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STUDY OF PREGNANCY INDUCED HYPERTENSION AND PERINATAL OUTCOME

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ABSTRACT Hypertension in pregnancy is second leading cause of morbidity , mortality in United States, constitutes almost 15% of pregnancy related deaths and is major risk factor for foetal mortality ,morbidity .This study carried out to analysize correlation between all factors associated with hypertension and perinatal outcome which will be an important step in preventing perinatal mortality , morbidity. **Material And Methods:** Retrospective study carried out at tertiary center Vidarbha ,Maharashtra during January 2021 to December 2021.160 Patients included were those admitted in ANC ward ,with blood pressure of 140/90 mm of Hg or more on 2 occasions 6 hours apart with proteinurea,patients with antepartum and intrapartum eclampsia. **Results:** Out of 160 patients,96(60%) were mild preclampsia and 64(40%) were severe preeclampsia.The overall perinatal mortality was 18.75% out of it perinatal mortality is 8.3% among mild preeclampsia and in severe is 34.3%.

KEYWORDS : preeclampsia, perinatal mortality, morbidity

INTRODUCTION:

Incidence of perinatal loss and maternal mortality of a country can well be taken as a measure of its performance in the field of obstetrical and neonatal care.

There are many maternal and foetal factors which lead to perinatal deaths among these, maternal hypertension is an important one. While the adverse effects of maternal hypertension are well known, it is surprising to find that some severely hypertensive women produce normal healthy babies at term and some mildly hypertensive women have intrauterine deaths.

This obvious difference in the perinatal outcome must be due to some variable factors associated with hypertension, eg maternal age, parity, extent of antenatal care, nature and timing of delivery etc. similarly the degree of proteinurea, biochemical profile of the mother also can effect, the perinatal outcome of pregnancy. The type of management will of course maximally affect outcome of pregnancy.

Hypertension in pregnancy is the second leading cause of morbidity and mortality in the United States, constitutes almost 15% of pregnancy related deaths[1] and is the major risk factor for foetal mortality and morbidity [2-3].

An analysis of the correlation between all these factors and the perinatal outcome would be an important step in preventing the perinatal mortality and morbidity.

Present study will be carried out to study the perinatal mortality in these patients with analysis of the factors affecting the perinatal outcome in these pregnancies.

MATERIALS AND METHODS:-

Retrospective study carried out at tertiary center at Vidarbha, Maharashtra during January 2021 to December 2021.The instituitional ethical committee was informed. With Aims and objective

1. To calculate the perinatal mortality in pregnancies associated with pregnancy induced hypertension and to correlate it with the severity of the disease.
2. To evaluate the perinatal outcome in terms of prognostic parameters such as:
   a) Age of mother.
   b) Parity of mother.
   c) Antenatal care.
   d) Severity of hypertension.
   e) Degree of proteinurea.
   f) Serum uric acid levels in mother.
   g) Retinal changes in mother.
   h) Antihypertensive treatment.
   I) Complications:
      1. Abruptio placentae
      2. DIC
      3. HELLP syndrome.
      4. Eclampsia
      5. Renal failure
   k) Doppler studies in PIH.

3. To find out the extent of neonatal morbidity in pregnancy induced hypertension in terms of:
   a) Prematurity.
   b) Low birth weight
   c) Neonatal asphyxia.

Inclusion:-

Patients amitted in antenatal ward,women with bllod pressure of 140/90 mm of Hg or more on two occasions 6 hours apart with proteinurea, patients with antepartum and intrapartum eclampsia.

Exclusion:-

Emergency admission to labour room to avoid confusion in diagnosis as patients may have transient rise in blood pressure when in labour room.

There were total 160 patients with pregnancy induced hypertension.

Table 1: The Distribution Of These Patients According To Severity Of The Disease Was As Above

Group	No of cases	Percentage
Mild hypertension	96	60
Severe hypertension	64	40
Total	160	100

Table 2: Perinatal Mortality According To Severity Of The Disease

Group	No of cases	Still births	Neonatal deaths	PNM %
Mild	96	4	4	8.3%
Severe	64	15	7	34.3%
Total	160	19	11	18.75%

Table 3: Incidence Of Preterm Delivery And Its Effect On Perinatal Mortality In Hypertensive Disorders.

Gestational Age	Mild hypertension		Severe hypertension		Total	
	CASES	PND	CASES	PND	CASES	PND
< 32 weeks (early preterm)	6	1	2	1	8	2
32 – 36 weeks (late preterm)	8	1	24	2	32	3
> 37 weeks (term)	82	6	38	19	120	25
Total	96	8	64	22	160	30

Table 4: Birth Weight Distribution And Its Effect On PNM In Hypertensive Pregnancies.

Birth Weight In Grams	Mild hypertension		Severe hypertension		Total		
	CASES	PND	CASES	PND	CASES	PND	PNM%
1000 & less	1	1	3	3	4	4	100
1001 – 1500	8	3	9	8	17	11	64.7
1500-2000	45	4	40	8	85	12	14.11
2001-2500	24	0	10	2	34	2	5.8
2501 & more	18	0	2	1	20	1	5
Total	96	8	64	22	160	30	18.75

Table- 5 APGAR Score And Severity Of Disease

Group	APGAR SCORE AT 1 Min		
	0-3	4-6	Total asphyxiated babies
Mild hypertension	2	19	21
Severe hypertension	4	33	37
PND	6	5	11

Table 6: Effect Of Antenatal Care On Perinatal Mortality In Hypertensive Pregnancies.

NO. OF ANTENATAL VISITS	NO OF CASES	PND	PNM %
0	68	18	26.5
1	35	8	22.9
2	20	2	10
3 & ABOVE	37	2	5.4
TOTAL	160	30	18.75

Table 7: Degree Of Albuminurea And Its Effect On PNM In Hypertensive Pregnancies.

DEGREE OF ALBUMINUREA gm/L	NO. OF CASES	PND	PNM%
Nil	80	10	12.5
0.5 to 2	61	9	14.75
2 to 4	12	5	41.6
4 to 8	4	3	75
>8	3	3	100
TOTAL	160	30	18.75

Thus it is clear that there is a progressive increase in PNM with increasing protienurea.

Table 8: Effect Of Serum Uric Acid Levels On PNM In Hypertensive Pregnancies.

S. URIC ACID LEVEL	NO OF CASES	PND	PNM%
3. 9 and less	30	2	6.8
4 to 4.9	66	8	12.2
5 to 5.9	34	7	20.6
6 to 6.9	22	7	31.8
7 and more	8	6	75
TOTAL	160	30	18.75

Thus it is clear that increasing levels of serum uric acid are associated with increasing PNM.

Table 9: Incidence Of Different Grades Of Retinal Changes According To Severity Of Disease.

	Mild Hypertension		Severe Hypertension	
Retinal Changes	No	%	No	%
Nil	81	84.4	24	37.5
Grade I	14	14.6	26	40.6
Grade II	1	1	10	15.6
Grade III	-	-	3	4.7
Grade IV	-	-	1	1.6
TOTAL	96	15	64	62.5

In mild hypertension group 15 out of 96 (15%) patients had retinal changes.

In severe hypertension group 40 out of 64(62.5%) patients had retinal changes.

Table 10: Correlation Between Retinal Changes And PNM.

RETINAL CHANGES	NO OF CASES	PND	PNM%
Nil	105	9	8.6
Grade I	40	12	30
Grade II	11	6	54.5
Grade III	3	2	66.6
Grade IV	1	1	100
TOTAL	160	30	18.75

Lowest PNM was observed in the absence of retinal changes.

There was progressive increase in PNM with increasing grades of retinal changes. There was marked increase in PNM with grade II or more retinal changes.

Table 11: Effect Of Maternal Age On Perinatal Mortality In Hypertensive Pregnant Patients.

AGE IN YEARS	NO OF CASES	PND	PNM%
15 to 19	26	7	26.9
20 to 24	84	9	10.7
25 to 29	38	9	23.7
30 & above	12	5	41.7
TOTAL	160	30	18.75

Above figures show that PNM in hypertensive pregnancies is high at the extremes of age group while it is lowest in the 20-24 age group.

Table 12: Eclampsia In Hypertensive Disorders Of Pregnancy And PNM:

Group	ECLAMPSIA No of cases (%)		SB	NND	PNM%
Mild hypertension	-	-	-	-	0%
Severe hypertension	3	(4.6%)	1	-	33%
Total	3	(1.875%)	1	-	33%

Overal incidence of eclampsia 1.87%.

There was increase in incidence of eclampsia with increasing severity of the disease.

Overal PNM in eclampsia group was 33%.

Table 13: Incidence Of Abruption Placentae And Its Effect On PNM.

	ABRUPTION		SB	NND	PNM%
GROUP	No of Cases	%			
Mild hypertension	4	4.2	1	1	50
Severe hypertension	9	14	6	1	77.8

Table 14: Perinatal Mortality Related To HELP In Pregnancy Induced Hypertension.

HELLP SYNDROME	NO OF CASES	PND	PNM%
CLASS I	1	1	100
CLASS II	3	2	66.7
CLASS III	68	14	20.6
Pt not in HELLP Syn.	88	13	14.8
TOTAL	160	30	18.75

PND is 3 times in Class II and 5 times in Class I as compared to Class III.

Table 15:- DIC With Hypertension And Perinatal Mortality.

GROUP	NO OF CASES IN DIC	PND	PNM %
MILD	4	2	50%
SEVERE	9	5	55%
TOTAL	13	7	53.8 %

Table 16: Renal Failure In Hypertensive Disorders Of Pregnancy And PNM:

Renal failure	No of cases	PND	PNM%
Present	6	2	33.3%
Absent	154	28	18.8%
Total	160	30	18.75%

Table 17:

Group	No of cases	PND	PNM%
Therapeutic MgSO4 given	3	1	33%
Prophylactic Mgso4 given	49	9	18.36%
MgSO4 not given	108	20	18.5%
Total	160	30	18.75%

Therapeutic or prophylactic magnesium sulphate given to the mother and its effect on PNM in severe PIH:
Antihypertensive treatment given to the mother and its effect on PNM

in severe PIH.

Table 18:

GROUP	NO OF CASES	PND	PNM%
Anti-HT treatment given	120	23	19.16
Anti-HT treatment not given	40	7	17.5

In this study anti-hypertensive treatment did not have any effect on PNM.

Table 19: Doppler Studies Of Umbilical Artery And PNM

S/D ratio	NO OF CASES	PND	PNM%
.>/=	130	9	6.9%
AREDV	30	21	70%
TOTAL	160	30	18.75%

The PNM was 70% in umbilical artery absent/ reverse end diastolic flow velocity.

DISCUSSION:-

A total of 160 patients with pregnancy induced hypertension admitted to the antenatal ward in tertiary center,Vidarbha,Maharashtra State were carefully selected(January2021- December 2021)

1. Out of 160 patients,96(60%) were having mild and 64(40%)were having severe hypertension(Table 1).
2. The overall perinatal mortality was 18.75% in our study. It was 8.3% in mild hypertensive group and 34.3% in severe hypertensive groups.so our figures are comparable to those of Das et al.(4)[table 2]
3. Incidence of perinatal deaths in the preterm was 12.5% whereas in the term of babies it was 20%. Thus there is reduction in mortality associated with PIH in early and late preterm infants.
4. There was 14.5% preterm births in mild as compared to 40.6% in severe hypertensive groups. Thus prematurity increases with increasing severity of the disease,this correlate with the previous study reported.[table 3](5).
5. The incidence of low birth weight babies was 96.8% in severe hypertensive group which was more than that in mild hypertensive groups i.e. 81.25%. The perinatal mortality was 33.8% in the low birth weight babies in the severe hypertensive groups as compared to 10.25% in the mild hypertensive group. Thus the perinatal mortality decreases as the birth weight increases and severity decreases.[table 4],these findings were similar to previous reported studies(6,7)
6. 22.8% babies were asphyxiated in mild hypertensive group as compared to 75.4% in severe hypertensive group. Thus the neonatal asphyxia was significantly more in severe hypertensive group.
7. There was 18.9% neonatal deaths associated with neonatal asphyxia.[table 5],previous studies reported 26.2%neonatal deaths in hypertensive group(8)
8. The perinatal mortality was 26.5% and 22.9% in those with no or only one antenatal visit as compared to only 5.4% perinatal mortality in those patients having 3 or more antenatal visits.[table 6] similar to those of Houth et al.(9)
9. There is progressive increase in PNM with increase increasing protienurea and above 2 gm/L the PNM is more than 40%[table 7].It goes with the study of Shotri et al.(10)
10. When serum uric acid levels are less than 6 mg% the perinatal mortality was 13% but it increased precipitously till 43.3% when serum uric acid levels crossed 6 mg%.[table 8] observation similar to Redman et al(11)
11. In mild hypertensive group 15% patients had retinal changes and in severe 62.5% had retinal changes. Thus retinal changes are more in severe hypertensive cases.[table 9].
12. In absence of retinal changes there was 8.6% PNM but it increases with increasing grades of retinal changes.There was marked increase in PNM in grade II or above retinal changes i.e 54.5%, 66.65 and 100% in grade II, grade III , and grade IV respectively.[table 10] similar goes with Naval Kishore and Tandon et al (12)
13. The PNM was 26.9% and 41.7% in women of (15-19) yrs and(30 yrs& above) respectively. Whereas PNM was 10.7% and 23% in age group of (20-24) yrs and (25-29) yrs respectively. Thus the PNM is high at the extremes of age group while it is lowest in (20-24) years age group.[table 11] Baird et al have similar observation.(13)
14. Overal incidence of eclampsia in this study was 1.87%. Eclampsia increases the rate of PNM upto 33% and also incidence of eclampsia and its perinatal mortality increases with the severity of the disease.[table 12].According to Swain S et al ,the perinatal mortality was 38.6% amongst cases of eclampsia.(14)
15. Abruptio placentae was 4.2% and 14% in mild and severe hypertensive group respectively.Thus the incidence of abruption increases with increasing severity of the disease. Overal PNM in abruption placentae with hypertension was 69.2%[table 13].Hendric and Brenner et al have observed the incidence of abruption placentae as 8% of all the toxemic patients.(15)
16. In HELLP the perinatal mortality is 100% for Class I, 66.7% for Class II , and 20.6% for Class III.PNM was tripled for Class II and was five times for Class I as compared to Class III.[table 14],in Mississippi series stillbirths was almost tripled for Class I or Class II compared with Class III.(16)
17. DIC with hypertension increases the perinatal mortality to 53.8%.[table 15],goes with the study of Yang M et al(17).
18. In renal failure with hypertension the perinatal mortality was 33.3%.[table 16]According to Nzerue et al there were 38% stillbirths in those with renal failure,eclampsia and preeclampsia(18).
19. PNM was 19.16% and 18.36% in cases in whom anti-hypertensive treatment and prophylactic magnesium sulphate was given respectively; as compared to 17.5% and 18.5% in case where anti-hypertensives and prophylactic magnesium sulphate was not given . Thus antihypertensives and prophylactic magnesium sulphate half the risk of complications but did not affect the PNM significantly.[table 17,18],similar to Magee et al(19) and Magpie trial collaborative group(20).
20. The perinatal mortality was 70% in umbilical artery absent / reverse end diastolic flow velocity.[table 19],according to Joern et al that in cases of Doppler distortion of double side uterine artery 90% problems develop.(21).

CONCLUSION:

Perinatal outcome in terms of prematurity,low birth weight,neonatal asphyxia, associated maternal complicating factors was studied and statistically analysed.

Lack of antenatal care ,poor neonatal care facilities are the main causes of perinatal mortality in patients of hypertensive pregnancies.

The incidence of prematurity,low birth weight , neonatal asphyxia is higher in pregnancies complicated by hypertension and increases progressively with the severity of the disease.

According to analysis of the data compiled,a hypertensive woman with the following observations are high risk patient in terms of perinatal outcome:

1. Unregistered
2. Severe hypertension.
3. Maternal age of less than 19 years or more than 25 years.
4. Presence of proteinurea more than 2 gm%.
5. Serum uric acid levels 6 gm% and more.
6. Retinal changes of grade II or more.
7. Umblical artery Doppler studies reveals absent /reverse end diastolic flow velocity.
8. Complications: Eclampsia,DIC,HELLP,Abruption,Renal failure.

Anti hypertensive and prophylactic magnesium sulphate half the risk of progression to severe hypertension but no benefit in gestation at eventual delivery or reduced obstetric intervention.

Management focuses on controlling blood pressure ,monitoring mother, fetus to optimise the timing ,mode of delivery ; however antihypertensive therapy is not aimed primarily at the disease process , but rather at its manifestations. There is no established prophylactic therapy.Primary preventive therapy is hampered by our lack of reliable means of identifying high risk cases. Research is required for pre-eclampsia and its perinatal outcome to improve the perinatal mortality rate.

Abbreviation:- PND-perinatal deaths,PNM-perinatal mortality

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