

A PROSPECTIVE COMPARATIVE STUDY OF HYPERTENSION COMPLICATING PREGNANCY IN MULTIGRAVIDAE VERSUS PRIMIGRAVIDAE ADMITTED IN TERTIARY CARE HOSPITAL

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Abstract

Introduction: Approximately 5-10% of women develop hypertension during the course of their pregnancies. Hypertension in pregnancy produces several short and long term health consequences in the mother and fetus, including perinatal mortality. In short term, maternal outcomes in hypertension complicating pregnancy will be preterm labor, PPH, abruption placenta, HELLP syndrome, renal failure, cardiac failure, DIC and other complications and fetal outcomes in hypertension complicating pregnancy will be prematurity, birth asphyxia, IUGR, Intra uterine death, neonatal death, SNCU/NICU admissions. In long term, preeclampsia is associated with cardiovascular diseases and a consequent increased risk for mortality.

Materials and Methods: The present prospective comparative study was carried out in hypertension complicating pregnancies who are admitted in Government General Hospital. Department of Obstetrics and Gynecology, Government General Hospital is a tertiary care teaching center where each year around 11000-12000 deliveries takes place. The study subjects are all multigravida with hypertension complicating pregnancy admitted in Government General Hospital, Kurnool and next admitted primigravidae with hypertension for comparative study.

Results: In the present study 11076 deliveries were occurred, out of these 5109 are primigravidae and whereas 5967 are multigravidae. 897 (465 primigravidae had hypertension, 432 multigravidae had hypertension) were diagnosed as hypertension complications in pregnancies. Therefore the overall incidences of hypertension complicating was found to be 8.09%, among primigravidae incidence was 9.10%, whereas multigravidae incidence was 7.23%, which was almost similar in these two groups. In this study 662 (consent subjects and after exclusion criteria) hypertension complicating pregnancies are taken. Among these 331 multigravidae 331 primigravidae.

Conclusion: The present study concluded that the incidence, almost similar but clinical course and complications are slightly different. The diseases appears to be more among the multigravidae in terms of increased maternal risk of abruption placenta, renal failure, cardiac failure, DIC, HELLP syndrome. Both maternal and fetal outcomes are same because of appropriate interventions. The course and complications supports the existing placental theories explain etiology in primigravidae and maternal theory for multigravidae. However elaborative studies including biomarkers and histopathological studies may require confirming above theories.

Key Words: Hypertension, preterm labor, PPH, abruption placenta, HELLP syndrome.

INTRODUCTION

Approximately 5-10% of women develop hypertension during the course of their pregnancies.¹ Hypertension in pregnancy produces several short and long term health consequences in the mother and fetus, including perinatal mortality. In short term, maternal outcomes in hypertension complicating pregnancy will be preterm labor, PPH, abruption placenta, HELLP syndrome, renal failure, cardiac failure, DIC and other complications and fetal outcomes in hypertension complicating pregnancy will be prematurity, birth asphyxia, IUGR, Intra uterine death, neonatal death, SNCU/NICU admissions. In long term, preeclampsia is associated with cardiovascular diseases and a consequent increased risk for mortality.²

Preeclampsia and gestational hypertension are the commonest form of hypertensive disorders in pregnancy and considered to be the disease of nulliparity. Whereas chronic hypertension is said to be common among multiparous women.

Association between primigravidae with preeclampsia supposed to be a consequence of maternal immune reaction to paternal antigen expressed in the placenta that this reaction might result in defective trophoblastic invasion and subsequent placental dysfunction. These mechanisms can be stated as placental preeclampsia.³

Whereas, the lower risk of preeclampsia among multiparous women has been attributed to desensitization after exposure to placental antigens in placenta during previous pregnancies. The lower risk has been also attributed to smoother trophoblastic invasion after modification of maternal spiral arteries during first pregnancy. So different mechanisms should be present to initiate preeclampsia in multiparous women. These mechanisms are stated as maternal preeclampsia.⁴

Another important hypertensive disorder of pregnancy is chronic hypertension with or without proteinuria. It complicates between 1 to 5 % of pregnancies. However with increasing maternal age, obesity, and the changing ethnic profile of women in their reproductive years, it is likely to increase prevalence as these all factors impact on the hypertensive disease process.⁴

Since different mechanisms are proposed as etiological factors for primigravidae versus multigravidae it need to be explored that, whether hypertension complicating pregnancy in multigravidae have same clinical features and out comes since literature is scanty in this regarding.

Present study was undertaken to compare the clinical presentation, maternal and fetal outcome of hypertensions complicating pregnancy in multigravidae versus primigravidae with emphasis on PIH so as to assess the course and consequences of PIH in primigravidae and multigravidae are same or differ which can so as to propose a hypothesis regarding the etiology of PIH in these different groups.

AIMS AND OBJECTIVES

AIM: To assess the course and consequences of hypertension complicating pregnancy in multigravidae and primigravidae to test the hypothesis regarding the etiology of hypertension complicating pregnancy in these different groups

OBJECTIVES:

1. To record and compare clinical presentation of hypertension in multigravidae and primigravidae using following parameters. Categorization of Hypertension, Severity of the disease, Time of presentation, Symptoms at presentation, Signs at presentation, Biochemical parameters, Fetal status (By Clinical and Sonological assessment).
2. To compare maternal outcome in hypertension complicating pregnancy in multigravidae and primigravidae, Preterm labor, Post-partum hemorrhage, Abruption placenta, HELLP syndrome, Renal failure, Cardiac failure, DIC
3. To compare fetal outcome in hypertension complicating pregnancy in multigravidae and primigravidae, Prematurity, Birth asphyxia, IUGR, IUD, Neonatal death, NICU/SNCU admissions.

To understand course and probable pathology differences of the disease between the groups

MATERIALS AND METHODS

The present prospective comparative study was carried out in hypertension complicating pregnancies who are admitted in Government General Hospital, Department of Obstetrics and Gynecology.

Government General Hospital is a tertiary care teaching center where each year around 11000 - 12000 deliveries takes place.

The study subjects are all multigravida with hypertension complicating pregnancy admitted in Government General Hospital, Kurnool primigravidae with hypertension for comparative study.

Inclusion criteria: All pregnant women with multigravidae with hypertension complicating pregnancy who are given consent and admitted in Government General Hospital, Kurnool compared with primigravidae with hypertension complicating pregnancy.

Exclusion criteria: Comorbid conditions complicating pregnancies like Diabetes, Thyroid, Rh negative, Multiple pregnancies, Asthma, Epilepsy, Cardiovascular diseases, Collagen vascular diseases, Non-consent subjects.

STUDY METHOD

Hypertension during pregnancy was diagnosed when the systolic pressure is 140mm of Hg or more and diastolic pressure of 90mm of Hg or more on two occasions at least 4- 6hrs apart within 7 days (28). A single reading of diastolic pressure above 110mm of Hg in pregnant women is considered as a hypertension for the purpose of evaluation and management.

Method adopted for measuring blood pressure,

1. Position of the Patient:

- For measurement, patient was in the sitting position with her right arm supported In horizontal position at the level of the heart.
- Measurement was taken after a rest period of 10 minutes or longer.

2. Equipment

- Sphygmomanometer was used for measuring the blood pressure.
- The cuff was encircled and covered two-thirds of the breadth of the arm, by using an Appropriate cuff.
- A large cuff had been used for obese patients.

3. Technique

- Inflated the cuff above the systolic pressure as recognized by disappearance of the radial pulse
- Korotkoff V (disappearance of the sound) to determine diastolic blood pressure has been used. If the sound persists when the cuff is deflated, Korotkoff IV(muffling of the sound) used to determine diastolic pressure.

Classification of Hypertensive Disorders in Pregnancy (1)

For this study US the Working group of National High Blood Pressure Education Program (NHBPEP) (2000), proposed classification of hypertensive disorders in pregnancy was adapted.

1. Gestational hypertension
2. Preeclampsia and Eclampsia
3. Chronic hypertension of any etiology
4. Preeclampsia superimposed on chronic hypertension.

Gestational Hypertension

Hypertension developing after 20 weeks of gestation, not accompanied by proteinuria, there are no biochemical or haematological abnormality blood pressure return to normal within 12 weeks final diagnosis is made only after 12 weeks postpartum. Gestational hypertension may evolve into preeclampsia.

Preeclampsia

Hypertension associated with proteinuria greater than 0.3g/L in a 24-hour urine collection or 1+ by qualitative urine examination, after 20 weeks of gestation. Preeclampsia is a pregnancy specific syndrome with onset after 20 weeks of gestation similar to Gestational Hypertension which resolves with termination of pregnancy. It is a multisystem disorder placental dysfunction not limited to Hypertension and Proteinuria, and proteinuria being an essential diagnostic criterion.

Non severe preeclampsia:

Systolic Blood Pressure greater than 140 mm of hg and diastolic Blood Pressure greater than 90 mm of hg on two successive measurements 4-6 hour apart. Proteinuria is greater than 3g in 24 hours sample or 2 plus in random sample.

Severe preeclampsia:

One or more of the criteria are present, Blood pressure reading >160/110 mm Hg, Proteinuria > 2+ dipstick, Serum creatinine >1.1 mg/dl, Platelets count < 1, 00,000/L, Microangiopathic hemolysis-increased LDH >600U/L, Oliguria, 24 hour urinary output of less than 500 ml, Visual disturbances, Epigastric pain, Headache, Convulsions, Serum transaminase elevation, Pulmonary edema, Fetal growth restriction.

Eclampsia

Convulsions occurring in a patient with preeclampsia are known as Eclampsia. The seizures are generalized and may appear before, during, or after labor.

Chronic Hypertension

Chronic hypertension is defined as hypertension present before 20th week of pregnancy or that is diagnosed preconceptionally. Blood pressure elevation that persists >12 weeks postpartum is also retrospectively considered as chronic hypertension. Essential hypertension is diagnosed when there is no apparent underlying cause for chronic hypertension.

Secondary hypertension may be caused by renal parenchymal disease or scarring, renovascular disease, endocrine disorders or coarctation of aorta.

Preeclampsia Superimposed on Chronic Hypertension

Chronic underlying hypertension is diagnosed when one or more features of preeclampsia develop for first time during pregnancy after 20 weeks, in a woman with pre-existing chronic hypertension.

Other condition-White coat hypertension, masked hypertension.

Details of pregnant women

Maternal age, Number of fetus, Parity, Prior obstetric history, Co-existing medical and surgical conditions, Family history of hypertension complicating pregnancy, Current obstetric history, Clinical examination including ultrasound imaging and laboratory reports, Data regarding present and previous pregnancies including blood pressure recordings will be collected from records if available.

Maternal outcomes in hypertension complicating pregnancy:

Preterm labor:

Preterm labor was defined by WHO as the onset of labor prior to the completion of 37 weeks of gestation, in pregnancy beyond 20 weeks of gestation, with birth weight above 500 grams.

Abruptio placenta: Premature separation of normally situated placenta after 20 weeks of gestation and before delivery.

DIC (Disseminated intravascular coagulation):

DIC was a thrombo-haemorrhagic disorder occurring as a consequence of aberrant activation of the coagulation cascade. Placental abruption was the most common cause of DIC in pregnancy.

Acute renal failure: Acute renal failure was defined as elevated creatinine (>1.5 mg/ dl) or oliguria of 24-hour or longer duration.

HELLP syndrome: Severe form of preeclampsia characterized by hemolysis (abnormal peripheral blood smear, bilirubin 1.2 mg/dl), thrombocytopenia (<100,000/mm³) and elevated liver enzymes (AST 70 U/L, LDH 600 U/L).

Postpartum Hemorrhage: Loss of 500ml or more of blood from the genital tract within 24 hours of the birth of a baby following vaginal delivery, 1000ml or more following caesarean delivery.

Fetal outcomes in hypertension complicating pregnancy:-

Prematurity:

Neonates born at less than 37 weeks gestation. Near term 34-36 weeks, Moderate prematurity 32-33 weeks, Severe prematurity 28-31, Extreme prematurity <28 weeks.

Birth asphyxia: Birth asphyxia was medical condition resulting from deprivation of oxygen to a newborn infant that lasts long enough during the birth process to cause physical harm, usually to the brain.

IUGR (Intrauterine Growth Restriction): Any baby with birth weight below 10th percentile for gestational age who fails to achieve its genetic growth potential with signs of chronic hypoxia or failure to thrive.

Small for Gestational Age: Infants whose weights were below 10th percentile for the gestational age. It is used as a synonym for IUGR but it also includes constitutionally small babies.

Intra uterine death: Antepartum death occurring beyond 28 weeks is termed as intrauterine fetal death.

Neonatal death: Neonatal death was defined as a newborn death during the first 28 days of life.

Declaration of conflict of interest:-

Informed consent will be taken from all the study Subjects. No cost will be imposed on subjects. Principle investigator has no conflict of interest to declare as the present investigation is undertaken as a part of academic course.

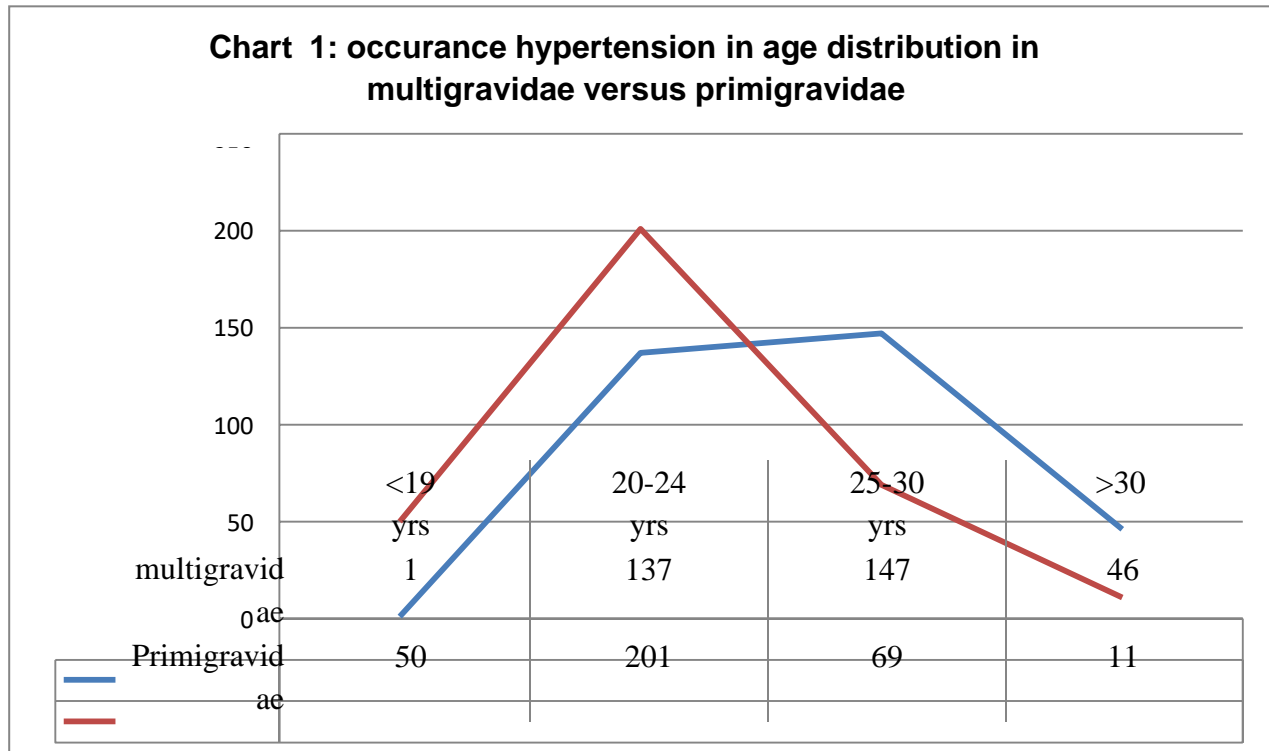
RESULTS

In the present study 11076 deliveries were occurred, out of these 5109 are primigravidae and whereas 5967 are multigravidae.897 (465 primigravidae had hypertention, 432 multigravidae had hypertention) were diagnosed as hypertension complications in pregnancies. Therefore the overall incidences of hypertension complicating was found to be 8.09%,among primigravidae incidence was 9.10%, whereas multigravidae incidence was 7.23%,which was almost similar in these two groups.

In this study 662 (consent subjects and after exclusion criteria) hypertension complicating pregnancies are taken. Among these 331multigravidae 331 primigravidae.

TableNo-1: Occurrence of hypertension in age group distribution

S.No	Age group	Multigravidae	Primigravidae
1	<19 years	1(0.30%)	50(15.11%)
2	20-24 years	137(41.39%)	201(60.73%)
3	25-30 years	147(44.74%)	69(20.85%)
4	>30 years	46(13.90%)	11(3.32%)

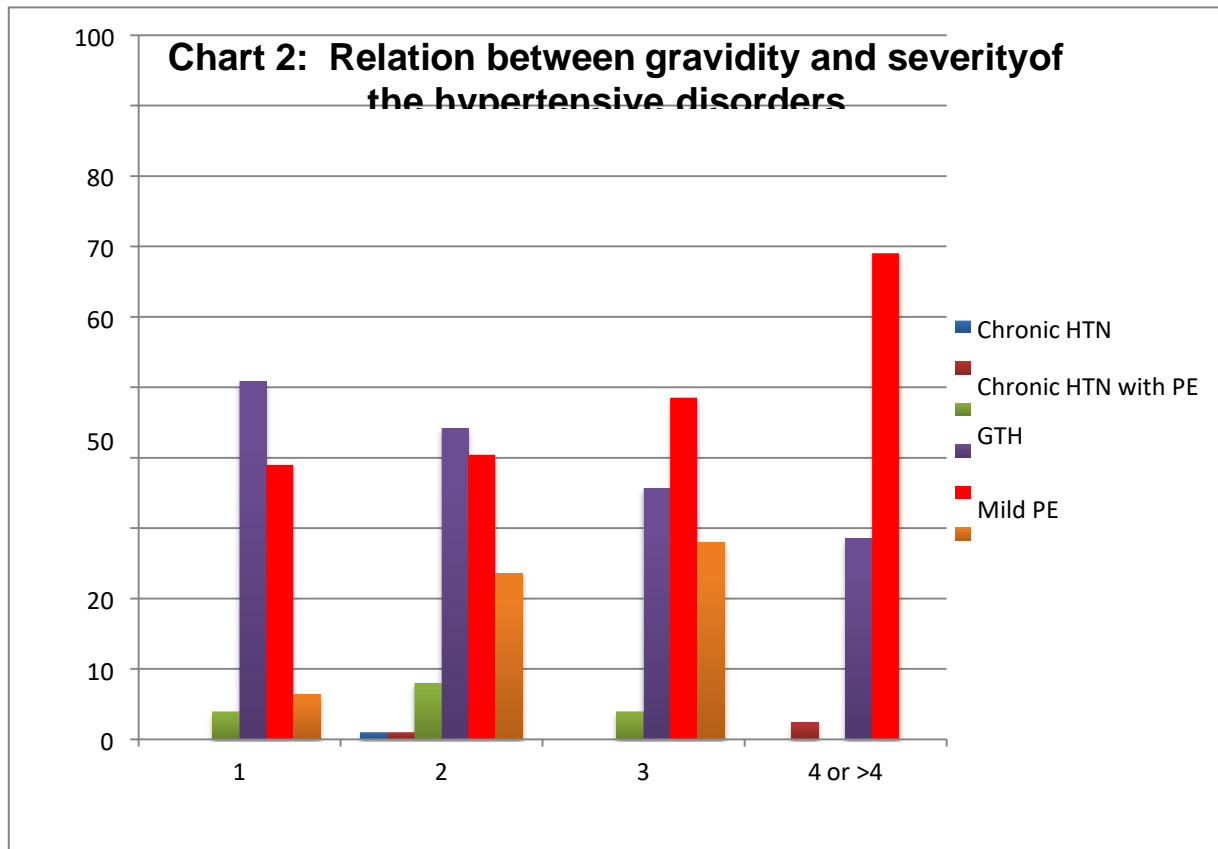


The incidence of Hypertension complicating pregnancies peak in age group of 20-24 years both in primi and multigravidae. The prevalence of Hypertension remains relatively high in multigravidae while declines in primigravidae as the age advances.

Table 2:- Comparison of type of hypertension in pregnancy multigravidae versus primigravidae

S no	Type of hypertension	Multigravidae	primigravidae	P value
1	Gestational hypertension	19(5.74%)	13(3.92%)	0.27
2	Non severe preeclampsia	131(39.58%)	168(50.76%)	0.03
3	Severe preeclampsia	154(46.53%)	129(38.97%)	0.04
4	Antepartum eclampsia	22(6.65%)	23(6.94%)	0.87
5	Postpartum eclampsia	3(0.9%)	1(0.3%)	0.31
6	Imminent eclampsia	47(14.1%)	46(13.8%)	0.91
7	Chronic hypertension with preeclampsia	4(1.2%)	1(0.3%)	0.17
9	Chronic hypertension without preeclampsia	3(0.9%)	1(0.3%)	0.31

The above table shows Incidence of mild preeclampsia and severe preeclampsia statistically significant (p value <0.05) in multigravidae, the incidence of eclampsia almost similar in both groups clinically, but there no statistical significance.



The above chart shows gravidity increases severity also increases.

Table 3: Comparison of symptoms of hypertension in pregnancy multigravidae versus primigravidae

S.No	Symptoms	Multigravidae	Primigravidae	P value
1	Swelling Of Foot	262 (79.15%)	262 (79.15%)	1
2	Headache	34(10.27%)	40(12.08%)	0.45
3	Epigastric Pain	3(0.9%)	1(0.3%)	0.31
4	Decreased Urine Output	2(0.6%)	1(0.3%)	0.56
5	Blurring Of Vision	8(2.42%)	4(1.2%)	0.24

6	Seizures	22(6.65%)	23(6.95%)	0.87
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Above table shows that symptoms of hypertension complicating pregnancy almost similar in both multigravidae and primigravidae.

Table-4: Comparison of signs of hypertension in pregnancy multigravidae versus primigravidae.

S.No	Signs	Multigravidae	Primigravidae	P value
1	High BP Recordings	331	331	1
2	Abnormal weight gain	8	9	0.80
3	Convulsions	22	23	0.87

The present study shows that signs of hypertension complicating pregnancy in multigravidae versus primigravidae are almost similar. Mean SBP in multi was 153mm of Hg; mean DBP was 96 mm of hg. Whereas mean SBP in primi was 149 mm Hg, DBP was 100 mm of Hg.

Table No-5:- Comparison of maternal outcomes in hypertension in pregnancy multigravidae versus primigravidae

S.No	Maternal outcomes	Multigravidae	primigravidae	P value
1	Preterm	76(22.9%)	67(20.2%)	0.39
2	Abruption placenta	12(3.63%)	3(0.9%)	0.01
3	Postpartum hemorrhage	15(4.5%)	9(2.7%)	0.21
4	Renal failure	5(1.5%)	1(0.3%)	0.10
5	Cardiac failure	3(0.9%)	2(0.6%)	0.65
6	HELLP syndrome	10(3.1%)	3(0.9%)	0.04
7	DIC	2(0.6%)	1(0.3%)	0.56
8	Meconium stained liquor	25(7.5%)	33(9.9%)	0.27
9	Oligohydramnios	22(6.6%)	20(6.04%)	0.74

10	Polyhydramnios	4(1.2%)	2(0.6%)	0.54
11	Past dates	25(7.5%)	21(6.34%)	0.34
12	PROM	31(9.3%)	29(8.7%)	0.78

The incidence of abruption placenta and HELLP syndrome were more in multigravidae, which are statistically significant. The incidence of postpartum hemorrhage, renal failure, and cardiac failure has no statistical significance but clinical significance is present. The remaining maternal complications are almost similar in multigravidae and primigravidae.

Table 6: Comparison of fetal outcomes in hypertension in pregnancy multigravidae versus primigravidae

S.No	Fetal outcomes	Multigravidae	primigravidae	P value
1	Prematurity	76(22.9%)	67(20.2%)	0.39
2	IUGR	50(15.10%)	38(11.4%)	0.16
3	IUD	33(9.96%)	20(6.04%)	0.06
4	Birth asphyxia	15(4.5%)	13(3.9%)	0.69
5	Neonatal death	18(5.4%)	17(5.1%)	0.86
6	NICU/SNCU admissions	55(16.6%)	57(17.2%)	0.83

The above table reflects comparison of fetal outcomes in hypertension in pregnancy multigravida versus primigravidae. The incidence of IUD in multigravidae is 9.96% higher than the primigravidae 6.04% the cause of IUD may be severe preeclampsia. whereas the remaining other fetal outcomes incidence is almost similar.

Table-7: Comparison of delivery outcomes in hypertension in pregnancy multigravida versus primigravidae

S.No	Type of delivery	Multigravidae	Primigravidae	P value
1	Normal labor	135(40.78%)	132(39.79%)	0.81
2	Abnormal labor with outlet forceps	6(1.8%)	12(3.6%)	0.15
3	Abnormal labor with Vacuum	4(1.2%)	10(3.02%)	0.10

4	preterm delivery	76(22.9%)	67(20.2%)	0.39
5	IUD	27(8.1%)	19(5.7%)	0.24
6	Emergency cesarean section	112(33.8%)	132(39.87%)	0.10
7	Elective cesarean section	4(1.2%)	3(0.9%)	0.70

The incidence of normal vaginal deliveries is similar in both groups. The indication for instrumental vaginal deliveries in multigravidae due to failed maternal forces; where as in primigravidae is due to fetal distress. The cesarean section incidence is similar in both groups.

Table 8:- Comparison of type of induction in hypertension in pregnancy multigravidae versus primigravidae

S.No	Induction type	Multigravidae	Primigravidae
1	No induction	50(15.10%)	4(1.2%)
2	Stripping	4(1.2%)	1(0.3%)
3	Foleys induction	80(24.16%)	249(75.22%)
4	Cerviprime gel induction	28(8.4%)	25(7.55%)
5	Misoprostol induction	2(0.6%)	5(1.5%)
6	Oxytocin drip	170(51.35%)	48(14.50%)

When pregnant women present with hypertension complicating pregnancy in case of severe preeclampsia and eclampsia, the treatment of choice is termination of pregnancy. So labor is induced by various methods in both groups.

Table 9:- Comparison of Birth weight in hypertension in pregnancy multigravidae versus primigravidae

S.No	Birth weight	Multigravidae	Primigravidae	P value
1	Normal birth weight	199(35.95%)	230(69.48%)	0.11
2	Low birth weight	94(28.39%)	74(22.35%)	0.07
3	Very low birth weight	17(5.15%)	16(4.8%)	0.85
4	Extremely low birth weight	16(4.8%)	11(3.3%)	0.32
5	Big baby	5(1.5%)	1(0.3%)	0.10

The above table shows in multigravidae there is clinical significance present in the incidence of low birth weight.

Table 10: Recurrence of hypertension

S.No	Gravida	Number of subjects	Percentage
1	Second gravidae	17	5.1%
2	Third gravidae	19	5.7%
3	Fourth gravidae	22	6.6%

Above table shows the recurrence of hypertension increases with gravidity.

DISCUSSION

The present study shows the clinical course and outcomes of hypertension complicating pregnancies are slightly different in multigravidae compared to primigravidae though the prevalence is almost similar. In multi gravidae the disease is more severe and adverse events are more common.

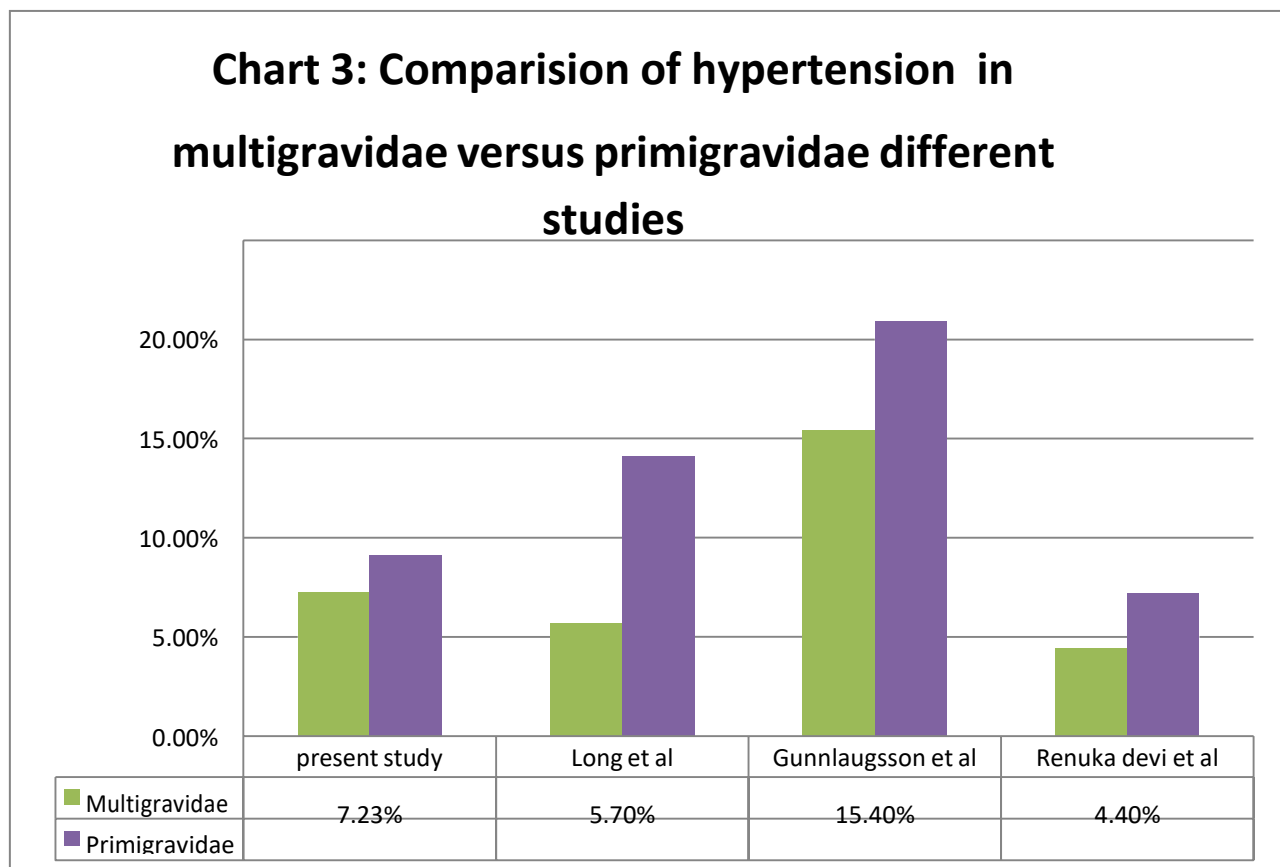
During this study period 11076 deliveries have taken place. Among these parturient women, 897 were diagnosed to be affected by hypertension in pregnancies. Therefore the overall prevalence of hypertension complicating was found to be 8.09%. Among primigravidae prevalence was 9.10%, whereas multigravidae prevalence was 7.23%, showing not much difference.⁶

Table 11:- comparison of prevalence of hypertension in different Indian studies.

S.No	Studies	Overall Incidence of Hypertension in %
1	Present study	8.09%
2	Vidyadhar et al	8.96%
3	Shahla et al	9.8%
4	Renuka devi et all	11.6
5	Gogaram et al	9.2%

6	Long et al	9.3%
7	Gunnlaugsson	17.4%

The incidence of hypertension complicating pregnancy of the present study in concurrence with that of other studies conducted in India. This reflects the homogeneity of Indian population, making them comparable regarding other parameters. The high prevalence found in Iceland may be attributable to Socio environmental factors prevailing there.



The above chart it can be inferred that hypertension complicating pregnancies common in primigravidae all over the world.

Influence of Age and parity in the prevalence of hypertensive complicating pregnancies

The incidence of Hypertension complicating pregnancies peak in in age group of 20-24 years both in primigravidae and multigravidae. The prevalence of Hypertension remains relatively high in multi gravidae while declines in primigravidae as the age advances. It shows that parity also may play a role in genesis of hypertension complicating pregnancy and it also implies that multiparity will not protect against all types of hypertensive disorder in pregnancies.⁷

Sajith et al, reported that highest incidence of hypertension was occurred in age group of 18-22 years and attributed high incidence in this group due to the majority of conceptions take place

in this age group. But present study and other studies shows peak incidences between 20-24 years probably due to less number of teenage pregnancies and parts of country where the study was carried out.

Table No 12: Comparison of prevalence of preeclampsia in different studies

S.No	preeclampsia	Present study	Ronnaug et al	Renukadevi et al
1	Multigravidae	85.4%	36%	39%
2	Primigravidae	89.12%	64%	61%

Primiparity is definitely a risk factor for Preeclampsia. The equal prevalence in the present study may be due to referrals to the institution where the study is undertaken. Only severe hypertension multigravidae refer to tertiary care center. So this may not reflect its true picture.

With regard to the relation between severity and gravidity (Viz Chart no 2). The severity of the disease increases with gravidity. This may be due to associated vascular changes in advanced maternal age.⁸

Recurrence of Preeclampsia

In the present study the recurrence of preeclampsia in second gravidae, third gravidae and fourth gravidae was 5.1%,5.7%,6.6% respectively. The increasing incidence of recurrence of preeclampsia in the consecutive pregnancies in multigravidae may be due to associated vascular changes in advanced maternal age as already mentioned above. It is also noteworthy that with increasing parity the severity of the disease does increase.

Maternal outcomes:-

Table No.13:- Overall incidence of preterm labor in hypertension complicating pregnancies.

S No	Studies	Overall incidence of preterm labor
1	Present study	20.60%
2	Shahla et al	52.60%
3	Vidyadhar et al	27%

The incidence of preterm labor in the present study is in agreement with the other study and also falls within the range quoted generally. The high incidence in Shahla et al, study was explained by the authors themselves as result of induction.

Table 14:- Comparison of incidence of preterm labor in hypertension complicating pregnancies.

S No	Gravida	Present study	Kaur et al
1	Multigravidae	22.9%	4.16%
2	Primigravidae	20.2%	9.61%

Abruptio placenta:

Table 15: comparison of incidence of abruption placenta in hypertension complicating pregnancies.

S. no	Gravida	Present study	Long et al
1	Multigravidae	3.6%	1.4%
2	Primigravidae	0.9%	2.1%

In our study the incidence of abruption 3.6% in multigravidae, 0.9% in primigravidae there is statistically significance (p value 0.01%) this is may be due to vascular pathology in multigravidae. Though the incidence is more among primi in Long et al study , in that study there was a relation between early onset PIH and abruption. In the present study the onset of PIH was relatively early among multigravidae (22 versus 24 wks.) probably explain high incidence of abruption among multigravidae. This early onset may also be due to preexisting vascular pathology.⁹

Postpartum hemorrhage:-In present study the incidence of postpartum hemorrhage 4.53% in multigravidae, where as in primigravidae the incidence of postpartum hemorrhage 2.71%. There is no statistically significance but clinical significance is present due to vascular pathology.

Renal failure:

Table 16:- Comparison of incidence of renal failure in hypertension complicating pregnancies.

S.No	Gravida	Present study	Baden et al
1	Multigravidae	1.5%	5%

2	Primigravide	0.3%	0%
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Though not as high as quoted by Baden et al, in the present study also renal impairment was relatively more among multigravidae. This may be due to vascular pathology making the disease more severe.

Cardiac failure: In our study incidence of cardiac failure in multigravidae is 0.9% where as in primigravidae is 0.6%, this may be due to vascular pathology as age advances the incidence of cardiac failure also increases.

HELLP syndrome:-

Table 17: Incidence of HELLP syndrome

S.No	Name of study	HELLP Syndrome
1	Present study	1.9%
2	Ronnaug et al	5%
3	Shahla et al	4.9%
4	Sachan et al	2.8%

In our study the incidence of HELLP syndrome is 3.02% in multigravidae, 0.9% in primigravidae, there is statistical significance is present (p value 0.04)

Keith p Williams et al, conducted a study where they divided the subjects into three groups Group A primigravidae primiparous, where Group B multigravidae primiparous, Group C multiparous and he said that the incidence of HELLP syndrome was similar in group A(35%) and group B(50%) but lower in group C(19%) and hence attributed the increased risk to parity rather than to gravidity. However since no such analysis was made in the present study no definite inference can be drawn about the above statement.¹⁰

Low incidence of HELLP syndrome compared to others studies may be due to not investigated properly in many women because of emergency logistic problems.

Oligohydramnios:-

Table: 18 comparison of incidence of oligohydramnios in hypertension complicating pregnancies.

S.No	Gravida	Present study	Kaur et al
1	Multigravidae	6.6%	10.41%
2	Primigravidae	6.0%	17.30%

In the present study the incidence of oligohydramnios similar in both groups. In Kaur et al study controversial regarding the oligohydramnios. From the results of the present study and also comparable studies it can be concluded that maternal complications are more among the multiparous women affected by hypertensive diseases than their counter parts.

Fetal out comes:

IUGR:

Table 19:- Incidence of IUGR in hypertension complicating pregnancies

S.No	Studies	Overall incidence of IUGR
1	Present study	13.29%
2	Shahla et al	9.8%
3	Vidyadhar et al	20%

Table 20:- Comparison incidence of IUGR in hypertensive complicating pregnancies.

S No	Gravida	Present study	Kaur et al	Renukadevi et al
1	Multigravidae	15.1%	6.25%	9%
2	Primigravidae	11.4%	19.25%	7.5%

Keith p Williams et al found same incidence of SGA infants among women with preeclampsia groups A 14% B 11% C 12%.

The incidence of IUGR relatively more common in multigravidae may be due to vascular pathology. Kaur et al, differ from the present study cause reason not properly explained in that study.

IUD:

Table : 21 comparison of incidence of IUD in hypertension complicating pregnancies.

S no	Gravida	Present study	Renukadevi et al
1	Multigravidae	9.9%	3.2%
2	Primigravidae	6.04%	1.8%

Birth asphyxia: Our present study shows that the incidence of Birth asphyxia in multigravidae was 4.5%, where as 3.9% in primigravidae. Almost same incidence in both groups.

Neonatal deaths: Our present study shows that the incidence of Neonatal deaths in multigravidae was 5.4%, where as 5.1% in primigravidae. Almost same incidence in both groups.

NICU/SNCU Admissions: Our present study shows that the incidence of NICU Admissions in multigravidae was 16.6%, where as 17.2% in primigravidae. Almost same incidence in both groups. The present study shows that birth weight affected more in multigravidae when comparative with primigravidae. Birth asphyxia, Neonatal death , NICU Admissions are improves by when timely appropriate intervention taken. During the study period difficulty felt to get consent, for comparative study multigravidae followed primigravidae and getting the investigation also felt difficult in many pregnant women because of emergency logistic problems.

LIMITATIONS

- All primigravidae not included in this study
- All investigations not done in this study
- Comorbid conditions are excluded in this study, most of the comorbid conditions associated with hypertension complicating pregnancies.

CONCLUSION

The present study concluded that the incidence, almost similar but clinical course and complications are slightly different. The diseases appear to be more among the multigravidae in terms of increased maternal risk of abruption placenta, renal failure, cardiac failure, DIC, HELLP syndrome. Both maternal and fetal outcomes are same because of appropriate interventions. The course and complications supports the existing placental theories explain etiology in primigravidae and maternal theory for multigravidae. However elaborative studies including biomarkers and histopathological studies may require confirming above theories.

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