456 (6.458, 8.235) were risk factors for hypertension disorders during pregnancy (Table 4).

Table 4: difference in maternal outcomes among cases and control

Variables	Case N=150 N,%	Control N=300 N,%	X2	P-value
Onset of labor				
Spontaneous	74(49.3)	271(90.3)	21.25	0.02
Induced labor or c/s	76(50.7)	29(9.7)		
Maternal death				
Yes	10(6.7)	4(1.4)	9.25	0.158
No	140(93.3)	296(98.6)		
Abruption placenta				
Yes	8(5.4)	3(1)	11.25	0.00
No	142(94.6)	287(99)		
Preterm delivery				
Yes	69(46)	4(1.4)	25.85	0.021
No	81(54)	296(98.6)		

Regarding the onset of labor, induced labor or C/S 76(50.7) for cases and 29(9.7) controls. The difference in onset of labor between those with and without HDP groups was significant p=0.02. (Table 5)

Discussion

This study aimed to determine risk factors for hypertensive diseases during pregnancy at Jinnah Hospital Lahore. The study found that the prevalence of hypertension problems during pregnancy

was 5.29%, lower than previous studies done at Tikur Anbessa Hospital, Jimma University Specialized Hospital, and Debre Berhan Referral Hospital (Shen et al., 2017; Suleiman, 2014; Terefe et al., 2015; Wolde et al., 2011). This might be attributed to increased knowledge of maternal health risks among extension healthcare providers in the current study, compared to previous studies conducted in rural areas.

The study discovered that hypertension during pregnancy is more common in women over 35 years old compared to those between 25 and 29 years old. A healthcare facilities cross-sectional analysis in Dasse Referral Hospital (Wodajo, 2016) and Derashe, woreda (Ayele et al., 2016) in Ethiopia found a significant association between late age 30 years and age above 35 years with hypertensive disorders during pregnancy. The findings of the above research align with our study's results.

In this study, rural areas had twice as many HDP cases (63.3%) as urban areas. The study identified rural residential areas as a risk factor for HDP. This finding was identical to research done in Jimma Hospital on a similar topic. (Wolde et al., 2011)

The current study found that women who had prima Gravida pregnancies were more likely to suffer hypertension issues than their counterparts. HDP was shown to be more severe in prim Gravida pregnant moms in the case group compared to the control group. These findings are similar to the findings observed in previous research (Hinkosa et al., 2020); this might be a result of the psychological strain and physical discomfort that first-time pregnancies typically entail, which increases a woman's likelihood of developing HDP.

According to this study, women who had previously had abortions were less likely than those who had never had one to have hypertensive problems. For example, an Iranian investigation found a discernible correlation between abortion history and an increased risk of moderate preeclampsia (Sharami et al., 2017) added that there was no real difference in the frequency of preeclampsia between women who had previously given birth prematurely and those who had never experienced an abortion or term pregnancy (Hinkosa et al., 2020; Xiong et al., 2002)

According to this study, in comparison with singleton pregnancies, twin pregnancies had a risk of hypertension throughout pregnancy that was more than twice as high. This outcome is consistent with studies carried out in northeastern Ethiopia. (Wodajo, 2016) According to this study, prenatal neglect was more frequently linked to hypertension throughout pregnancy. Similar results were observed in Egypt (El-Moselhy et al., 2011), where women without ANC follow-up had a greater incidence of preeclampsia. This may be because women who underwent ANC follow-ups may have received preeclampsia prevention treatments from medical professionals during their follow-ups.

The current investigation found a substantial correlation between the onset of hypertension and a positive prior history of preeclampsia. Women with an adverse family history of hypertension were less likely than those with pre-existing hypertension to acquire hypertensive disorders. According to previous research, women who present with preeclampsia or eclampsia are at a higher risk of developing persistent hypertension over the long term (Mbouemboue et al., 2016). These findings are consistent with the current study. Furthermore, the research generally agrees that a prior history of preeclampsia has a significant impact on developing pre-eclampsia. (Duckitt and Harrington, 2005; El-Nakhal, 2015; Suleiman, 2014)

According to this study, hypertensive disorders of pregnancy were significantly correlated with a family history of hypertension. Compared to women with an adverse family history of hypertension, those with a positive family history of the condition were more likely to acquire hypertensive problems. Additional comparable research conducted in Ethiopia's Tigray area found that relatives with a history of chronic hypertension increased the likelihood of HDP. (Hinkosa et al., 2020; Larry et al., 2017; Shegaze et al., 2016; Yang et al., 2021). These results suggest that this disease may be caused by both maternal and fetal genetics. Therefore, it should be closely checked during pregnancy as well as in the postpartum phase for women carrying children and who have a family history of HDP. This study revealed that a significant risk factor associated with HDP is diabetes mellitus. Numerous studies have provided evidence that diabetes mellitus is an important risk factor for the onset of preeclampsia (Bryson et al., 2003; Dalmáz et al., 2011; Hu et al., 2015).

Maternal outcomes differed significantly between the study's cases and controls. Induced labor or cesarean sections (CS) were, therefore, much more common in points (76, or 50.7%) than in controls (29, or 9.7%). Additionally, information on the method of birth reveals that while spontaneous vaginal delivery was more frequent in controls than in cases, Cesarean sections were more common in patients. When comparing patients to authorities, the chances of abruption placenta were more than three times. According to reports, placental abruption is a typical problem for mothers who have hypertension during pregnancy.(Ye et al., 2014; Yücesoy et al., 2005)

We used secondary data, which may have been missing certain variables. Omitted variables included mother's height, weight, and socioeconomic details like her education degree and smoking status. Thus more vast research is needed in this regard.

Conclusions

When it comes to unfavorable pregnancy outcomes, women with hypertension while pregnant are more at risk than those with normal blood pressure pregnant females. Old age, living in a rural area, single status, nulliparity, positive history of abortion, twin pregnancies, absence of antenatal care, positive already present hypertension, positive family history of hypertension, and positive diabetes mellitus were found to be risk factors for acquiring hypertensive disorders during pregnancy.

Conflict of interest.

The writers state that they don't have any conflicting interests.

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