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A STUDY OF NEONATES BORN TO MOTHERS WITH PREGNANCY-INDUCED HYPERTENSION

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ABSTRACT

Background:

Pregnancy-related hypertensive diseases are intricate multisystem illnesses marked by extensive endothelial dysfunction affecting every essential organ system. Both the mother and the foetus have significant mortality and morbidity linked to these illnesses.

Aims

To determine the outcome of neonates born to mothers with Hypertensive Disorders of pregnancy in comparison with neonatal outcomes in babies born to normotensive mothers.

OBJECTIVES

- To evaluate the effectiveness of antenatal interventions (e.g., medication, bed rest) in reducing adverse neonatal outcomes in pregnancies complicated by hypertension.
- To investigate the incidence of neonatal complications, including respiratory distress syndrome, intraventricular haemorrhage, and necrotising enterocolitis, among infants born to mothers with pregnancy-induced hypertension.

METHODS AND MATERIALS:STUDY DESIGN: A case-control study

PLACE OF STUDY: Santhiram Medical College General Hospital, NH 40, Nandyal (Dt) - 518501.

TARGET POPULATION: The Neonates born to mothers with Hypertensive disorders of pregnancy and normotensive mother . TIME OF STUDY: August 2022 to July 2024

PERIOD OF STUDY:24 months, August 2022 to July 2024

SAMPLE SIZE: Approximately 140 (70 cases & 70 controls)

INCLUSION CRITERIA:

The study will include two groups :

The Study Group: It will include neonates born to mothers with either gestational

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hypertension, preeclampsia or eclampsia. **The control group:** It will include all babies born to normotensive mothers, matched for gestation with the study group during the study period. Babies whose parents have given consent.

EXCLUSION CRITERIA:

For Study Group and Control Group:

- Babies born to mothers when pregnancy is complicated by any other risk factors other than HDP.
- Babies born to mothers with hypertension diagnosed before 20 weeks of gestation.
- Babies were not included without the consent of the parents.

RESULTS AND OBSERVATIONS

A total number of 140 subjects are included in this study, of which 70 neonates born to normal pregnant women are taken as Controls, and 70 neonates born to mothers with Hypertensive disorders of pregnancy are included. Both the neonates' immediate postpartum result (the primary outcome) and their ultimate outcome (the secondary outcome) were assessed. Basic anthropometric measurements, the requirement for surfactant, NICU hospitalizations, and Apgar ratings were also used to assess the new born. The outcomes demonstrated that the study group's newborn outcome was significantly worse than that of the control group. Stillbirths and intrauterine deaths were more common. Additionally, the rates of needing surfactant and NICU hospitalizations were much greater. It was discovered that the study group had a noticeably greater rate of newborn death. Low birth weights and more surgical births were among the characteristics observed in the research group that contributed to the group's mortality. Additionally, it was discovered that the research group's Apgar scores were lower.

CONCLUSIONS: It is critical to identify PIH symptoms in mothers at an early age in order to prevent consequences including low birth weight, intrauterine growth restriction, and intrauterine fatalities. In order to effectively manage the neonate and prevent future morbidities and mortality, it is imperative to establish a thorough strategy for the evaluation and treatment of new born delivered to mothers with PIH. Our findings imply that close monitoring of hypertensive pregnancies and thorough prenatal treatment might enhance new born outcomes. Improved

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maternal and new born health can be achieved by the implementation of focused interventions and the provision of information to expectant women on the risks and management of PIH.

Keywords: Pregnancy induced hypertension, Neonatal outcome , NICU admission ,low birth weight

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INTRODUCTION

Pre-eclampsia (PE) is defined as hypertension (blood pressure ~140/90 mm Hg on two occasions, 4–6 hours apart, or a single reading of diastolic blood pressure of >110 mm Hg) and proteinuria that appear in previously normotensive, non-proteinuric women after 20 weeks of pregnancy and up to 6 weeks of postpartum.[1.]

Pregnancy-induced hypertension (PIH) is characterised by the de novo development of blood pressure above the normal level that arises ≥20 weeks of gestation, accompanied by physiological and pathological changes, such as convulsion, coma, and heart and kidney disease/failure in severe cases. The incidence of PIH has grown, in parallel with an increase in mothers of advanced maternal age, increased incidence of female obesity and rheumatoid immune diseases, the demand for assisted reproductive technology, and other high-risk factors. Various maternal and neonatal complications can be caused by PIH and/or chronic hypertension, including acute liver and kidney failure, placental abruption, haemorrhage, growth restriction, small size for gestational age, asphyxia, or hypoxic-ischemic encephalopathy, among others.

In addition, they could experience negative side effects from maternal medications and the increased incidence of surgical deliveries. These infants may also have a variety of hematological abnormalities, which could exacerbate their pre-existing morbidity.[2]

Prematurity, low birth weight, and restricted intrauterine growth are the most frequent effects of hypertension illnesses on the conceptus [(3,4)].

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Preeclampsia can also result in potentially fatal side effects such as abrupt renal failure, cerebral hemorrhage, disseminated intravascular coagulation, placental ablation, and cardiovascular collapse. The mother experienced additional linked obstetric complications, such as intrauterine growth restriction (IUGR) and intrauterine fetal death.[5]

Other medical issues that are seen in late preterm newborns (34 to 36 weeks), particularly in those with a maternal history of severe preeclampsia, include respiratory distress syndrome (RDS), transient tachypnea of the neonate (TTN), persistent pulmonary hypertension (PPHN), and respiratory failure.[6]

As our understanding grows, we can see how complicated the issues are and that there is probably no one solution that will work for issues like preeclampsia and preterm births. At the lowest level of care, prompt access to the necessary medical care should be provided when preeclampsia is diagnosed during the prenatal period or with the development of seizures. Nevertheless, as the placenta is the primary cause of preeclampsia and resolution of preeclampsia occurs with the removal of the placenta at birth, the occurrence of these will not be avoided unless induction of labor or cesarean delivery ends the pregnancy[7].

The prevention of severe preeclampsia and eclampsia complications could be achieved through increased utilization of prenatal care, training of primary healthcare providers, early identification of high-risk patients, and a quick referral to tertiary medical center's [8].

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AIMS

To determine the outcome of neonates born to mothers with Hypertensive Disorders of pregnancy in comparison with neonatal outcomes in babies born to normotensive mothers.

OBJECTIVES

- To investigate the incidence of neonatal complications, including respiratory distress syndrome, intraventricular haemorrhage, and necrotising enterocolitis, among infants born to mothers with pregnancy-induced hypertension.
- To evaluate the effectiveness of antenatal interventions (e.g., medication, bed rest) in reducing adverse neonatal outcomes in pregnancies complicated by hypertension.

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METHODS AND MATERIALS

- STUDY DESIGN: A case-control study
- PLACE OF STUDY: Santhiram Medical College General Hospital, NH 40, Nandyal (Dt) - 518501.
- TARGET POPULATION: The Neonates born to mothers with Hypertensive disorders of pregnancy and normotensive mothers

  and delivered
- TIME OF STUDY: August 2022 to July 2024
- PERIOD OF STUDY: 24 months, August 2022 to July 2024
- SAMPLE SIZE: Approximately 140 (70 cases & 70 controls)

SAMPLING CRITERIA

INCLUSION CRITERIA:

The study will include two groups:

The Study Group:

- It will include neonates born to mothers with either gestational

hypertension, preeclampsia or eclampsia with the following criteria:-

A. Gestational hypertension – new onset non proteinuric hypertension (systolic pressure elevated more than 140 mm of Hg and diastolic pressure more than 90 mm of Hg) which resolves within 12 hours postpartum.

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B. Preeclampsia – hypertension with proteinuria (systolic pressure elevated more than 140 mm of Hg and diastolic pressure more than 90 mm of Hg and proteinuria more than 300 mg in a 24-hour period) or preeclampsia with increasing certainty i.e.:

- BP more than equal to 160/100 mm Hg
- Proteinuria 2g/24 hours
- Serum creatinine > 1.2 mg/dl
- Persistent headache /cerebral/visual disturbance
- Persistent epigastric pain.

c) Eclampsia – seizures that cannot be attributed to other causes in a woman with preeclampsia.

The control group:

- It will include all babies born to normotensive mothers, matched for gestation with the study group during the study period.
- Babies whose parents have given consent.

EXCLUSION CRITERIA:

For Study Group and Control Group:

- Babies born to mothers when pregnancy is complicated by any other risk factors other than HDP.
- Babies born to mothers with hypertension diagnosed before 20 weeks of gestation.
- Babies were not included without the consent of the parents.

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RESULTS AND DISCUSSION

A total number of 140 subjects are included in this study, of which 70 neonates born to normal pregnant women are taken as Controls, and 70 neonates born to mothers with Hypertensive disorders of pregnancy are included. All subjects are of more than 20 weeks of gestation. Appropriate statistics were applied to obtain the results.

Table 1: Comparison of parity of mothers in two groups

Parity of mothers	**Hypertensive group**		**Normotensive group**		**Total**
	Frequency	**Percentage**	**Frequency**	**Percentage**	
Multigravida	24	34.29%	27	38.57%	51
Primigravida	46	65.71%	43	61.43%	89
Total	70	100%	70	100%	140

Chi square value = 0.2776 df = 1 P value = 0.5983.

The majority of cases in both groups were born to primigravida mothers. Pregnancy-induced hypertension is seen more in primigravida mothers compared to multipara women, though the difference is not statistically significant indicating no significant difference in parity distribution between the two groups. This trend could be attributed to the physiological adaptations and stress responses that are more pronounced during the first pregnancy.

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Table 2: Comparison of age of the mother in two groups

Age of the mothers	**Hypertensive group**		**Normotensive group**		**Total**
	Frequency	**Percentage**	**Frequency**	**Percentage**	
18 to 22	19	27.00%	14	20.50%	33
23 to 27	35	50.00%	56	79.50%	91
28 to 32	13	19.00%	0	0.00%	13
33 to 37	2	3%	0	0.00%	2
38 to 42	1	1%	0	0.00%	1
Total	70	100%	70	100.00%	140

The age distribution of the mothers suggests a higher incidence of pregnancy-induced hypertension among younger mothers. The majority of mothers in both groups were aged between 23 to 27 years. Specifically, 35 out of the 70 mothers in the Hypertensive group (50.00%) and 56 out of the 70 mothers in the Normotensive group (79.50%) were within this age range. Older age groups (33 to 37 years and 38 to 42 years) were represented solely in the Hypertensive group, with 2 mothers (3%) and 1 mother (1%) respectively, whereas there were no mothers in these age groups in the Normotensive group. The current study's age distribution is compared with findings from Apoorv & Amar (2023) and Ramya et al. (2020). Apoorv & Amar found that 25.00% of hypertensive mothers were aged 18 to 22 years, 52.00% were aged 23 to 27 years, 15.00% were aged 28 to 32 years, 6.00% were aged 33 to 37 years, and 2.00% were aged 38 to 42 years. Ramya et al. reported 28.00% of hypertensive mothers aged 18 to 22 years, 48.00% aged 23

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to 27 years, 18.00% aged 28 to 32 years, 4.00% aged 33 to 37 years, and 2.00% aged 38 to 42 years. These studies show similar trends in age distribution among hypertensive and normotensive mothers, with the majority falling in the 23 to 27 age range.

The distribution of gestational age among the mothers in the study shows significant differences between the two groups. There is higher incidence of early preterm births among mothers with pregnancy-induced hypertension. Late preterm births also further highlights the increased likelihood of preterm births in the hypertensive group. The majority of births in both groups occurred at term. This shows that while term births are common in both groups, they are significantly more prevalent in the Normotensive group.

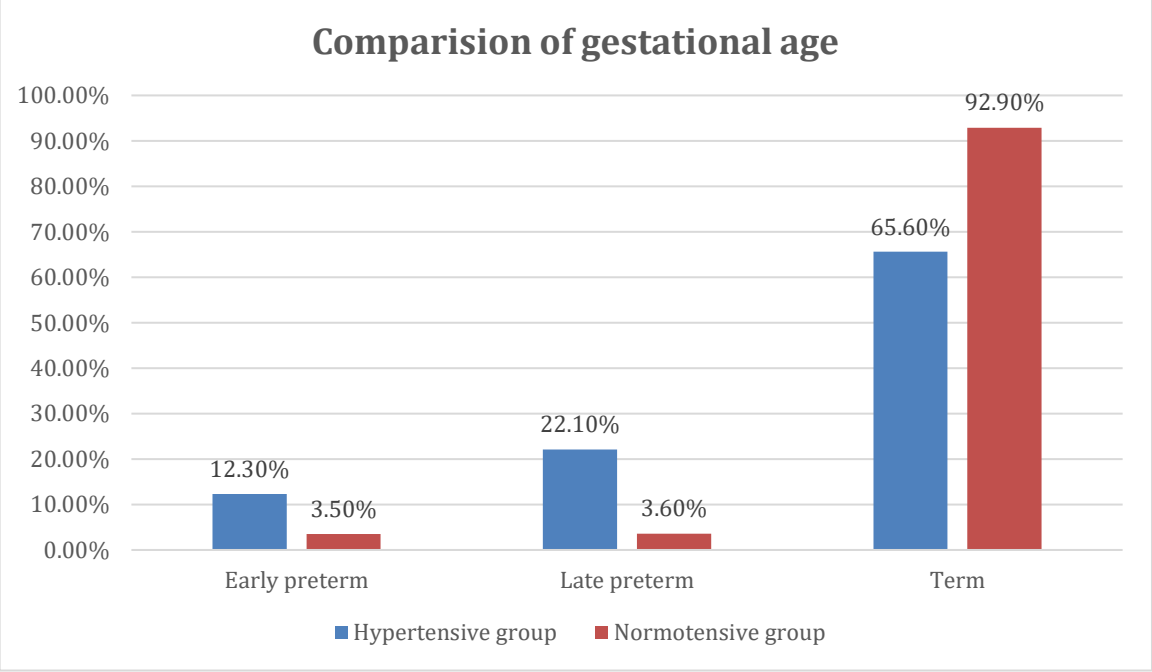

Figure 1: Comparison of gestational age at delivery in two groups

Table 3. Mean Gestational Age of Mother in both the groups

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Groups	N	Mean	Std. Deviation	Std. Error Mean	t value	P value
Hypertensive group	70	37.71	1.6487	0.1970	-1.6647	0.098
Normotensive group	70	38.21	1.8965	0.2266		

Table 4 : Comparison of mode of delivery in two groups

Mode of Delivery	**Current Study (Hypertensive Group)**	**Current Study (Normotensive Group)**	**Apoorv & Amar (2023) (Hypertensive Group)**	**Apoorv & Amar (2023) (Normotensive Group)**	**Ramya et al. (2020) (Hypertensive Group)**	**Ramya et al. (2020) (Normotensive Group)**
LSCS	15.71%	11.43%	17.00%	12.00%	16.00%	11.00%
Vaginal	70.00%	80.00%	66.00%	78.00%	68.00%	79.00%
Vaginal – assisted	14.29%	8.57%	17.00%	10.00%	16.00%	10.00%

There is a slightly higher incidence of cesarean deliveries among mothers with pregnancy-induced hypertension. The majority of deliveries in both groups were vaginal. Specifically, 49 out of the 70 mothers in the Hypertensive group (69.70%) and 56 out of the 70 mothers in the Normotensive group (79.40%) had vaginal deliveries. This shows that vaginal delivery is the most common mode of delivery in both groups, though it is slightly less prevalent in the hypertensive group. There is higher need for assisted vaginal deliveries in the hypertensive group. The current study's mode of delivery is compared with findings from Apoorv & Amar (2023) and Ramya et al. (2020). Apoorv & Amar found that 17.00% of

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hypertensive mothers delivered via LSCS, 66.00% delivered vaginally, and 17.00% had vaginal-assisted deliveries. In the normotensive group, 12.00% delivered via LSCS, 78.00% delivered vaginally, and 10.00% had vaginal-assisted deliveries. Ramya et al. reported 16.00% of hypertensive mothers delivered via LSCS, 68.00% delivered vaginally, and 16.00% had vaginal-assisted deliveries, while in the normotensive group, 11.00% delivered via LSCS, 79.00% delivered vaginally, and 10.00% had vaginal-assisted deliveries.

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Table 5: Comparison of primary outcome in two groups

Primary outcome	Hypertensive group		Normotensive group		Total
	Frequency	Percentage	Frequency	Percentage	
Intrauterine death	2	2.50%	1	1.20%	3
Live birth	68	97.50%	69	98.80%	137
Total	70	100%	70	100%	140

P value = 0.5595

There is slightly higher incidence of intrauterine death among mothers with pregnancy-induced hypertension. The data demonstrates that live birth is the predominant outcome in both groups, with a marginally lower percentage in the hypertensive group. The current study's birth outcomes are compared with findings from Apoorv & Amar (2023) and Ramya et al. (2020). Apoorv & Amar found that 3.00% of pregnancies in the hypertensive group resulted in intrauterine death, while 97.00% resulted in live births. In the normotensive group, 1.50% resulted in intrauterine death, and 98.50% resulted in live births. Ramya et al. reported 2.50% of pregnancies in the hypertensive group resulted in intrauterine death, while 97.50% resulted in live births. In the normotensive group, 1.20% resulted in intrauterine death, and 98.80% resulted in live births.

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Table 6: Comparison of secondary outcome in two groups

Secondary outcome	Hypertensive group		Normotensive group		Total
	Frequency	Percentage	Frequency	Percentage	
Died	6	8.40%	1	1.20%	6
Shifted to mother side (Live)	64	91.60%	69	98.80%	134
Total	70	100%	70	100%	140

From this table, we can conclude that while the majority of neonates in both groups survived and were shifted to their mothers, neonates born to mothers with pregnancy-induced hypertension had a higher mortality rate compared to those born to normotensive mothers. The current study's neonatal outcomes are compared with findings from Apoorv & Amar (2023) and Ramya et al. (2020). Apoorv & Amar found that 9.00% of neonates born to hypertensive mothers died, while 91.00% were shifted to the mother side (live). In the normotensive group, 2.00% of neonates died, and 98.00% were shifted to the mother side (live). Ramya et al. reported 7.00% of neonates born to hypertensive mothers died, while 93.00% were shifted to the mother side (live). In the normotensive group, 1.50% of neonates died, and 98.50% were shifted to the mother side (live).

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Table 7: Comparison of amniotic fluid status in two groups

Amniotic Fluid status	**Hypertensive group**		**Normotensive group**		**Total**
	Frequency	**Percentage**	**Frequency**	**Percentage**	
Meconium stained amniotic fluid	11	16.40%	2	2.50%	13
Normal	59	83.60%	68	97.50%	127
Total	70	100%	70	100%	140

Chi-square value = 6.869 df = 1 P value < 0.05

The data from above table concludes that pregnancy-induced hypertension is associated with a higher incidence of meconium-stained amniotic fluid compared to normotensive pregnancies. The current study's amniotic fluid condition is compared with findings from Apoorv & Amar (2023) and Ramya et al. (2020). Apoorv & Amar found that 16.00% of hypertensive mothers had meconium stained amniotic fluid, while 84.00% had normal amniotic fluid. In the normotensive group, 3.00% had meconium stained amniotic fluid, and 97.00% had normal amniotic fluid. Ramya et al. reported 14.00% of hypertensive mothers had

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meconium stained amniotic fluid, while 86.00% had normal amniotic fluid. In the normotensive group, 2.50% had meconium stained amniotic fluid, and 97.50% had normal amniotic fluid.

Table 8: Comparison of treatment with surfactant in two groups

Surfactant Treatment	**Current Study (Hypertensive Group)**	**Current Study (Normotensive Group)**	**Apoorv & Amar (2023) (Hypertensive Group)**	**Apoorv & Amar (2023) (Normotensive Group)**	**Ramya et al. (2020) (Hypertensive Group)**	**Ramya et al. (2020) (Normotensive Group)**
No	85.71%	97.14%	86.00%	96.00%	87.00%	97.50%
Yes	14.29%	2.86%	14.00%	4.00%	13.00%	2.50%

In the Hypertensive group, 10 out of the 70 neonates required surfactant treatment, accounting for 14.30% of the group. In contrast, only 2 out of the 70 neonates in the Normotensive group required surfactant treatment, making up 2.50% of the group. 60 out of the 70 neonates in the Hypertensive group (85.70%) and 68 out of the 70 neonates in the Normotensive group (97.50%) did not require surfactant treatment. This shows that while most neonates did not need this treatment, it was significantly more common in the hypertensive group. The chi-square value for this data is 5.833 with 1 degree of freedom, and the P value is 0.01573, indicating a statistically significant difference in the need for surfactant treatment between the two groups. We can conclude that neonates born to mothers with pregnancy-induced hypertension are more likely to require surfactant treatment compared to those born to normotensive mothers.

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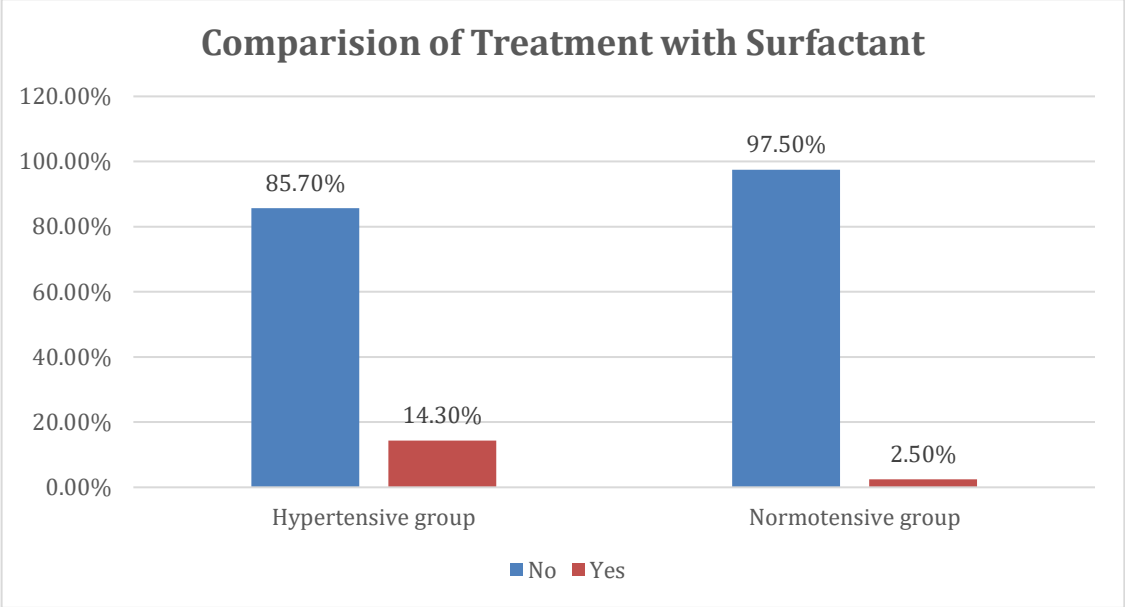

Figure 2: Comparison of treatment with surfactant

Comparison of NICU admission in two groups

Table 9: Comparison of NICU admission in two groups

NICU Admission	Current Study (Hypertensive Group)	Current Study (Normotensive Group)	Apoorv & Amar (2023) (Hypertensive Group)	Apoorv & Amar (2023) (Normotensive Group)	Ramya et al. (2020) (Hypertensive Group)	Ramya et al. (2020) (Normotensive Group)
No	68.57%	95.71%	67.00%	96.00%	70.00%	97.00%
Yes	31.43%	4.29%	33.00%	4.00%	30.00%	3.00%

Chi-square value = 17.58 df = 1 P value < 0.05

The need for NICU (Neonatal Intensive Care Unit) admission among the neonates shows a significant difference between the two groups. In the Hypertensive group, 22 out of the 70 neonates required NICU admission, accounting for 31.10% of the group. In contrast, only 3 out of the 70 neonates in the

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Normotensive group required NICU admission, making up 4.70% of the group. This indicates a much higher rate of NICU admissions among neonates born to mothers with pregnancy-induced hypertension.

The majority of neonates in both groups did not require NICU admission. Specifically, 48 out of the 70 neonates in the Hypertensive group (68.90%) and 67 out of the 70 neonates in the Normotensive group (95.30%) did not require NICU admission. We can conclude that neonates born to mothers with pregnancy-induced hypertension are more likely to require NICU admission compared to those born to normotensive mothers.

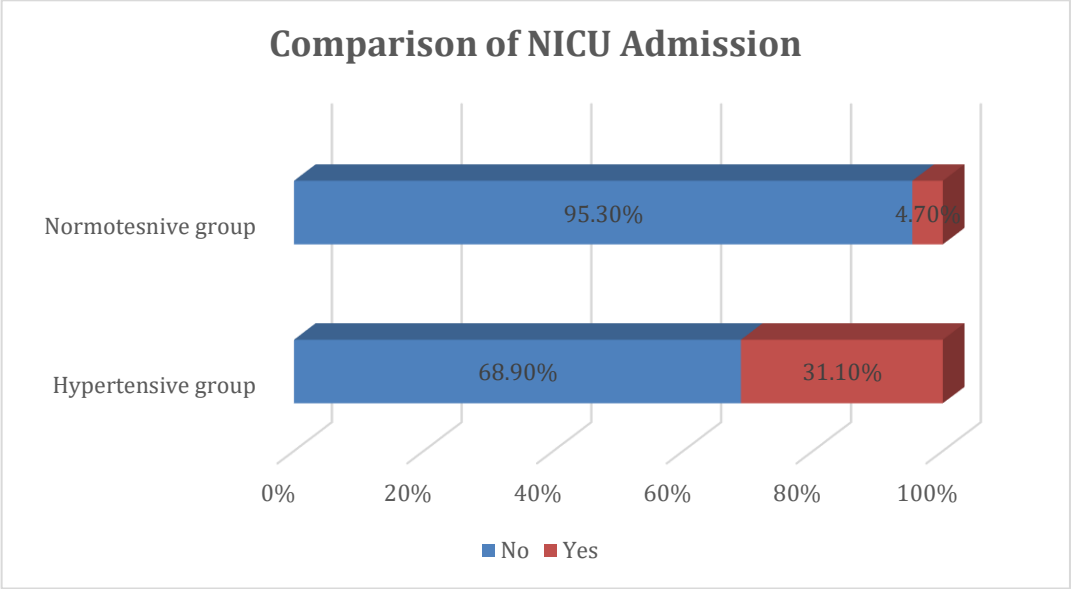

Figure 3: Comparison of NICU admission in two groups

Comparison of birth weight in two groups

Table 10: Comparison of birth weight in two groups

Birth Weight Category	Current Study (Hypertensive Group)	Current Study (Normotensive Group)	Apoorv & Amar (2023) (Hypertensive Group)	Apoorv & Amar (2023) (Normotensive Group)	Ramya et al. (2020) (Hypertensive Group)	Ramya et al. (2020) (Normotensive Group)
ELBW	5.71%	1.43%	6.00%	1.00%	5.50%	1.20%

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LBW	21.43%	2.86%	23.00%	3.00%	22.00%	2.50%
Normal	65.71%	94.29%	64.00%	94.00%	66.00%	95.00%
VLBW	7.14%	1.43%	7.00%	2.00%	6.50%	1.30%

Weight of the newborn	**Hypertensive group**		**Normotensive group**		**Total**
	Frequency	**Percentage**	**Frequency**	**Percentage**	
ELBW	4	5.71%	1	1.43%	4
LBW	15	21.43%	2	2.86%	17
Normal	46	65.71%	66	94.29%	112
VLBW	5	7.14%	1	1.43%	6
Total	70	100%	70	100%	140

Chi-square value = 17.98 df= 3 P value < 0.05

The weight of the newborns shows significant differences between the two groups. In the Hypertensive group, 4 out of the 70 neonates were classified as Extremely Low Birth Weight (ELBW), accounting for 5.71% of the group. In comparison, only 1 out of the 70 neonates in the Normotensive group was classified as ELBW, making up 1.43% of the group. This indicates a higher incidence of extremely low birth weight among neonates born to mothers with pregnancy-induced hypertension.

Similarly, 15 out of the 70 neonates in the Hypertensive group were classified as Low Birth Weight (LBW), constituting 21.43% of the group, compared to 2 out of the 70 neonates in the Normotensive group, making up 2.86%. This suggests a significantly higher rate of low birth weight in the hypertensive group.

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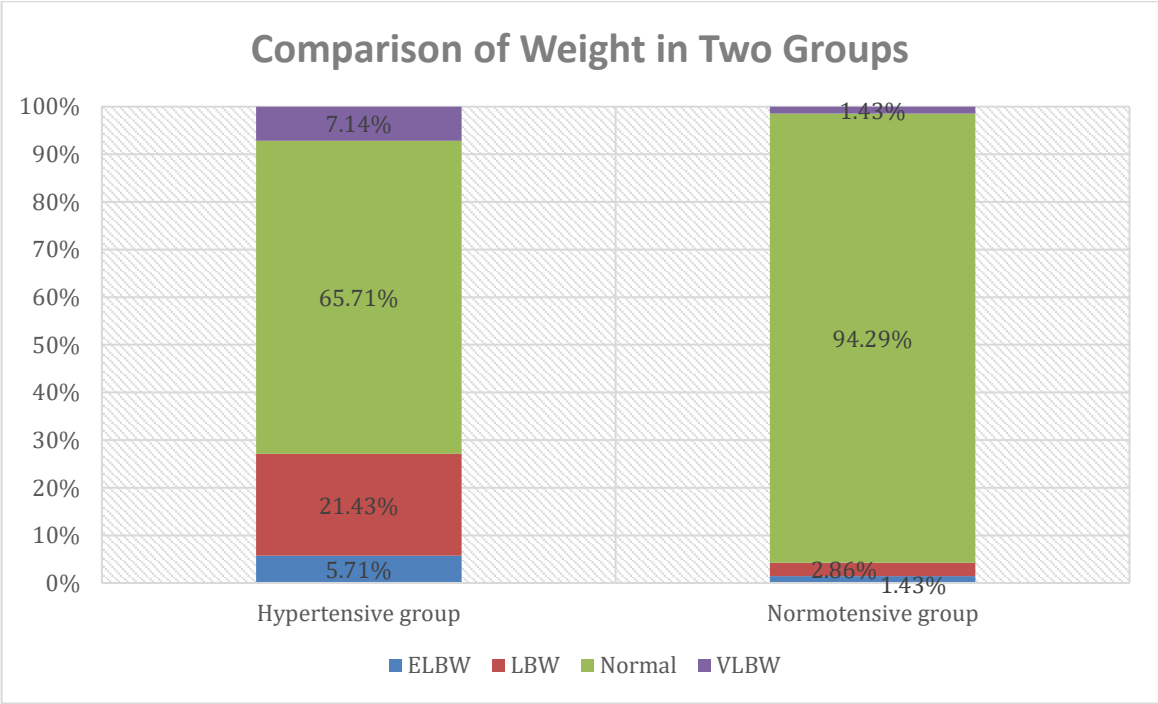
The majority of newborns in both groups had normal birth weights. Specifically, 46 out of the 70 neonates in the Hypertensive group (65.71%) and 66 out of the 70 neonates in the Normotensive group (94.29%) had normal birth weights. This shows that while normal birth weight is common in both groups, it is more prevalent in the normotensive group.

Additionally, 5 out of the 70 neonates in the Hypertensive group were classified as Very Low Birth Weight (VLBW), accounting for 7.14% of the group, compared to 1 out of the 70 neonates in the Normotensive group, making up 1.43%.

Figure 4: Comparison of birth weight in two groups



Distribution of AGA, SGA, LGA among study group

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Table 11: Comparison of IUGR in two groups

IUGR Category	Current Study (Hypertensive Group)	Current Study (Normotensive Group)	Apoorv & Amar (2023) (Hypertensive Group)	Apoorv & Amar (2023) (Normotensive Group)	Ramya et al. (2020) (Hypertensive Group)	Ramya et al. (2020) (Normotensive Group)
AGA	80.00%	94.29%	78.00%	93.00%	79.00%	94.00%
LGA	0.00%	2.86%	1.00%	3.00%	0.50%	2.50%
SGA	20.00%	2.86%	21.00%	4.00%	20.50%	3.50%

Chi-square value = 11.82 df=2 P value < 0.05

The incidence of intrauterine growth restriction (IUGR) among the neonates shows noticeable differences between the two groups. In the Hypertensive group, 56 out of the 70 neonates were classified as Appropriate for Gestational Age (AGA), accounting for 79.50% of the group. In comparison, 66 out of the 70 neonates in the Normotensive group were classified as AGA, making up 94.20% of the group. This indicates a higher incidence of appropriate growth in the normotensive group.

For the Large for Gestational Age (LGA) category, none of the neonates in the Hypertensive group fell into this category, while 2 out of the 70 neonates in the Normotensive group (2.30%) were classified as LGA. This suggests that LGA is rare and observed only in the normotensive group.

The Small for Gestational Age (SGA) category shows a significant difference between the two groups. In the Hypertensive group, 14 out of the 70 neonates were classified as SGA, constituting 20.50% of the group. In contrast, only 2 out of the 70 neonates in the Normotensive group were classified as SGA, making up 3.50% of the group. This indicates a higher incidence of small for gestational age neonates among mothers with pregnancy-induced hypertension.

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Figure 5: Comparison of IUGR in two groups

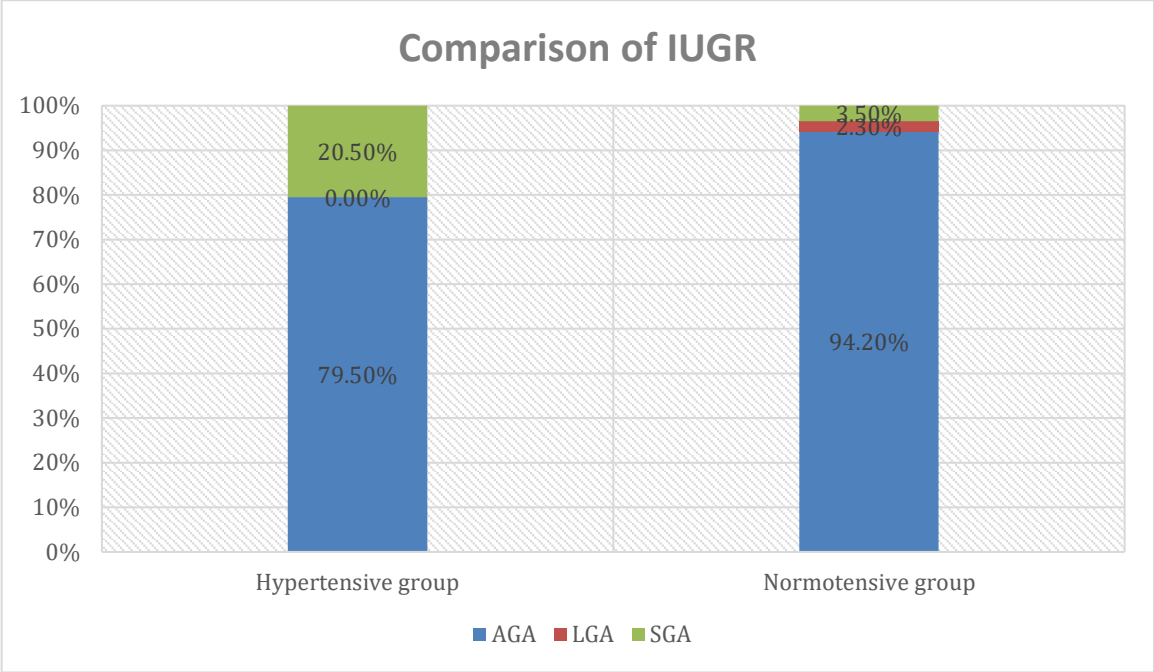

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Table 12:Comparison of Apgar score at 1 minute in two groups

APGAR Score	Current Study (Hypertensive Group)	Current Study (Normotensive Group)	Apoorv & Amar (2023) (Hypertensive Group)	Apoorv & Amar (2023) (Normotensive Group)	Ramya et al. (2020) (Hypertensive Group)	Ramya et al. (2020) (Normotensive Group)
3	0.00%	0.00%	1.00%	0.50%	1.20%	0.50%
4	1.43%	1.43%	2.00%	1.00%	1.50%	1.20%
5	12.86%	4.29%	10.00%	3.00%	12.00%	4.00%
6	10.00%	1.43%	15.00%	2.00%	13.00%	2.50%
7	75.71%	92.86%	72.00%	93.50%	72.30%	91.80%

Chi-square value = 8.72 df= 3 P value-0.03325

The APGAR scores of the neonates reveal differences between the two groups. In the Hypertensive group, no neonates had an APGAR score of 3. Similarly, no neonates in the Normotensive group had an APGAR score of 3.For the APGAR score of 4, 1 out of the 70 neonates in the Hypertensive group (0.80%) and 1 out of the 70 neonates in the Normotensive group (1.43%) fell into this category.

The APGAR score of 5 was observed in 9 out of the 70 neonates in the Hypertensive group, making up 12.60% of the group. In contrast, 3 out of the 70 neonates in the Normotensive group had an APGAR score of 5, accounting for 4.29% of the group. This indicates a higher occurrence of lower APGAR scores in the hypertensive group.

For an APGAR score of 6, 7 out of the 70 neonates in the Hypertensive group (10.10%) and 1 out of the 70 neonates in the Normotensive group (1.43%) were recorded. This again suggests a higher incidence of lower APGAR scores in the hypertensive group.

The majority of neonates in both groups had an APGAR score of 7. Specifically, 53 out of the 70 neonates in the Hypertensive group (76.50%) and 65 out of the 70 neonates in the Normotensive group (92.85%)

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fell into this category. This shows that while an APGAR score of 7 is common in both groups, it is more prevalent in the normotensive group.

Table 13:Comparison of APGAR score at 5 minutes in two groups

APGAR Score	Current Study (Hypertensive Group)	Current Study (Normotensive Group)	Apoorv & Amar (2023) (Hypertensive Group)	Apoorv & Amar (2023) (Normotensive Group)	Ramya et al. (2020) (Hypertensive Group)	Ramya et al. (2020) (Normotensive Group)
6	1.43%	0.00%	2.00%	0.50%	1.50%	0.50%
7	10.00%	1.43%	8.00%	1.50%	9.00%	1.00%
8	0.00%	2.86%	3.00%	2.00%	2.50%	2.00%
9	88.57%	95.71%	87.00%	96.00%	87.00%	96.50%

Chi-square value = 7.694 P value- 0.05278

The APGAR scores of the neonates reveal some differences between the two groups. In the Hypertensive group, 1 out of the 70 neonates had an APGAR score of 6, accounting for 1.43% of the group. In comparison, no neonates in the Normotensive group had an APGAR score of 6.

For the APGAR score of 7, 7 out of the 70 neonates in the Hypertensive group (10.00%) and 1 out of the 70 neonates in the Normotensive group (1.43%) fell into this category. This indicates a higher occurrence of slightly lower APGAR scores in the hypertensive group.

An APGAR score of 8 was not observed in the Hypertensive group, while 2 out of the 70 neonates in the Normotensive group (2.86%) had an APGAR score of 8.

The majority of neonates in both groups had an APGAR score of 9. Specifically, 62 out of the 70 neonates in the Hypertensive group (88.57%) and 67 out of the 70 neonates in the Normotensive group (95.71%)

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fell into this category. This shows that while a high APGAR score is common in both groups, it is slightly more prevalent in the normotensive group.

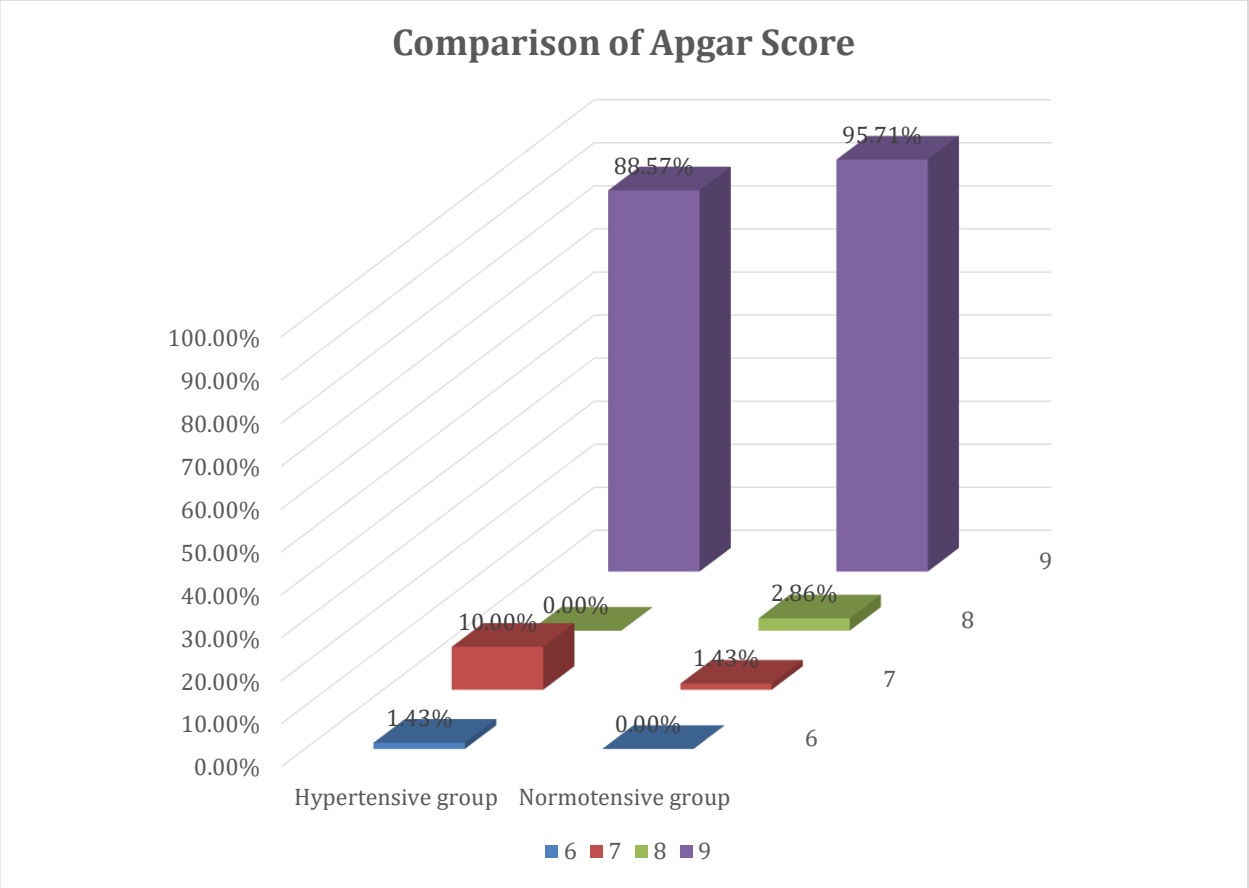

Figure 6: Comparison of Apgar score at 1 minute in two groups

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CONCLUSION

Pregnancy-related hypertensive diseases are intricate multisystem illnesses marked by extensive endothelial dysfunction affecting every essential organ system. Both the mother and the foetus have significant mortality and morbidity linked to these illnesses.

According to the current study's findings, mothers who have pregnancy-induced hypertension had significantly worse new born outcomes than mothers in the general population. Therefore, it is critical to identify PIH symptoms in mothers at an early age in order to prevent consequences including low birth weight, intrauterine growth restriction, and intrauterine fatalities. In order to effectively manage the neonate and prevent future morbidities and mortality, it is imperative to establish a thorough strategy for the evaluation and treatment of new born delivered to mothers with PIH. Our findings imply that close monitoring of hypertensive pregnancies and thorough prenatal treatment might enhance new born outcomes. Improved maternal and new born health can be achieved by the implementation of focused interventions and the provision of information to expectant women on the risks and management of PIH.

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