IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 9 Ser.11 (September. 2021), PP 37-50
www.iosrjournals.org

"Prospective Study of End Organ Changes In Hypertensive Disorders in Pregnancy and Fetomaternal Outcomes in Gandhi Hospital"

*Dr.Jyothirmayi Bangari, Dr.Bandi Indu[1], Dr.R.Priyadarshini[2], Dr.G.Sharmila[3]
** Assistant Professor, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.*
1. Postgraduate, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.
2. Assistant Professor, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.
3. Professor, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.
**Corresponding Author:- Dr.Jyothirmayi Bangari, Assistant Professor of Obstetrics & Gynaecology, Gandhi Medical College/Hospital, Secunderabad, Telangana State*

Abstract:
Background:
Hypertension is a significant public health problem worldwide. It generates a large number of cardiovascular, neurological, renal, and ophthalmological complications. Target organ damage resulting from hypertension includes those affecting the brain, heart, kidneys, and eyes. Several cardiovascular, pulmonary, and neurological symptoms were associated with patients in a hypertensive emergency with target organ involvement. It should be extensively evaluated in a patient who presents with any of these symptoms and elevated blood pressure to exclude a hypertensive emergency.
Objectives: *To determine End Organ changes and Feto-Maternal outcome in women with hypertension disorders in pregnancy.*
Methods: *A Prospective study done on pregnant women brought with hypertensive disorders in pregnancy, admitted to Gandhi hospital, Secunderabad, Telangana State over 2 years.*
Results: *We have observed that there was is a significant association between hypertensive disorders of pregnancy and ECG changes, 2D Echo changes, Fundoscopy changes, abnormal renal function test changes (p value < 0.05, Fisher's exact test). There is also a significant association between HDP and renal parenchymal changes on ultrasound and urine output (p value < 0.05, Fisher's exact test).*
Conclusion: *Majority of the patients at risk of preeclampsia are primi presenting with severe preeclampsia, the most common effected end organ kidney, affecting the maternal outcome.*
Key Words: *Hypertensive disorders in pregnancy, maternal outcome, End organ changes.*

Date of Submission: 10-09-2021 Date of Acceptance: 25-09-2021

I. Introduction

Hypertension is a significant public health problem worldwide. It generates a large number of cardiovascular, neurological, renal, and ophthalmological complications. The measurement of blood pressure (BP) is one of the constant parameters of evaluating patients presenting to the emergency department, whatever the reason for consultation and the patient's history. The interpretation of blood pressure is modulated by age, gender, and other factors such as measurement patterns, reception conditions, emotional factors, and the diversity of clinical situations.[1]

Hypertension affects individuals of all classes and across all age groups. The relationship between blood pressure and the risk of cardio vascular disease events is continuous, consistent, and independent of other risk factors. Several cardiovascular, pulmonary, and neurological symptoms were associated with patients in a hypertensive emergency with target organ involvement.

Hypertension and its complications are ranked third as a leading cause of maternal mortality, responsible for over 17% of maternal deaths.[2]

The primary complications in pregnancy are Preeclampsia, eclampsia and imminent eclampsia.

Pre-eclampsia is described as a rise in blood pressure and Proteinuria, which is new-onset, occurring after 20 weeks of gestation. It is described as severe Preeclampsia if there is a substantial increase in blood pressure and Proteinuria or symptoms due to end-organ damage. Pre-eclampsia is considered early onset if the elevation of blood pressure and Proteinuria occur before 34 weeks of pregnancy

In the case of early-onset severe Pre-eclampsia, there is a progressive deterioration in the health condition of the mother and also high morality in the fetus during the perinatal period. Delivery of the fetus is considered the only way to revert all these complications. So, termination of pregnancy is needed if there is fetal distress, in case of multi-organ dysfunction or if the gestation age reaches 34 weeks. But, prematurity due to early termination causes high perinatal morbidity and mortality[3] Accelerated fetal lung maturation does not occur in preeclampsia[4]; however, expectant management to prolong pregnancy can be harmful to the mother. Hence, the fetus's potential benefits should be weighed against the potential dangers that occur to the mother. [5,6]

Severe Pre-eclampsia with prodromal symptoms is called Imminent eclampsia.The prodromal symptoms are headache, epigastric pain, nausea, vomiting, and blurring of vision. Eclampsia is the occurrence of seizure or coma in preeclamptic women. Eclampsia can occur at any period of Pregnancy, antepartum, intrapartum, and postpartum. Antepartum eclampsia is more common. The typical symptoms of Preeclampsia are hypertension and Proteinuria. Some cases may present without these classical symptoms called atypical pre-eclampsia/ eclampsia.

There are many determining factors affecting the maternal and perinatal outcome in eclampsia. Eclampsia is more common in antenatal mothers who didn't have proper antenatal checkups. Eclampsia is expected in low socio-economic groups, and various epidemiological factors affect the maternal and perinatal outcome. Eclampsia is common in primigravida and occurs more commonly in the last trimester. The maternal and perinatal outcomes also depend on the nature of fits and how soon patients receive treatment, and the quality of treatment. Imminent symptoms usually precede eclampsia. By proper antenatal care, early detection of Preeclampsia, and prompt management, eclampsia, and its complication are reduced.

II. Aims & Objectives:

AIMS:

To determine End Organ changes and Feto-Maternal outcome in women with hypertension disorders in pregnancy.

OBJECTIVES:

To study the influence of various factors in the primary outcome of the pregnant females presenting with hypertension.

III. Materials And Methods:

The present study was done on patients admitted to Gandhi Hospital, a tertiary referral center situated in Secunderabad, Telangana, over two years.

Selection criteria

Inclusion criteria

Pregnant women brought with hypertension disorders in pregnancy to Gandhi Hospital during a period of two years (November2018 to May 2020)

Exclusion criteria

- Patient's refusal or inability to provide informed consent.
- Patients who are known case of Epilepsy and other Neurological diseases.
- Patients with other conditions like Diabetes mellitus,renal disorders, heart diseases, thyroid disorders, maternal infections, and autoimmune disorders.

Source of data

100 cases of hypertension disorders in pregnancy reporting to the Gandhi hospital in two years.

Type of study

Prospective study

Study protocol

All the patients diagnosed with gestational hypertension, Preeclampsia, superimposed Pre-eclampsia, or eclampsia from November 2018 to May 2020 and their medical records are reviewed. General patient characteristics, obstetrical history, possible risk factors, information about the current pregnancy antenatal clinic attendance are recorded. Symptoms and complications are noted. Statistical analysis is done.

The information thus obtained was recorded in the proforma, a copy of which is furnished in the annexure. Blood pressure was recorded in these patients at the time of admission, after one hour, after 24 hours, and at the time of discharge. Detailed clinical examination was done in these patients with the examination of the respiratory system, cardiovascular system, abdomen, and central nervous system. Clinical examination also

included fundoscopic examination in all the patients. Blood samples of these patients were evaluated for biochemical abnormalities.

The routine investigations done in these patients were the hemoglobin, total count, differential count, blood sugar, serum urea, serum creatinine serum electrolytes, microalbuminuria, and urine analysis. All patients underwent electrocardiography. Patients with clinical suspicion of neurological deficits were evaluated with computed tomography of the brain. Patients with cardiovascular dysfunction clinically were evaluated with echocardiography, and patients with renal dysfunction underwent renal sonography.

Analysis

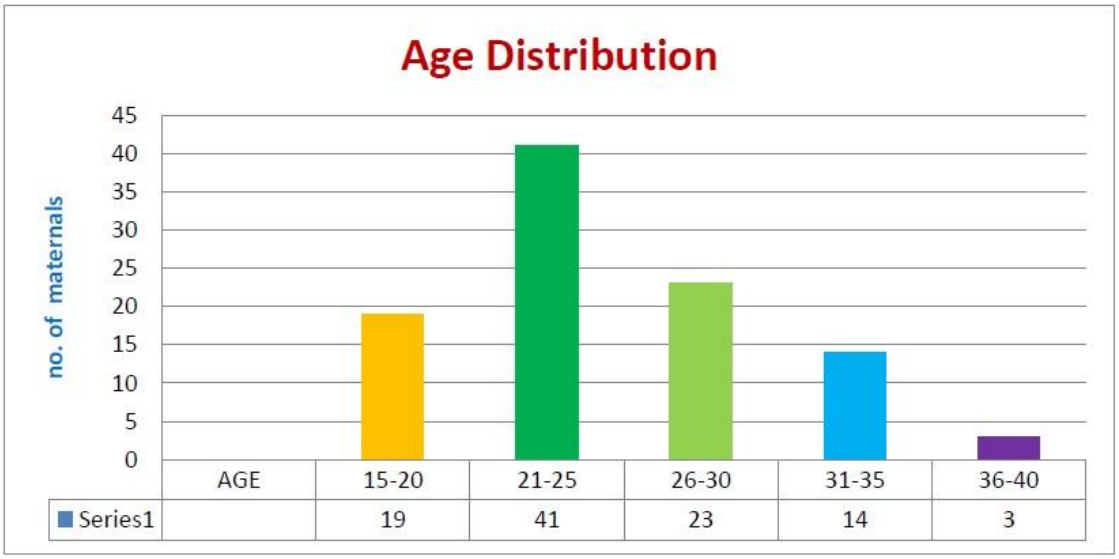
The collected data was analyzed using Microsoft Excel software.

IV. Results And Analysis

INCIDENCE

A total of 100 cases admitted into the Dept. of Obstetrics and Gynecology, Gandhi Medical College and General Hospital, Secunderabad, from November 2018 to May 2020.

FIGURE 1 - AGE DISTRIBUTION

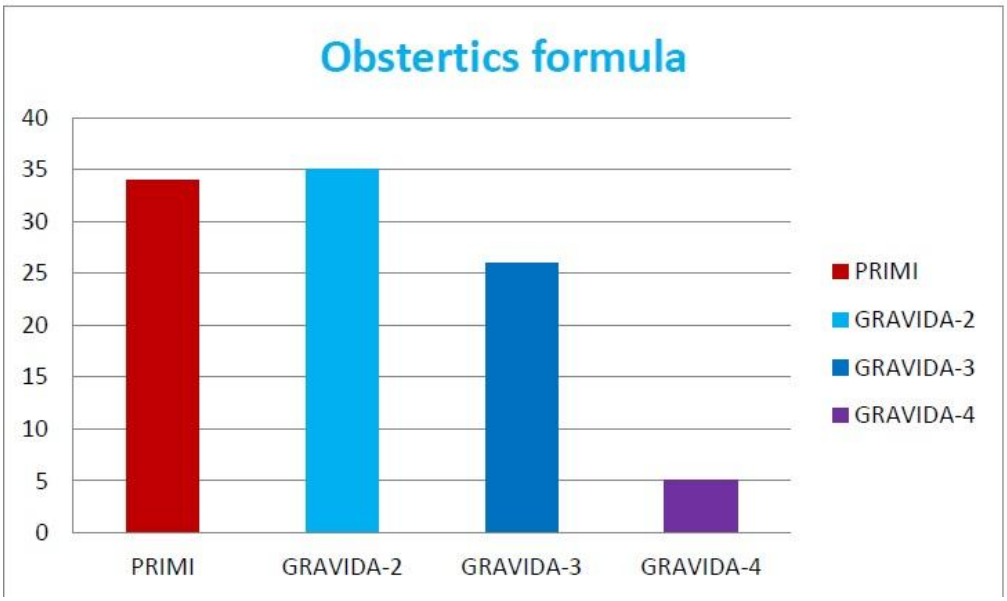


In our study of 100 patients, most of the patients present between the age of 21-25 (41%), and 3% of patients were between 36-40 years.

FIGURE 2 – BOOKED OR UNBOOKED CASES

In our study of 100 patients, most of the patients were un-booked constituting of about 76% and only 24% were booked cases.

FIGURE 3 – OBSTETRIC FORMULA



In the present study most of the pregnant patients fall in second Gravida constitutes of 35% followed by Primi and least by the fifth gravid.

FIGURE 4 – GESTATIONAL AGE

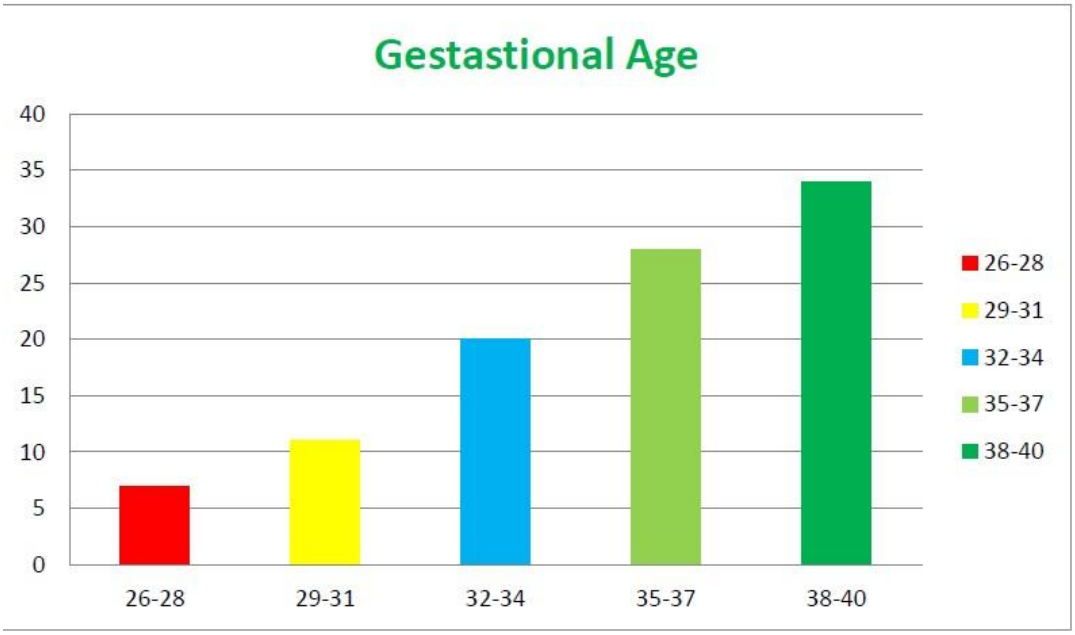
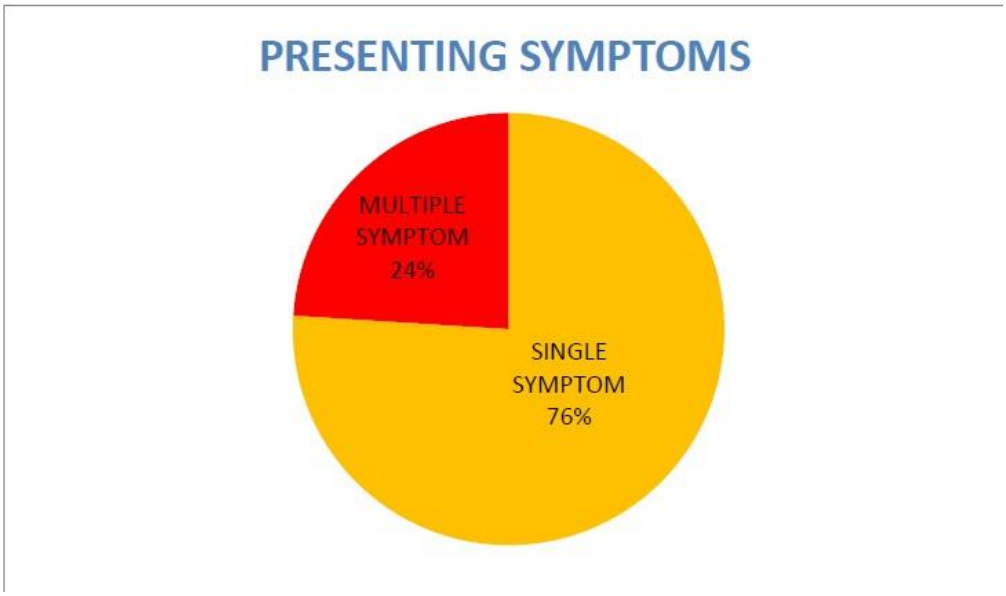
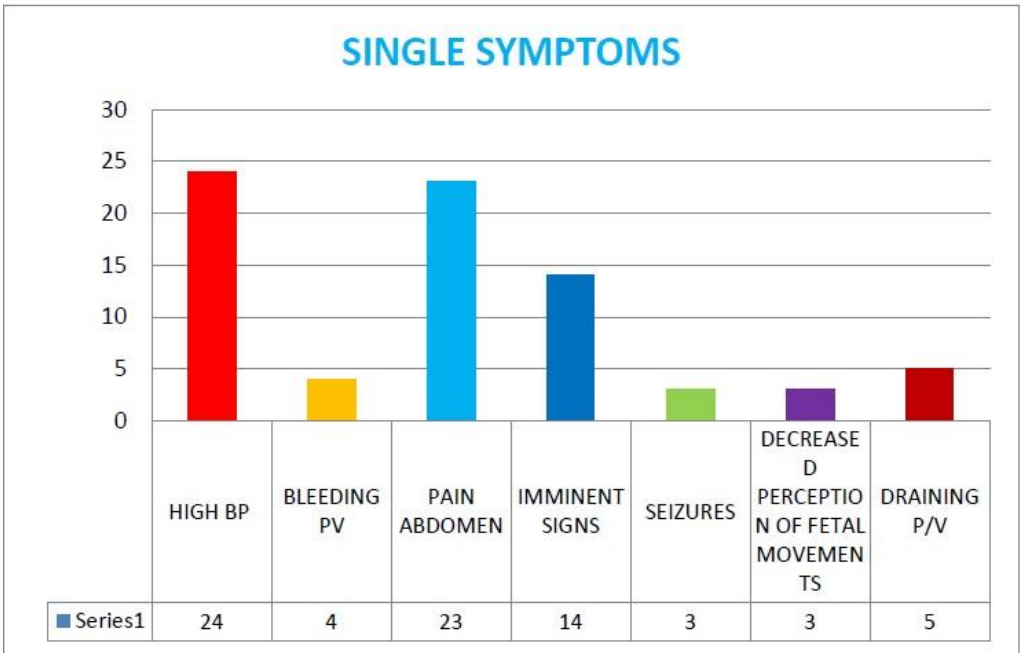
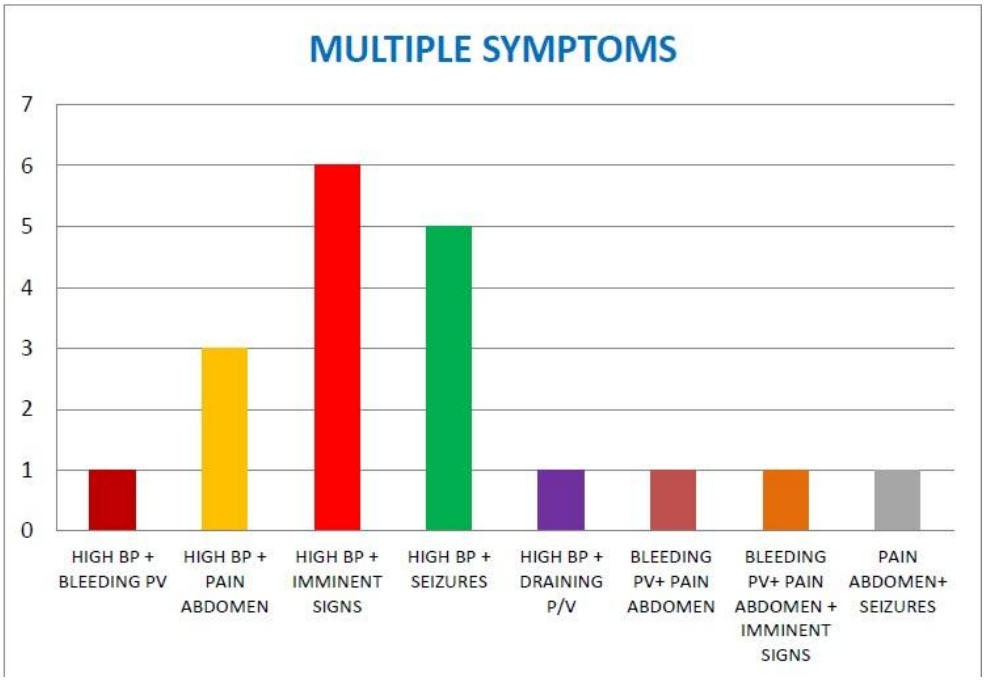


FIGURE 5 – PRESENTING SYMPTOMS







In the present study, the presenting symptoms in these patients were high blood pressure with imminent signs followed by high blood pressure with pain abdomen.

FIGURE 6 – SYSTOLIC BLOOD PRESSURE AT THE TIME OF ADMISSION

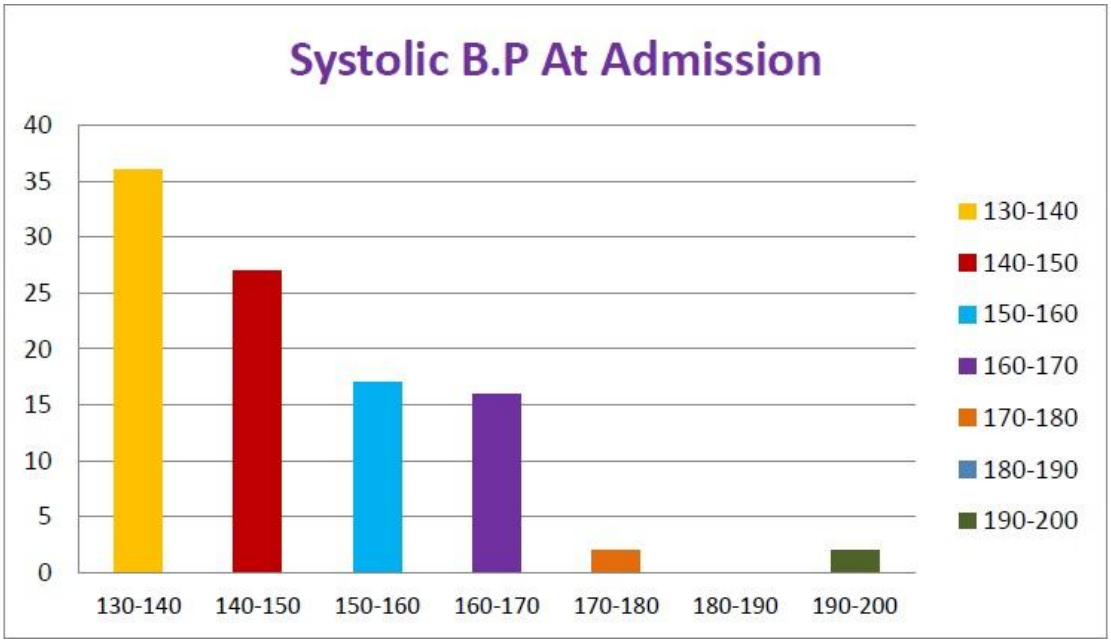


FIGURE 7 – DIASTOLIC BLOOD PRESSURE AT THE TIME OFADMISSION

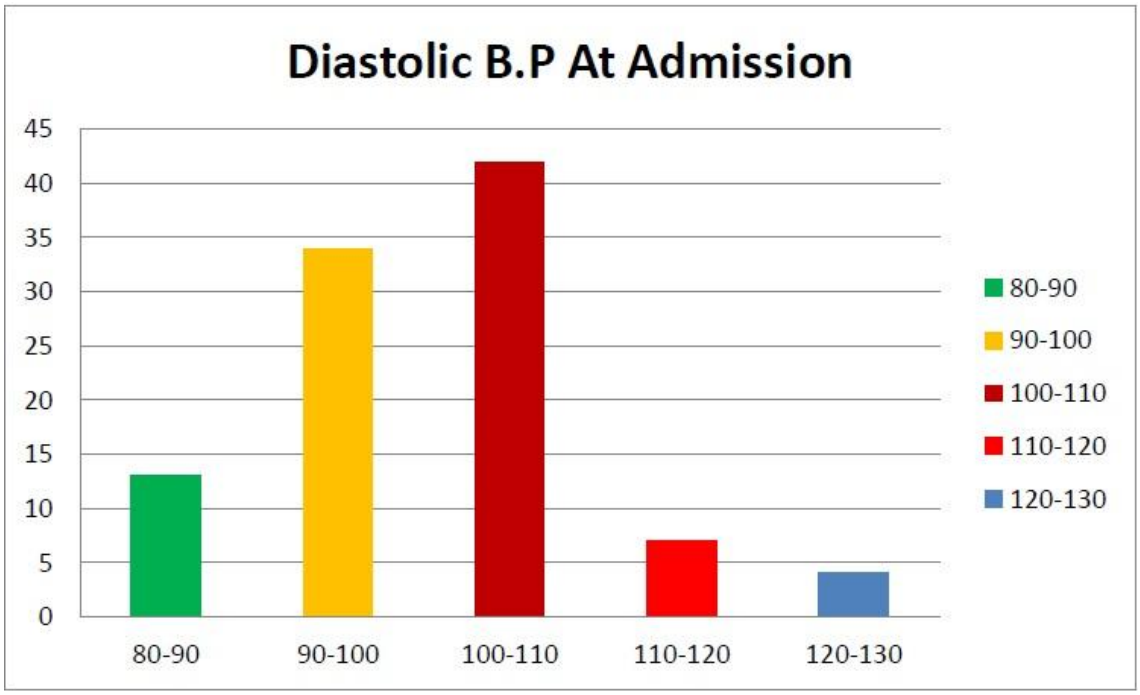


FIGURE 8 – TYPES OF HYPERTENSION

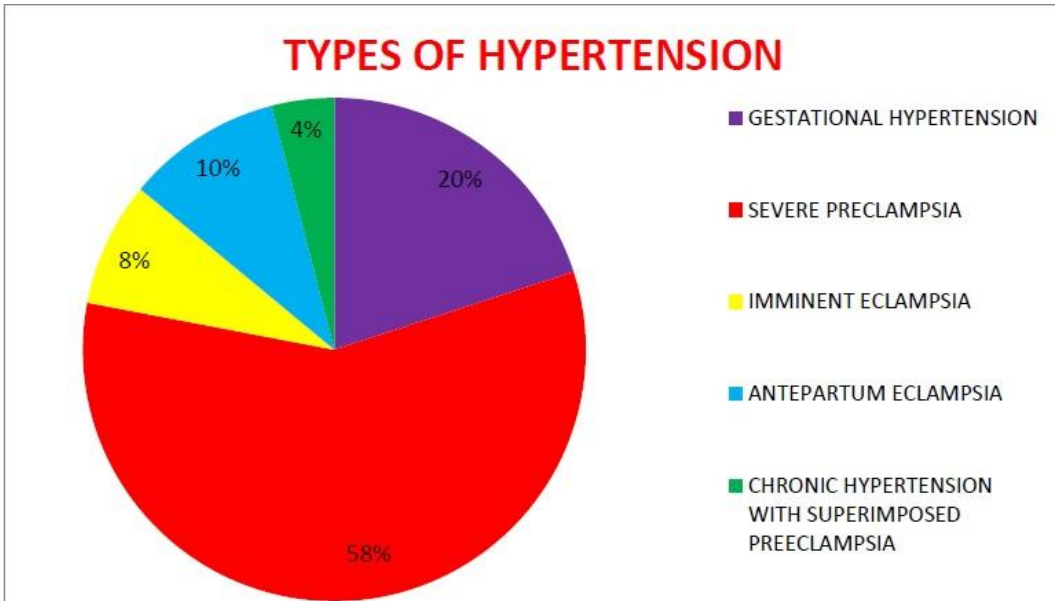


FIGURE 9 – TREATMENT

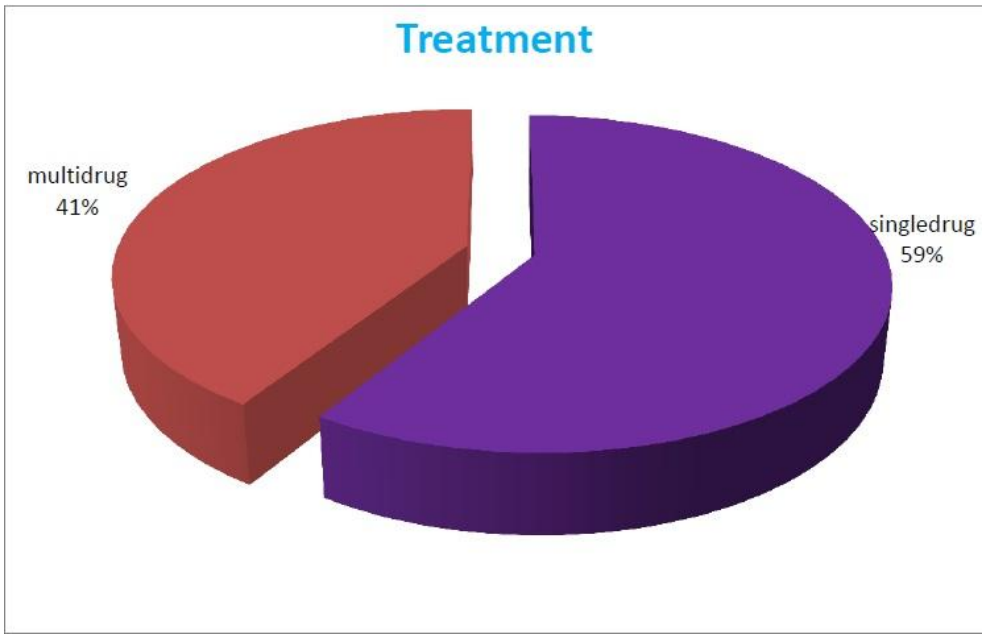


TABLE 1 – PRETERM & TERM

	FREQUENCY	PERCENTAGE
PRETERM	59	52
TERM	41	48
TOTAL	100	100

FIGURE 10 – IUGR

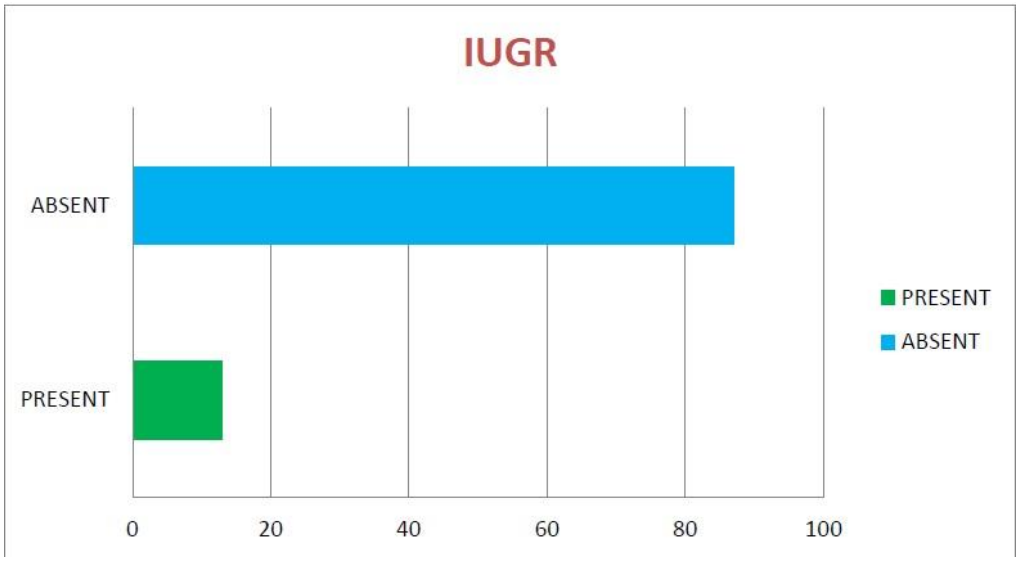


TABLE 2 – URINE OUTPUT

	FREQUENCY	PERCENTAGE
ADEQUATE	86	86
OLIGURIA	14	14
ANURIA	0	0
TOTAL	100	100

TABLE 3 – RENAL FUNCTION TESTS

	FREQUENCY	PERCENTAGE
NORMAL	83	83
ABNORMAL	17	17
TOTAL	100	100

TABLE 4 – DIALYSIS

	FREQUENCY	PERCENTAGE
REQUIRED	16	16
NOT REQUIRED	84	84
TOTAL	100	100

FIGURE 11 – ULTRASONOGRAPHY OF ABDOMEN AND PELVIS

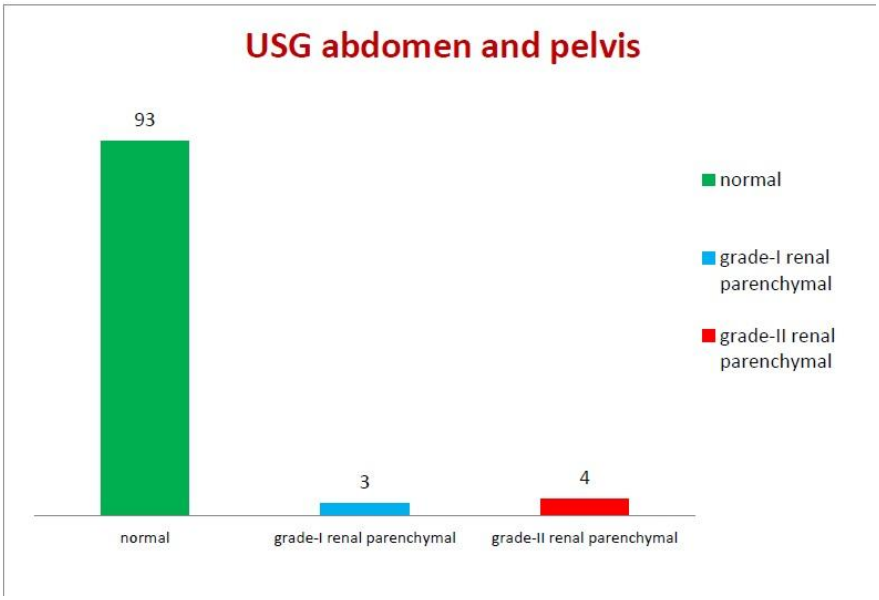


TABLE 5 – FUNDOSCOPY

	FREQUENCY	PERCENTAGE
NORMAL	97	97
GRADE-I	0	0
GRADE-II	0	0
GRADE-III	1	1
GRADE-IV	2	2
TOTAL	100	100

TABLE 6 – ELECTROCARDIOGRAM

	FREQUENCY	PERCENTAGE
NORMAL	99	99
ABNORMAL	1	1
TOTAL	100	100

TABLE 7 – TWO DIMENSIONAL ECHOCARDIOGRAPH

	FREQUENCY	PERCENTAGE
NORMAL	96	96
ABNORMAL	4	4
TOTAL	100	100

TABLE 8 – MRI BRAIN

	FREQUENCY	PERCENTAGE
NORMAL	96	96
PRES	4	4
ISCHEMIC STROKE	1	1
HEMORRAGIC STROKE	1	1
TOTAL	100	100

FIGURE 12 – FETAL DOPPLER

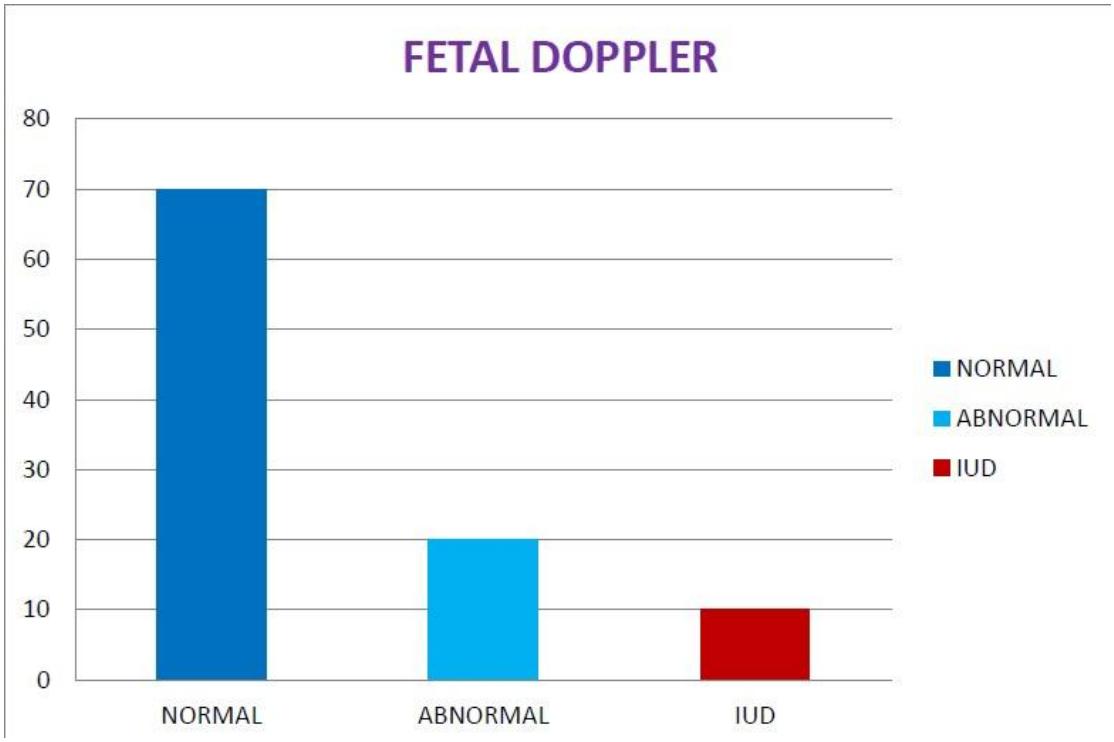


FIGURE 13 – NEONATAL BIRTH WEIGHT

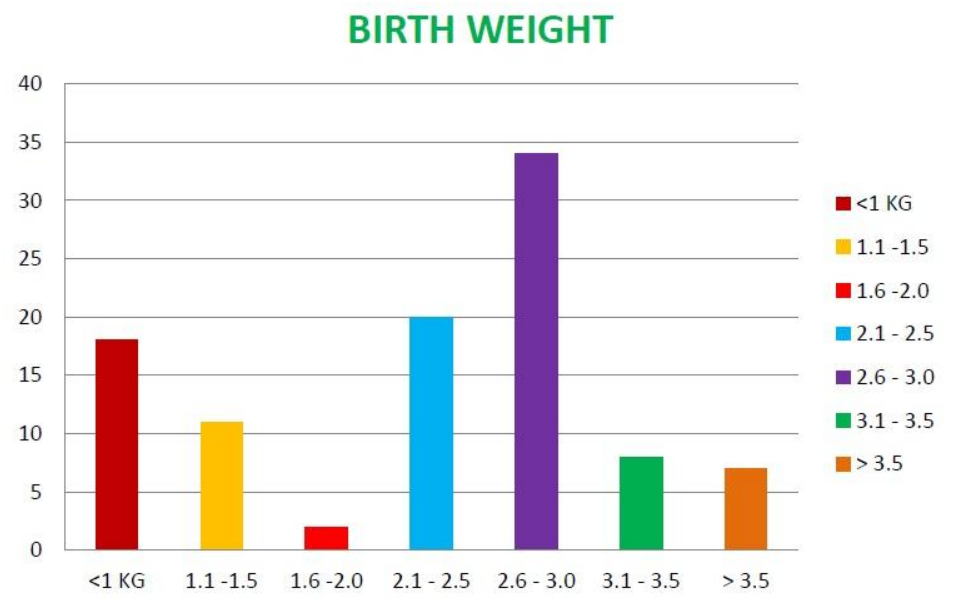


FIGURE 14 – APGAR SCORE

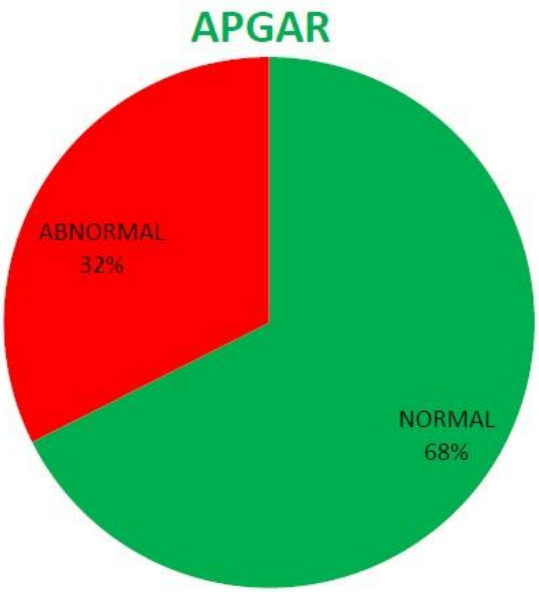
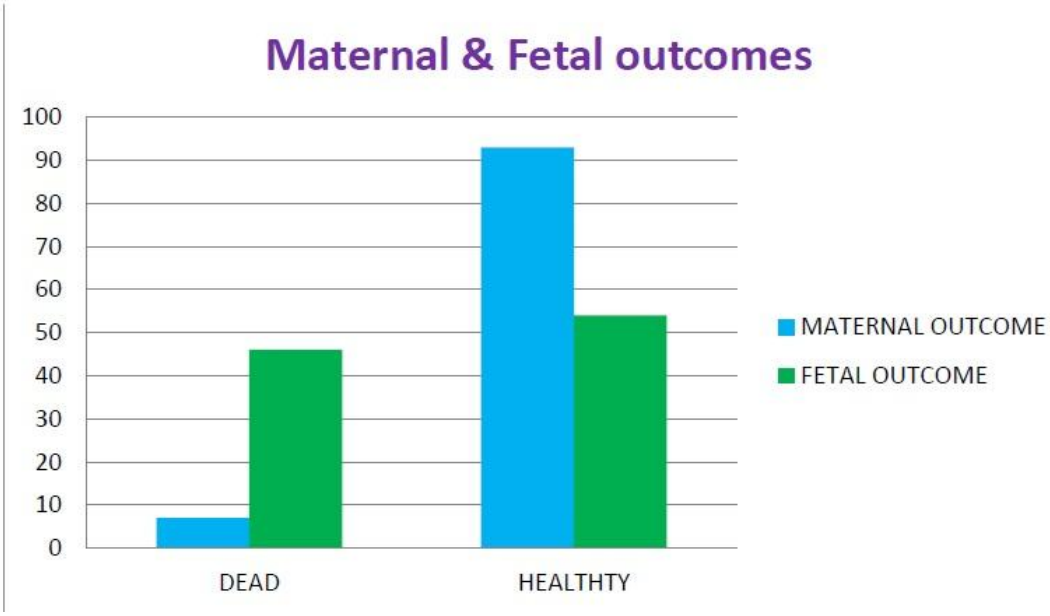


FIGURE 15 – FETAL OUTCOME



STATISTICAL ANALYSIS

1. There is significant association between the HDP and Maternal outcome, ($p<0.05$, Fisher's exact test)
2. There is no significant association between HDP and Fetal outcome, ($P>0.05$, Fisher's exact test)
3. There is significant association between HDP and ECG, ($P<0.05$, Fisher's exact test)
4. There is a significant association between HDP and 2D Echo, ($P<0.05$, Fisher's exact test)
5. There is no significant association between HDP and Fundoscopy, ($P>0.05$, Fisher's exact test)
6. There is significant association between HDP and Urine output, ($P<0.05$, Fisher's exact test)
7. There is a significant association between HDP and RFT, ($P<0.05$, Fisher's exact test
8. There is no significant association between HDP and MRI/CT brain, ($P>0.05$, Fisher's exact test)
9. There is no significant association between HDP and USG abd ($P>0.05$, Fisher's exact test)

V. Discussion

The present study has been conducted in the Dept of Obstetrics and Gynecology, Gandhi Medical College, and General Hospital, Secunderabad, between November 2018 and May 2020.

The present study is a prospective study.

Patients who presented with hypertensive disorder in pregnancy are included in the study after obtaining informed consent. A total of 100 patients have been studied.

AGE:

In our study, 41% are between the age group of 21-25years, which correlates with the studies of Moodley[7] in which the mean age was 25 years. In studies done by Brown MA and Buddle ML[8]**,** D.R.Hall[9]**,** the mean age was 26 years.

BOOKED STATUS

In our study, 76% were unbooked, and 24% were booked cases, which correlates with the study of Sunita[10] T.H et al. 2013, and Pradeep M.R et al.

PARITY:

In our study, 35% are second gravid, and 34% are primi. Brown MA **and** Buddle ML[8] said Pre-eclampsia is predominant in nulliparous.

GA AT DIAGNOSIS:

In our study 34% of patients were above 38wks of gestational age. Eclampsia is common in third trimester.

AUTHOR	GA AT DIAGNOSIS(WEEKS)
D.R.Hall[9]	30
Brown MA and Buddle ML[8]	27

End organ changes

KIDNEY

In our study, 16%(16) of the patients required dialysis;17%(17) had raised serum creatinine 14%(14) Oliguria. In Ultasonogragam of Kidney showing 3% (3) had Grade I renal parenchymal changes, 4%(4) had Grade II renal parenchymal changes. Dr.D.P.Meshram et.,al[11] has reported outcomes according to KDIGO AKI criteria. Maternal death is reported to occur in ≤ 20% of cases of pregnancy-related AKI, with dialysis requirements ranging from 0% to 54.6% with complete renal recovery in 69.4%, 89.4%, and 84.6% and dialysis dependence in 1.2% of cases. These diverse outcomes are likely to reflect different etiologies and definitions of AKI. The high rate of eclampsia within our cohort is in keeping with other published studies of Preeclampsia from South Africa. The high rate of cesarean section is not unexpected as the majority of cases were of preterm Preeclampsia, which is often associated with significant placental dysfunction, which often precludes vaginal delivery.

FUNDOSCOPY

In our study, 3% of patients had fundoscopic changes in which grade III is 1%, and grade IV is 2%.

Tadin et al.[12] from Croatia have reported 45% of retinal changes in their study of 40 patients with PIH. They found a statistical correlation between blood pressure and hypertensive retinopathy. The degree of retinopathy was directly proportional to the severity of Preeclampsia.

CVS

In our study 4% had abnormal 2D ECHO changes.

Raffaelli et al.[13] also showed no association between HR and the cardiac effects of Preeclampsia. It is possible that the increase in HR was not the cause or risk factor but a manifestation of cardiovascular complications. This bias was minimised by using the initial ECG and excluding patients presenting with cardiovascular complications upon admission. The increase in HR is a compensatory mechanism to preserve cardiac output in this population and reflects the severity of Preeclampsia; studies showed the development of left ventricular dysfunction, increased aortic stiffness, and decreased stroke volume. As previously discussed, the incidence of cardiovascular complications is directly proportional to pre-eclampsia severity, and this relation forms the basis of association between HR and cardiovascular complications.

Melchiorre et al[14] observed that more frequently diastolic dysfunction and increased cardiac work and left ventricular mass indices in Preeclampsia suggesting that left ventricular remodeling was an adaptive response to maintain myocardial contractility with Pre-eclampsia at term. Approximately 20% of patients with Pre-eclampsia at term have evident myocardial damage. Diastolic dysfunction usually precedes systolic dysfunction in the evolution of ischemic or hypertensive cardiac diseases and is of prognostic value in the prediction of long-term cardiovascular morbidity.

BRAIN

In our study 4% had PRES;1% had ischaemic stroke ;1% had haemorrhagic stroke. PRES leaves clinical and radiological sequel, even though the syndrome is called "reversible," is still being debated. Among 39 patients with neurologic symptoms, 12 of 13 patients with eclampsia (92.3%) and 5 of 26 patients with Preeclampsia (19.2%) experienced the development of posterior reversible encephalopathy syndrome.

PRESENTING COMPLAINTS

In the study of Dar[15] es Salaam et al 2010, 90% of eclamptic women have prodromal symptoms of which patients with visual disturbance developed seizures within 12 hrs and for other prodromal symptoms, seizures occurred even upto 7 days.

In our study headache was common prodromal symptom in about 90.57% of imminent eclampsia patient and 89.79% of eclampsia patient.

15.09% of imminent eclampsia patient and 16.3% of eclampsia patient had blurring of vision. By prompt identification and management at this imminent state greater number of eclampsia can be prevented.

IUGR

In our study 13% had IUGR and 87% was normal.

APGAR

In our study 32% had low APGAR score.

Sulaeman A Susilo et al[16] which concluded that the APGAR score at 1 and 5th minute were 19% and 5.4% respectively.

BIRTH WEIGHT

In our study showing 34% were in between 2.6-3.0 kg, 20% were 2.1-2.5kg, 18% lessthan 1kg. The mean birth weight was 1.4 kg in the study by D R Hall et al[17].

FETAL OUTCOME

Perinatal Mortality Study	Perinatal Loss
Hall DR[18] 2010	24.0%

In Our study 56% neonates discharged healthy 44% neonatal mortality,10% IUD.

RESPIRATORY DISTRESS

In our study 22% neonates had RDS.

MATERNAL OUTCOME

In our study there was only 7% of Maternal mortality**.**

VI. Conclusions

- The majority of patients are 21-25 years
- Primi and G2 are at high risk of Pre-eclampsia
- The most common presenting complaints are headache, vomiting, blurring of vision, and epigastric pain
- Most of the patients are on a single drug
- The most common type of hypertension is severe Pre-eclampsia
- The most common affected end organ is Kidney
- The neonatal birth weight of most hypertensive mothers are 2.6-3kgs
- 99% of preterm babies were antenatally covered inj.Betamethasone
- Systolic Blood pressure of the majority of the patient at admission is 120-140 mmHg
- Diastolic Blood pressure of the majority of the patient at admission are 90-100mmHg
- Systolic Blood pressure of the majority of the patient at 24hrs are 110-140mmHg
- Diastolic Blood pressure of the majority of the patient at admission are 80-90mmHg
- Systolic Blood pressure of the majority of the patient at discharge are 100-110mmHg
- Diastolic Blood pressure of the majority of the patient at discharge are 60-70mmHg
- 52% of them are preterm pregnancy
- There is a significant association between the HDP and Maternal outcome
- There is not a significant association between HDP and Fetal outcome
- There is a significant association between HDP and 2D Echo
- There is a significant association between HDP and RFT
- There is a significant association between HDP and Dialysis
- There is a significant association between HDP and USG abdomen

VII. Summary

The clinical profile of patients with hypertensive disorders in pregnancy presenting to hospitals in a developing country like ours is poorly known.

The present study is a prospective study done at Gandhi Medical College hospital, secunderabad, over a period of one and a half years. The study population included patients admitted to this hospital with blood pressure in pregnancy with clinical or laboratory evidence of acute target organ damage. The clinical and

laboratory profile of 100 of these patients were evaluated. The commonest age group was 21-25years and most of them are unbooked cases.

The majority of them had severe preeclampsia, which was also seen in other similar studies. Higher levels of blood pressure at presentation were associated with an adverse outcome. Kidney was the commonest target organ damage observed. In-Hospital mortality of 7% was observed in the present study.

References

[1]. Sadhukhan SK, Khan S. Blood pressure awareness among general population: a rural West Bengal experience with logistic regression. Natl J Med Res. 2012;2(1):55-8.

[2]. Ronsmans C, Graham WJ, Lancet Maternal Survival Series steering group. Maternal mortality: who, when, where, and why. The lancet. 2006 Sep 30;368(9542):1189-200.

[3]. Spong CY, Mercer BM, D'Alton M, Kilpatrick S, Blackwell S, Saade G. Timing of indicated late-preterm and early-term birth. Obstetrics and gynecology. 2011 Aug;118(2 Pt 1):323.

[4]. Schiff E, Friedman SA, Mercer BM, Sibai BM. Fetal lung maturity is not accelerated in preeclamptic pregnancies. American journal of obstetrics and gynecology. 1993 Nov 1;169(5):1096-101.

[5]. Cudihy D, Lee RV. The pathophysiology of Pre-eclampsia: current clinical concepts. Journal of Obstetrics and Gynaecology. 2009 Jan 1;29(7):576-82.

[6]. Brosens I, Brosens JJ, Muter J, Puttemans P, Benagiano G. Preeclampsia: the role of persistent endothelial cells in uteroplacental arteries. American journal of obstetrics and gynecology. 2019 Sep 1;221(3):219-26

[7]. Gathiram P, Moodley JJ. Pre-eclampsia: its pathogenesis and pathophysiolgy. Cardiovascular journal of Africa. 2016 Mar;27(2):71.

[8]. Brown MA, Buddle ML. Hypertension in pregnancy: maternal and fetal outcomes according to laboratory and clinical features. The medical journal of Australia. 1999 Sep 9;165(7):360-5.

[9]. Kenneth L, Hall DR, Gebhardt S, Grove D. Late onset pre-eclampsia is not an innocuous condition. Hypertension in pregnancy. 2010 Aug 1;29(3):262-7.

[10]. Sowmya S, Ramaiah A, Sunitha T, Nallari P, Jyothy A, Venkateshwari A. Evaluation of interleukin-10 (G-1082A) promoter polymorphism in Preeclampsia. Journal of reproduction & infertility. 2013 Apr;14(2):62.

[11]. Meshram DP, Chavan YH, Kadam PN, Panchal MG, Ramteke DJ. Maternal and foetal outcomes in Pregnancy Induced Hypertension-A hospital based study. International journal of pharmaceutical science invention. 2014 Apr;3(4):23-6.

[12]. Tadin I, Bojić L, Mimica M, Karelović D, Đogaš Z. Hypertensive retinopathy and Pre-eclampsia. Collegium antropologicum. 2001 Jul 23;25(1):77-81.

[13]. Farina A, Hasegawa J, Raffaelli S, Ceccarini C, Rapacchia G, Pittalis MC, Brondelli L, Righetti F, Rizzo N. The association between Preeclampsia and placental disruption induced by chorionic villous sampling. Prenatal diagnosis. 2010 Jun;30(6):571-4.

[14]. Melchiorre K, Thilaganathan B. Maternal cardiac function in Preeclampsia. Current Opinion in Obstetrics and Gynecology. 2011 Dec 1;23(6):440-7.

[15]. Maembe LE. Management of pre-eclampsia/eclampsia in dar es salaam public health facilities: availability of supplies and knowledge of healthcare workers (Doctoral dissertation, Muhimbili University of Health and Allied Sciences.).

[16]. Susilo SA, Pratiwi KN, Fattah AN, Irwinda R, Wibowo N. Determinants of low APGAR score among preeclamptic deliveries in Cipto Mangunkusumo Hospital: a retrospective cohort study in 2014. Medical Journal of Indonesia. 2015 Nov 9;24(3):183-9.

[17]. Van der Merwe JL, Hall DR, Wright C, Schubert P, Grove D. Are early and late Preeclampsia distinct subclasses of the disease—what does the placenta reveal?. Hypertension in pregnancy. 2010 Nov 1;29(4):457-67.

Dr.Jyothirmayi Bangari, et. al. "Prospective Study of End Organ Changes In Hypertensive Disorders in Pregnancy and Fetomaternal Outcomes in Gandhi Hospital.'' *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(09), 2021, pp. 37-50.