

Fetomaternal Outcome of Pregnancy among Women Suffering from Chronic Hypertension

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ABSTRACT

Objective: To observe the association of chronic hypertension in pregnant women on their health and fetal outcome.

Methodology: This cross-sectional study was carried out from September 2019 to September 2020 upon a sample of 183 consenting pregnant women (chosen via non-probability – consecutive sampling) aged 20 – 35 years admitted to the study setting via OPD and emergency at Gynae Unit IV, Liaquat University of Medical & Health Sciences, Jamshoro (LUMHS). The data obtained was recorded on structured questionnaire comprising of inquiries pertaining to basic biodata, sociodemographic details, inferences obtained from history, clinical examination, and blood pressure. Data obtained was analyzed using SPSS V. 21.0.

Results: The mean age of the women was 24 years \pm 3 SD. The mean gestational age was 38 weeks (\pm 1 SD). A majority of the participants hailed from an urban background and most presented as booked elective cases (normal delivery more often than cesarean delivery). Chronic hypertension (mean value 134/92) was present among 38.8% of the study participants. Poor maternal and fetal outcome were encountered among patients with chronic hypertension.

Conclusion: A heavy burden of chronic hypertension was unearthed by this study which consisted of around 2/5th of whole sample. Adverse maternal outcomes including postpartum hemorrhage, eclampsia & spontaneous abortion and fetal (low birth weight & neonatal deaths complications were strongly associated with chronic hypertension.

KEYWORDS: Chronic Hypertension, Feto-Maternal Outcome, Pregnancy, Hypertensive Disorders, & Complications.

INTRODUCTION

Hypertension during pregnancy manifests in many forms and elicits a wide array of risks to the fetal and maternal health.^{1,2} Apart from being detrimental to fetal health, pregnancy induced hypertension (PIH) takes an estimated toll of 287000 maternal deaths annually.

Key statistics (morbidity, mortality, and life-time risk) vary across different regions.^{3,4} Globally, nearly one-fifth of all maternal deaths may be attributed to PIH, with an estimated 62000 – 77000 deaths per year, making pregnancy induced hypertension a leading cause of maternal mortality and fetal wastage globally.^{5,6}

Chronic hypertension is estimated to exist in 3-5% of pregnancies and is increasingly more commonly encountered in medical emergency. Factors contributing to these are some risk factors, such as hypertension, obesity, and older age.^{7,8} The condition is more common in the presence of factors such as anti-phospholipid antibody syndrome, BMI >30, chronic hypertension, pre-gestational diabetes and prior pre-eclampsia.^{9,10} Thus once manifested, hypertensive disorders are attributed disrupt healthy fetal growth, contribute to prematurity, and add to the already high perinatal morbidity and mortality.¹¹ Most obstetricians alert patients regarding the danger and incumbent maternal mortality associated with chronic hypertension.¹² What must additionally be done however, is that information should be offered regarding the probable acute and chronic adverse out-

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comes in the fetus such as prematurity and neuro-developmental defects in the fetus of the hypertensive mothers.¹³ It is estimated that chronic hypertension is to blame in most cases of perinatal deaths most notably in under-developed countries and low socioeconomic population.¹⁴ According to the Pakistan National Health Survey, “the prevalence of hypertension in Pakistani adults is estimated to be 23% in urban and 18% in rural areas.¹⁵ The prevalence of hypertension in female gender is found to be 14.5%.¹⁶ The reported prevalence for chronic hypertension in pregnancy is 22%.¹⁷”

Though the adverse events (during pregnancy) pertaining to the health of the mother in chronic hypertension are studied by many and a high incidence of morbidity and mortality is established, in developing countries (in particular) and around the world (in general); little is known regarding the true perinatal outcome associated with chronic hypertension among mothers. There is thus a large research gap in this aspect that merits to be fulfilled and this research is a step in this very direction since it observes the effect of chronic hypertension in pregnant women on their health and fetal outcome. This study will represent evidence for healthcare providers and policy makers in devising more appropriate interventions in improving maternal and perinatal health among pregnant women with chronic hypertension and associated disorders especially in low resource settings. Moreover, the patients can be prospectively rationalized and managed early according to the findings of present study and share the results as far as chronic hypertension and fetomaternal outcome is concerned at various health care seminars.

METHODOLOGY

This cross-sectional study was conducted from September 2019 to September 2020 at Gynaecology Unit IV, Liaquat University of Medical & Health Sciences, Jamshoro. The study was approved by Research Ethics Committee of Liaquat University of Medical & Health Sciences, Jamshoro (Letter No. LUMHS/REC/-803; Dated: 26/08/2019). One hundred and eightythree pregnant women were chosen via non-probability – consecutive sampling. Sample size was calculated via WHO open epi sample size calculator by taking the estimated prevalence of preeclampsia as 22%. The women between 20-35 years of age, primigravida as well as multigravida with gestational age varying from conception till 40 weeks, were included in the study. Duration of gestation was assessed by inquiring about the history of last menstrual

period (LMP) and by dating scan. All these women regardless of emergency or elective admission were included. The women with chronic renal / hepatic disease and connective tissue disorders were excluded from the study along with those having gestational hypertension who remained normotensive from conception till 20th weeks of gestation and pregnant women not giving consent or not interested to participate in the study. The informed consent form was given to the participants. Study participants were included after explaining the purpose and objectives of the study to them, besides taking a written informed consent on a consent form and they were allowed to leave the study at any time. Moreover, the purpose of the study, its benefits and harms were explained to the study participants. The study participants were assured that all the information received would remain anonymous and the collected data would only be used for research purpose. Each participant was evaluated for maternal outcome which includes prolonged hospitalization and ICU admission, Fetal outcomes were low fetal weight, intrauterine growth restrictions (IUGR), prematurity, respiratory distress syndrome, meconium aspiration, intrauterine death, still birth, NICU admission, and neonatal death

Statistical Analysis: Data was analyzed using Microsoft Excel 2016 and SPSS v. 21.0. Qualitative data (residential status, booking status, type of delivery, maternal & fetal outcome, and complication) was expressed as number and percentage. Quantitative data (age of mother, gestational week, and parity) were expressed as mean & standard deviation ($X \pm SD$). Odds ratio was calculated for the maternal and fetal outcomes among patients with and without hypertension. P value ≤ 0.05 was considered statistically significant.

RESULTS

The mean age of the women was 24 years ± 3 SD. The mean gestational age was 38 ± 1 weeks). The table 1 offers interesting insight into the descriptive statistics (qualitative and quantitative). The majority of the sample is showcased to be comprised of young adults, residing in urban areas and presenting to the study setting for booked visits and eventual elective deliveries (normal delivery more often than cesarean delivery). Chronic hypertension was present among 38.8% of the study participants. Mean blood pressure was 134/92. Poor maternal and fetal outcome were encountered among patients with chronic hypertension as shown in table 2 and 3.

Table 1: Summary of the Descriptive Statistics (N=183)

Variable		N (%)
Age (Years)	Up to 25	87 (47.54%)
	26 to 30	56 (30.6%)
	31 to 35	40 (21.86%)
Residential Status	Urban	95 (51.9%)
	Rural	88 (48.1%)
Booking Status	Booked	134 (73.2%)
	Un-Booked	95 (26.8%)
Gestational Age (Weeks)	Up to 36	38 (20.76%)
	37	51 (27.87%)
	38	57 (31.15%)
	39	23 (12.57%)
	40	14 (7.65%)
Parity	0	61 (33.3%)
	1 to 3	75 (41%)
	Greater than 3	47 (25.7%)
Delivery	Emergency	30 (16.4%)
	Elective	93 (51.4%)
	Instrumental	60 (32.2%)
Hypertension	Present	71 (38.8%)
	Absent	112 (61.2%)

The maternal outcome was normal in a vast percentage of the cases with prolonged hospitalization being reported in less than 1/4th of the cases and need for intensive care necessitated in less than 1/10th of the cases (Table2).

Table 2: Maternal Complication & Hospital Stay in Pregnancy due to Chronic Hypertension (N=183)

	N (%)	
Maternal Complications	Eclampsia	19(10.4%)
	HELLP Syndrome	03 (1.6%)
	Disseminated Intravascular Coagulation	01 (0.6%)
	Pulmonary Edema	08 (4.4%)
	Acute Respiratory Distress Syndrome	12 (6.6%)
	Abortion	31 (17%)
	Abruptio Placentae	15 (8.2%)
	Post-Partum Hemorrhage	28(15.3%)
	Renal Dysfunction	03 (1.6%)
	Hospital Stay	Normal
Prolonged Hospitalization		44(24%)
Intensive Care Unit Care		13(7.1%)

The commonest adverse fetal outcome was reported to be low birth weight, followed by NICU admissions.

Neither of the remaining outcomes was prevalent in more than a 1/10th of the sample (Table 3).

Table3: Fetal Outcomes of Pregnancy in Chronic Hypertension

Outcome	N (%)
Intra Uterine Growth Restriction (IUGR)	07 (3.8%)
Prematurity Respiratory Distress Syndrome	04 (2.2%)
Meconium Aspiration	03 (1.6%)
NICU Admission	24 (13.1%)
Intra Uterine Death	15 (8.2%)
Still Birth	04 (2.2%)
Low Birth Weight	39 (21.3%)
Neonatal Death	05 (2.7%)

The maternal complications of chronic hypertension

Table 4: Maternal & Fetal Complications V/S Chronic Hypertension

Complications	Chronic Hypertension		OR	P values
	Present (71)	Absent (112)		
Maternal				
Eclampsia	19	0	-	< 0.05*
HELLP Syndrome	01	02	0.8	> 0.05
Disseminated Intravascular Coagulation	0	01	0	< 0.05*
Pulmonary Edema	05	03	2.8	> 0.05
Acute Respiratory Distress Syndrome	05	07	1.2	< 0.05*
Abortion	19	12	3.1	> 0.05
Abruptio Placentae	13	02	12.3	< 0.01*
Post-Partum Hemorrhage	23	05	10.3	< 0.01*
Fetal				
Intra Uterine Growth Restriction (IUGR)	05	02	4.2	> 0.05
Prematurity Respiratory Distress Syndrome	02	02	1.6	> 0.05
Meconium Aspiration	01	03	0.5	> 0.05
NICU Admission	14	10	2.5	> 0.05
Intra Uterine Death	09	06	2.6	> 0.05
Still Birth	01	0	0	< 0.05*
Low Birth Weight	28	11	6.0	< 0.05*
Neonatal Death	04	1	6.6	< 0.01*

with the highest and significant odds of manifesting among the hypertensive individuals were Eclampsia abruptio placentae which was followed by post-partum hemorrhage. Among the fetal outcomes, still birth, low

birth weight and neonatal death were noted with significant odd ratio (Table 4). The maternal complications of chronic hypertension with the highest and significant odds of manifesting among hypertensive individuals were Eclampsia abruptio placentae, followed by post-partum hemorrhage. Among the fetal outcomes, still birth, low birth weight and neonatal death were noted with significant odd ratio (Table 4)

DISCUSSION

One in every 5 people in the country (as per Pakistan National Health Survey), suffers from hypertension in most urban centers in Pakistan.¹⁵ Pregnant women exceed this ration (22% prevalence).¹⁷ Though the adverse events (during pregnancy) pertaining to the health of the mother and in chronic hypertension are studied worldwide; local literature has been scarce until this research. Thus, the findings presented are largely novel. The mean age of the women was 24 ± 3 SD years. This is synonymous with the norm in the local populace. The Pakistan Demographic Health Survey dictates that the mean age of marriage in the country for women is 21 years and the mean age at first child is only 22. Since this research included a large proportion of primigravida women, it is expected that the age of the women may be low and match the maternal age mentioned in the PDHS survey for first child. Hypertension in younger women is not commonly found and, in most instances, hypertension develops post-menopause.^{17,18} The mean gestational age of the women reporting to the study setting was 38 ± 1 SD weeks. Though, this may seem too early, but does not classify as pre-term (earlier than 37 weeks). It is well understood and much reported in literature that as compared to normal controls, women with hypertension are more likely to experience preterm deliveries and thus the result of this study is matching. It is, however, necessary to note that though the gestational period was shorter in the women in this research, it did not lead to any adverse events, and no undue risks were noted to the women. This is synonymous with the observations published by authors in the region and other developing countries where specialized healthcare centers catering to emergencies are scarce.^{19,20} Research on local populace by Shoaib Un Nisa et al²¹ revealed that the incidence of preterm birth rises with the severity of hypertensive conditions. The prevalence is 25% among patients with pre-eclampsia and rises to 66.7% in patients with eclampsia. Chronic hypertension was present among 38.8% of the study participants. As mentioned above, hypertension in certain populations in the country have been reported to be as high as 41%.

Hence our finding does not seem anything out of the ordinary for the local population. Nonetheless, this holds both similarities and contrast to the findings published by researchers from other parts of the world.^{22,23} Global epidemiological surveys have reported lowest prevalence of chronic hypertension in the Scandinavian countries and the highest in the united stated and western Europe. Though it is noteworthy that the western regions of the world are economically affluent and are a part of the developed world, the health scenarios are quite different. The difference may be due to certain confounders namely obesity, age and alcohol and smoking habits of the populace. Investigating the trends however was beyond the scope of this research.^{24,25} While discussing maternal outcome, it is important to note that due to specialized and expert help being available at most tertiary care hospitals, complications may not always translate into a poor maternal outcome. However, it was evident that women suffering from chronic hypertension encountered poor outcomes, i.e., prolonged hospitalization (34 v.s 10) and ICU admission (8 vs 5), more often.²⁶ Research supports this finding across the globe and regardless of the country's development status or the level of expert health and help being available. The maternal outcomes were poor across the board whenever systemic diseases such as chronic hypertension step into the equation. Though there is a need to stratify in this research to account for effect modifiers, published evidence suggests that even after making adjustments for confounders, the outcome is not much different and still statistically significant.^{27,28} Fetal outcome of the study sample was classified as IUGR (3.8%), Prematurity RDS (2.2%), Meconium Aspiration (1.6%), NICU admission (13.1%), IUD (8.2%), Still Birth (2.2%), LBW (21.3%) and Neonatal Death (2.7%); all notably severe and merit to be avoided. It was again revealed that women suffering from chronic hypertension encountered these poor neonatal outcomes more often than their normal counterparts. Low Birth Weight and Neonatal Death were highly statistically significant. Shoaib Un Nissa et al²¹ claimed the following outcomes, namely IUGR (10%), RDS (20%), Meconium Aspiration (28.5%), IUD (27.3%), LBW (30%), and neonatal death (100%). On the international front, the maternal complications revolve around 9.4% and the fetal complications are reported at around 1.3%.²⁹ This study is among the few attempts made at studying both, the maternal and fetal outcome and in conjunction with maternal complications among women with chronic hypertension. The statistics yielded are largely novel and offer a fresh insight into the matter. The results may help serve as the basis for future research. There are, however, some limitations of the study. First, the long-term

follow-up was not arranged. Additionally, focusing solely on women without other comorbidities, a rather limited clinical picture was obtained. Furthermore, there is dearth of published evidence-based literature with which this study could be compared again intensively, thus little is known regarding how this study's results fair against data of the local and global populace. Additionally, As the extent of this research was limited to just a single city, in future similar research may be carried out on a larger sample of participants reflecting on broader demographical characteristics and taking more potential correlates to further the investigation in this field.

Limitation: This was a single center research, based on a single center with limited follow-up time. Thus, the results have a limited generalizability and applicability. Additionally, the results generated are largely novel for this locality thus there is limited evidence with which it can be compared.

CONCLUSION

A heavy burden of chronic hypertension was unearthed by this study which consisted of around 2/5th of the whole sample. Adverse maternal (postpartum hemorrhage, eclampsia & spontaneous abortion) and fetal (low birth weight & neonatal deaths).

Recommendations: It is recommended that expert help must be sought from relevant experts (physicians) to manage hypertension to the best possible level during pregnancy to avoid any undue feto-maternal outcomes and to minimize the deleterious effects it casts. A rigorous oversight supported by relevant information generated from routine (relevant) lab investigations must be available to healthcare professionals to enable them to provide the best care. The right info-care must be provided to women so adherence to hypertensive medication must be firm.

Conflict of Interest: None

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Authors' Contribution:

Dr. Nayab Qasim	Concept, literature search, data collection, analysis, first draft write-up.
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Dr. Erum Memon	Study concept and design, analysis, final review, overall supervision.
Dr. Mala Jitendra Shahani	Data Collection Statistical analysis proved the manuscript.
Dr. Sumiyya Khalid	Concept, Data analysis & approved the manuscript.
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