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Community Medicine

MATERNAL AND FOETAL OUTCOMES IN PREGNANCY INDUCED HYPERTENSION AMONG ANTENATAL MOTHERS ATTENDING GAUHATI MEDICAL COLLEGE AND HOSPITAL, ASSAM.

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ABSTRACT **Background :** Pregnancy-induced hypertension (PIH) is a syndrome of hypertension usually occurring late in pregnancy and regressing after delivery. PIH is one of the major causes of maternal & perinatal morbidity and mortality[1]. A report "Global Statistics –PREGNANCY INDUCED HYPERTENSION" estimated that Global prevalence of pregnancy induced hypertension among women is 10-13.However,17.3% of maternal death occur in Assam is due to PIH. Objectives: 1. To find out the maternal and fetal outcomes pregnancy induced hypertension among antenatal mothers 2.To study the factors leading to PIH in pregnancy among the study population. Materials and methods: A prospective cohort study was conducted in the department of Obstretics and Gynecology at Gauhati Medical College and Hospital for a study period of one year. 400 antenatal mothers were taken out of which 120 with PIH and 280 without PIH .Data about maternal risk factors ,maternal complications ,maternal and neonatal outcomes , were collected in predesigned and pretested schedule. Data analysis was done using Microsoft Excel software. Ethical approval was obtained from the Institutional Ethics Committee. **Results:** Primiparity ,increasing BMI ,family history preeclampsia were found to be important risk factor in development of PIH.All the maternal complication like PPH and maternal deaths were found to be high in PIH ,the rate of neonatal outcomes like preterm baby ,IUFD ,LBW ,NICU admission was also noted to be high in PIH. **Conclusion:** Pregnancy induced hypertension is a common medical disorder seen associated with pregnancy especially among young primigravidas .Association of various risk factors with Pregnancy induced Hypertension and its feto maternal outcomes observed were young age , lack of proper antenatal care , illiteracy and low socio economic status . Maternal and fetal morbidity can be reduced by early recognition and institutional managemen.

KEYWORDS : Pregnancy induced hypertension , maternal outcome, foetal outcome.

INTRODUCTION

Hypertensive disorders in pregnancy is one of the commonest medical disorders in pregnancy is one of the major causes of maternal & perinatal morbidity and mortality [1]. Pregnancy-induced hypertension (PIH) is estimated to affect 7% to 10% of all pregnancies in the United States [2-5]. Approximately, in a year, 56,000 women in India die due to complications of pregnancy and child birth. .MMR for Assam stood at 205. Highest prevalence was in Upper Assam division at 404 comprising districts of Tinsukia, Dibrugarh, Sibsagar, Jorhat and Golaghat.However,17.3% of maternal death occur in assam is due to PIH. In India – Gestational Hypertension continues to be responsible for the largest proportion of perinatal deaths resulting from prematurity and IUGR and is a major contributor to perinatal and maternal morbidity and mortality [1] . Making motherhood safe is essential to reduce the maternal mortality and morbidity. This can be done by various activities like providing quality care to the women during antenatal, intranatal and postnatal period, creating awareness regarding care during these period.

OBJECTIVE

1-To find out maternal and foetal outcomes in Pregnancy Induced Hypertension among antenatal mothers attending Gauhati Medical College and Hospital, Assam.
2-To study the factors leading to PIH in pregnancy among the study population.

MATERIALS AND METHODS

A Hospital-based Prospective Cohort study was conducted in. Gauhati Medical College and Hospital (GMCH), a tertiary care hospital .All Pregnant women aged 18-35 years, till 28 weeks of gestation attending Ante-natal clinic at GMCH, Department of Obstetrics and Gynecology during the period August 2021 to November 2021.

Out of 400 participants those who developed PIH were designated as exposed groups those who normotensive were designated as unexposed groups. Participants not willing to participate and Severely ill patient were excluded.

Prevalence of PIH in Pregnancy was estimated to be 8%. Assuming the same prevalence of PIH in Pregnancy for our study, the number of pregnant women was estimated according to the formulae. $n = Z2\ pq/d2$

The sample size from the above formula comes out to be 327. Taking attrition of 20%, the actual sample size calculated is 391 which is rounded to 400. Thus we selected 400 participants who were followed up till termination of pregnancy.

The patients were selected from the Antenatal OPD of the GMCH.. In the OPD, every 3rd patient was informed about the study and taken as a participant after the informed consent. The selection procedure was continued till the required sample size of 400 was selected. The study subjects were followed for the period of pregnancy till delivery and subsequently two group were formed, one Exposed another Non-exposed. Out of 400 participants 120 participants developed PIH were designated as Exposed group and the rest 280 normotensive women were designated as Nonexposed group Pre-designed and pre-tested structured Pro-forma, Sphygmomanometer, Stethoscope Measuring tape ,Weighing machine ,Glucometer used as data collection tool.

For the participants registering in the first trimester ,3 antenatal visits were done, for those registering in the second trimester, 2 antenatal visits were done, for those registered the third trimester 1 antenatal visit was done. Those patients who did not came for next antenatal visit they contacted over phone. Those participants who delivered at home and private hospital they contacted via phone and details of mother and neonate were taken. Information about neonates was also collected from birth notes and hospital discharge certificates. Neonates were examined till seven days of the birth.

STUDY VARIABLES

Age, Antenatal visits for present pregnancy and Parity ,BMI ,Family history of hypertension,Hypothyroidism, GDM, Anemia, Post-partum haemorrhage (PPH) Fetal outcomes like Intra Uterine Foetal Death (IUD), Preterm Birth, Low Birth Weight, NICU admission.

DATA ANALYSIS Data was collected as spreadsheet and analyzed in MS excel and SPSS software.

ETHICAL CLEARANCE

As obtained from the Institutional Ethics Committee, Gauhati Medical College and Hospital Informed consent was taken from each study subject before proceeding to the interview.

Table 1: DISTRIBUTION OF PARTICIPANTS ACCORDING TO AGE .

Age (In Years)	WITH PIH		WITHOUT PIH		TOTAL	
	N	%	N	%	N	%
≤25	29	(24.1)	52	(18.6)	81	(20.3)
26-30	57	(47.5)	182	(65)	239	(59.7)
>30	34	(28.4)	46	(16.4)	80	(20)
Total	120	(100)	280	(100)	400	(100)

Table 2 :DISTRIBUTION OF PARTICIPANTS ACCORDING TO THEIR ANTENATAL HISTORY

ANTENATAL CHECKUP	WITH PIH		WITHOUT PIH		TOTAL		STATISTICAL VALUE
1-2 times	15	(12.5)	25	(8.9)	40	(10)	
2-3 times	25	(20.9)	35	(12.5)	60	(15)	
3-4times	45	(37.5)	150	(53.6)	195	(48.7)	
>4times	35	(29.1)	70	(25)	105	(26.3)	
PARITY							P
PRIMIPARA	105	(87.5)	240	(96.4)	345	(86.2)	value=<0.75
MULTIPARA	15	(12.5)	40	(3.6)	55	(13.8)	
TOTAL	120	(100.0)	280	(100.0)	400	(100)	
BMI							Pvalue=<0.0001
UNDERWEIGHT(<18.5)	7	(5.8)	29	(10.3)	36	9	
NORMAL(18.5-24.9)	47	(39.2)	148	(52.1)	195	(48.7)	
PREOBESE(25-29.9)	48	(40)	48	(17.2)	96	(24)	
0BESE(>30)	18	(15)	55	(19.7)	73	(18.3)	

Table 3 :DISTRIBUTION OF PARTICIPANTS ACCORDING TO RISK FACTOR OF PIH

	WITH PIH		WITHOUT PIH		TOTAL		Statistical value
Hypothyriodism	N	%	N	%	N	%	Pvalue=<0.0364
PRESENT	25	(20.95)	34	(12.1)	59	(14.8)	
ABSENT	95	(79.1)	246	(87.9)	341	(85.2)	
Gestational Diabetes Mellitus							
PRESENT	75	(62.5)	90	(32.1)	165	(41.2)	Pvalue=<0.0001
ABSENT	45	(37.5)	190	(67.1)	235	(58.5)	
Family history of Preeclampsia							
PRESENT	50	(41.7)	43	(15.3)	93	(23.2)	Pvalue=<0.0001
ABSENT	70	(58.3)	237	(84.7)	307	(76.8)	
Anemia							
PRESENT	30	(25)	55	(19.7)	85	(21.2)	P value =<0.28
ABSENT	90	(75)	225	(80.3)	315	(78.8)	

Table 4: DISTRIBUTION OF PARTICIPANTS ACCORDING TO MATERNAL OUTCOMES .

PPH	WITH PIH		WITHOUT PIH		TOTAL		STATISTICAL VALUE
	N	%	N	%	N	%	P.value =<0.0006
PRESENT	11	(10)	4	(1.6)	15	(4.1)	
ABSENT	99	(90)	251	(98.4)	350	(95.9)	

Maternal Death							P value=<0.013
PRESENT	8	(7.3)	4	(1.6)	12	(3.3)	
ABSENT	102	(92.7)	251	(98.4)	353	(96.7)	

TABLE 5: DISTRIBUTION OF PARTICIPANTS ACCORDING TO NEWBORNS OUTCOMES

BIRTH TYPE	WITH PIH		WITHOUT PIH		TOTAL		STATISTICAL VALUE
IUFD	10	(8.3)	25	(8.9)	35	(8.7)	Pvalue=<0.864
LIVE	100	(91.7)	225	(91.1)	365	(91.3)	
PRETERM BABY							
PRESENT	10	(10)	7	(2.7)	17	(4.6)	P value =<0.017
ABSENT	100	(90)	248	(97.3)	348	(95.4)	
NICU ADMISSION							
PRESENT	12	(10.9)	20	(7.9)	32	(8.8)	P value=,0.45
ABSENT	98	(89.1)	235	(92.1)	333	(91.2)	
LBW							
PRESENT	76	(69.1)	62	(24.3)	138	(37.8)	Pvalue=0.0001
ABSENT	34	(30.9)	193	(75.7)	227	(62.2)	

N*= 365 No of pregnancy having live birth

RESULTS

It was observed from Table 1 that majority of the pregnancy with PIH 57(47.5%) were in the age group 26-30 years and age group less than 25 years comprised of least number of pregnancy with PIH 29(24.1%) It was evident from Table 2 Out of 120 PIH cases 45(37.5%) done 3-4 times antenatal checkup whereas 15(12.5%) done 1-2 times antenatal checkup, out of 280 without PIH cases 150(53.6%) done 3-4 times antenatal checkup and 25(8.9%) done 1-2 Majority of the women with PIH 105 (87.5%) were primipara and 15(12.5) were multipara whereas in without PIH case 240(96.4%) were primipara and 40(3.6%) were multipara shows insignificant association with PIH. Out of 120 PIH cases47(39.2%) were normal ,48(40%) were preobese and 18(15%) were obese whereas in without PIH 148(52.1%) were normal ,48(17.2%) were preobese and 55(19.7%) were obese shows p value <0.0001 statistically significant association.

It was evident from Table 3 women with PIH 25 (20.9%) had hypothyroidism , 95(79.1%) were not suffering from hypothyroidism which shows significant association with PIH. Among the PIH cases 75 (62.5%) had GDM ; 45 (37.5%) had no history of GDM, which shows p value 0.0001 association with PIH. Out of 120 pregnant women with PIH, only 50(41.7%) participants gave positive history of preeclampsia. Out of 280 participants without PIH only 43 (15.3%) gave family history of preeclampsia showing p-value <0.0001 show positive association.Out of 120 women with PIH 30(25%) were suffering from anemia whereas 90 (75%) were not suffering from anemia which shows no association with PIH.

It was observed from Table 4 that a highly significant risk of PPH has been found with PIH cases.and p value =0.006 show positive association and 7.3% of maternal death occur in PIH shows significant association with PIH.

From Table 5 we can conclude that Among cases with PIH 10 (8.3%) incidence of IUFD was occur and 110 (91.7%) of live birth was occur whereas 25 (8.9%) incidence of IUFD and 255(91.1%) of live was occur in without PIH cases. Out of 110 PIH participants 10 (10%) had preterm baby ; among 280 participants without PIH 7(2.7%) had preterm baby, with p value=0.017 showing significant association with PIH. Out of 110 PIH case 10 (9.9%) were having nicu admission whereas in 100(90.1%) cases, NICU admission was absent which shows no association with PIH. Incidence of LBW is high with PIH with p value 0 .0001 which shows significant association with PIH.

DISCUSSION

Feto-maternal morbidity and mortality associated with hypertensive disorders is an alarming concern, especially in developing countries. One of the primary reasons being inadequate antenatal surveillance and management of these cases in less favourable context.

Table 1. In present study majority of the pregnancy with PIH 57(47.5%) were in the age group 26-30 years and age group <25 years comprised of least number of pregnancy with PIH 29(24.1%.) Similar

findings were observed in cohort study done by Nadkarni et al (2001) and reported majority of the hypertensive mothers in their study between the age group of 21-25 years.[6]

Table 2- Out of 120 pih cases 45 (37.5%) done 3-4 times antenatal checkup whereas 15(12.5%) done 1-2 times antenatal checkup. shows significant association. The health-seeking behavior of the participants is evident from the number of antenatal check-ups done. In the present study 79.1% of women with PIH done adequate antenatal check-up: 77.1% women without PIH have done adequate antenatal check-up. In this study among the 400 participants 86.2% were primigravida and 13.8% were multigravida. Out of 120 pregnancies with PIH majority 87.5% were primipara.[8]

Similar observation was found in cross sectional study was done in Marcelona, Bitola by Jasovic-Siveska E,et al(2011) and found that average age is 25.73+/-5.77 years. The largest number of primipara with preeclampsia is in category from 20 years ($p<0.01$).

Out of 120 PIH cases 47(39.2%) were normal ,48(40%) were pre-obese and 18(15%) were obese shows p value <.0001 statistically significant association .Similar findings were observed in case control study in district hospital in South India by Kumar S Ganesh et al and found that BMI ≥25) (OR = 11.27).[9]

Table 3- In this study among all participants 62.5% women with PIH shows association with GDM which is highly significant. Shuyan Qu1 et al (2021) conducted a retrospective cohort study in China and revealed that pregnancy GDM (OR 4.50, CI 2.08-9.74), ($P<0.05$). This study found that GDM was significantly associated with preeclampsia, womenwith GDM are 2.95 times more likely to show preeclampsia than women without GDM.[10]

In this study the women with PIH 25% (30) were suffering from anemia shows insignificant association with anemia . Contrary to this findings, a retrospective case control study conducted at Sudan, by Abdel Aziem A Ali et al, and found that risk for preeclampsia increased only in severe anaemia (OR = 3.6, 95% CI: 1.4-9.1, P = 0.007). 152 In this study women with PIH 20.9% had hypothyroidism association showing significant association with PIH. Krassas G et al (2018) found that TSH is a very sensitive marker of thyroid dysfunction during pregnancy. On other hand, poor control of thyrotoxicosis is associated with a risk of spontaneous abortion, congestive heart failure, thyrotoxic storm, preeclampsia, preterm delivery, low birth weight and stillbirth.[12]

In this study pregnant women with PIH, only (41.7%) participants gave positive family history of preeclampsia. Out of 280 participants without PIH only 15.3% (43) gives family history of preeclampsia showing p-value <0.0001 show positive association. Heather A. Boyd et al (2013) conducted a study and found that maternal family history of early-, intermediate-, or late-onset preeclampsia was associated with 2.15 times, 2.08 times, and 1.49 times the risk, respectively, of the corresponding form of preeclampsia compared with pregnancies in women with no family history of that type of preeclampsia.[13]

Table 4- In this study among the 400 participants, 265 (66.3%) had vaginal delivery, 110 had underwent C- section. Out of 120 pregnancies with PIH, majority 58.3% (80) had vaginal delivery. Therefore there is no association between mode of delivery and PIH. In the present study, majority of the participants 75% in normal pregnancy and 66.7% in PIH show normal vaginal delivery. Contrary to this context study done by Aabidha et al observed 58% of the patients were induced and 45% needed caesarean section due to obstetric indication in severe preeclampsia patients.[14]

In this study significant risk (RR=2.5) of PPH has been found with PIH cases and p value =0.006 show positive association Eskild et al showed an increased risk for PPH in women with PE (≥500 ml blood loss, OR 1.94 95% CI 1.87 to 2.02.[15]

Similar observation was found in retrospective observational study at Chhattisgarh Institute of Medical Sciences,Bilashpur conducted by Murthy M K et al and found that the maternal mortality rate due to eclampsia was observed to be 8.4%.[16]

Table 5- Out of 110 PIH case 10% had delivered preterm baby with p value=0.017 show significant association with preterm baby.

Similar study was done by Desouza Rugolo LMS et al (2011) found that PE and early gestational age at delivery, with subsequent neonatal pre maturity complications, although it does not seem to be an independent marker of adverse perinatal outcome.[17]

In this study out of all 400 pregnancy, 35 resulted in intrauterine death, majority of them died between 28-36 weeks of gestation. With agreement to this findings study was conducted by Svetlana Shikanova et al(2019) and found that 21-year-old pregnant woman with severe PE and intrauterine fetal death, delivered by cesarean section (CS)[18]

Out of 110 PIH case 10 (9.9%) having nicu admission with p value-0.84 showing insignificant association with PIH. Similarly, prospective observational study was done in Niloufer hospital at Hyderabad conducted by Siromani SM et al,[18} and found that in PIH group 34.25% neonates needed NICU admission and in normotensive group 16.16% neonates needed NICU admission .

LIMITATION OF STUDY

For outcome variables factors other than PIH which may confound the results could not be assessed Due to the Covid pandemic, a fewer number of participants attended the hospital, for which the sample size for the study had to be adjusted. Follow-up of the participants could not be done more frequently due to the Covid pandemic.

CONCLUSION

Pregnancy Induced Hypertension to be an important etiological factor for maternal fetal morbidity and mortality. Association of various risk factors with Pregnancy induced hypertension and the fetomaternal outcomes have been demonstrated in our study. Hence regular antenatal checkup is very important.

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Conflicts of interest
There is no conflict of interest.

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