

RESEARCH ARTICLE

MATERNAL AND PERINATAL OUTCOME IN PREGNANCIES COMPLICATED WITH HYPERTENSIVE DISORDER OF PREGNANCY.

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Key words:-

hypertensive disorders of pregnancy, maternal outcome, perinatal outcome.

Abstract

Background:Hypertensive disorders in pregnancy remain a major global health issue because of the associated perinatal morbidity and mortality. The outcomes of women with hypertensive disorders in pregnancy in our hospital in rural area of India have not yet been documented.

Objective: To determine maternal and perinatal outcome in pregnancies complicated with hypertensive disorder of pregnancy at a tertiary care hospital in rural area of India.

Material and methods: A prospective study was undertaken on 200 consecutive women of hypertensive disorder in pregnancies that were managed in the Department of Obstetrics &Gynaecology in our hospital from October 2017 to September 2018. The demographic data, clinical and laboratory findings delivery route, indications of caesarean section, foetal and maternal complications were determined.

Results:Out of 200 women, 62.2% were found to have pre-eclampsia, 8% had eclampsia, and 27 % had gestational hypertension and 2.5% had chronic hypertension. Proteinuria was demonstrated in 67.5%, thrombocytopenia in 15.5%, liver dysfunction in 11%, abruptio placenta in 4.5%, HELLP syndrome in 3%, and retinal detachment in 0.5% of women. 46.5% women had caesarean section delivery. There was no maternal mortality. 45% neonates were small for gestational age (SGA), 22.5% needed NICU admission. There were 4.5% still births and 3.5% neonatal deaths.

Conclusions:Hypertensive disorder of pregnancy is associated with increased risk of maternal and perinatal adverse outcome. The complications could be reduced by regular antenatal check-up, early identification of hypertension and timely referral and specialist care during labour and after birth.

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Introduction:-

Hypertensive disorders in pregnancy (HDP) remain a major global health issue not only because of the associated high adverse maternal outcomes; but there is a close accompaniment of significant perinatal morbidity and mortality. They are one of the major contributors to maternal and fetal morbidity and mortality globally, with approximately 30,000 maternal and 500,000 perinatal deaths annually. Maternal complications include eclampsia, stroke, and damage to the hepatic and renal organs (1). The risk of maternal death is less than 1% in severe pre-

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eclampsia and that of perinatal death is about 13%. The situation is worse for eclampsia where the risk of maternal and perinatal deaths occur in about 5% and 28% respectively (2). Most of the major complications of hypertensive disorders of pregnancy leading to severe maternal outcomes, including deaths and severe morbidities, are preventable and treatable. Perinatal mortality is a key indicator of maternal care and a reflection of the quality of obstetric and paediatric care available. The outcomes of women with hypertensive disorders in pregnancy in our hospital in rural area of India have not yet been documented, but clinical experience shows that hypertension is associated with significant maternal complications. Therefore the aim of the present study was to determine the maternal and perinatal outcome of hypertensive disorders in pregnancy (HDP) among pregnant women obtaining maternity and childbirth services at Dr R.P.G.M.C Kangra at Tanda, H.P. India.

Material and methods:-

A prospective study was undertaken on 200 consecutive women of hypertensive disorder in pregnancy (HDP) that were managed at Dr R.P.G.M.C Kangra at Tanda, H.P. India in the Department of Obstetrics &Gynaecology from October 2017 to September 2018 after the approval was obtained by the institutional ethics committee. Inclusion criteria:

All the women with hypertension in pregnancy (systolic blood pressure >140mmHg or diastolic blood pressure >90mmHg measured on at least two occasions at six hours apart, who were willing to participate and continue in the study and gave informed consent were included.

Exclusion criteria:

- 1. Women with multiple pregnancy,
- 2. Known cases of chronic renal disease, diabetes mellitus, heart disease or other medical disorders that affect the mother or the fetus, and
- 3. Congenital malformation of the fetus.

History, demographic data, age, parity, gestational weeks, clinical and laboratory findings were recorded. The investigations done on all the women included hemoglobin and hematocrit, blood grouping and Rh typing, platelet count, peripheral blood film, bleeding time and clotting time, clot observation test, 24 hour urine protein estimation, liver function tests, serum LDH, renal function tests, obstetric ultrasound for the amniotic fluid status and fetal birth weight estimation, and ophthalmoscopic examination for hypertensive changes in the fundus. For fetal surveillance women were advised to keep kick count. Non-stress test (NST) and biophysical profile (BPP) and fetal Doppler was done once a week or more frequently. The tests were repeated whenever indicated.

All the women with gestational age between 28 to 34 weeks were managed expectantly if their blood pressure was adequately controlled and there was reassuring fetal assessment during 24-hour observation period. They were given corticosteroids to accelerate lung maturation. These women were followed until emergent indication for delivery. Antihypertensive drugs were given if systolic blood pressure was persistently equal to or more than 160/110. Methyldopa 250 mg b.i.dupto a maximum of 4gm/day, labetolol 100 mg b.i.d with a maximum of 2400mg/day and nifedipine 10 mg b.i.dupto a maximum of 120 mg/day was used alone or in combination. Parenteral antihypertensive (Labetolol 20-40 mg I.V for a maximum dose of 220mg) was used for persistent severe hypertension. Pritchard regimen using magnesium sulphate was used in impending eclampsia and eclampsia.

Maternal complications such as severe hypertension, significant proteinuria, haematological abnormalities, renal impairment, liver disease, neurological disturbances (scotoma, severe headache with hyper-reflexia, hyper-reflexia with sustained clonus >3 beats) or any other morbidity were recorded. Indications for delivery before 37 weeks such as fetal compromise, premorbid cardiotocographic tracing of fetal heart, failure of fetal growth as assessed by ultrasonography, inability to control maternal blood pressure, persistent neurological disturbances, progressively rising liver enzymes, rising serum creatinine levels, or worsening thrombocytopenia were recorded.

Elective caesarean section was done as per the obstetrical indication. Delivery by induction of labour was scheduled after 37 weeks gestation if the blood pressure remained stable and the cervix was favourable. Labour was monitored partographically. Duration of pregnancy at the time of delivery, method and indication of induction, and mode of delivery were recorded. In case of caesarean section the indication of cesarean , type of anesthesia, intra-operative complcations, and postoperative morbidity were recorded.

Examination of newborn was done. Apgar scores at 1-minute and 5-minute of birth, resuscitation required, the sex of the baby, birth weight and congenital abnormality was noted. Fetal complications such as small for gestational age (birth weight below 10th percentile), prematurity (delivery before 37 completed weeks of gestation), NICU admission and morbidity or mortality in early neonatal period, if any was recorded in association with the paediatricians.

Calculation of perinatal mortality was based on a minimum weight of 1000gm or more with respect to the fetus or the infant or on 28 week completed gestation, or a length of 35 cm from crown to heel. The perinatal mortality rate was calculated as still births plus first week deaths per 1000 births.

Results:-

During the study period, there were a total of 7253 deliveries in our hospital. A total of 200 women with pregnancy induced hypertension who fulfilled the eligibility criteria and gave informed consent were studied. Mean age of the women was 25.43±3.5years. 186 women (93%) were in the age group of 20-30 years. Socio-demographic profiles of the women are presented in Table I. The presenting symptoms, gestational age at the time of admission, type of hypertensive disorder and hypertensive changes in the fundus are shown in Table II. Relevant laboratory test results are shown in Table III. Maternal complications and morbidities need for antihypertensive drugs and magnesium sulphate use is shown in Table IV.

Out of 200 women, 92(46%) had spontaneous onset of labour and 99(49.5%) had induced labour. 93(46.5%) women had cesarean section delivery. Onset of labour, mode of delivery, indications of cesarean section are shown in Table V. Neonatal birth weight and Apgar scores are shown in Table VI. Neonatal morbidity and mortality is shown in Table VII.

Discussion:-

Hypertensive disorders of pregnancy are considered to be a major worldwide problem running an increased risk of maternal and perinatal morbidity and mortality. The spectrum of disease ranges from mildly elevated blood pressure with minimal clinical significance to severe hypertension and multi organ dysfunction (1,2,3).

In an international cohort study, the incidence of hypertensive disorders of pregnancy ranged from 10.3% to 16.4% in different territory (3). In a community based study in India, Mehta (4) observed a prevalence of 6.9%. Women with pre-existing diabetes, multiple pregnancy and co-morbidities that could affect the maternal and neonatal outcome were excluded from our study. This explains the 2.7% rate of HDP in our study. Further, a number of patients with early onset and severe hypertension go to other healthcare facilities with dedicated neonatology unit. Our study demonstrated that 62.5% women had pre-eclampsia, 27% has gestational hypertension, 8% had eclampsia and 2.5% had chronic hypertension. One woman (0.5%) had postpartum eclampsia, thus emphasizing the need for good postpartum care and follow-up. Bonsaffoh (2) in their study on 368 women found that 50% women had gestational hypertension, 38% pre-eclampsia, 6.25% chronic hypertension, and 5.7% women had pre-eclampsia superimposed on chronic hypertension.

Yang et al stated that hypertensive disorders during pregnancy, postpartum hemorrhage, anemia, thrombocytopenia, hepatomegaly, and cardipmyopathy were the principal causes of maternal near miss (MNM). Most of these women died in low-income countries. Hypertension during pregnancy accounted for 10.15% of maternal deaths in their study on 14,014 women with MNM. Nathan (6, 7) observed 1% maternal deaths due to pre-eclampsia in their study on 1547 women with pre-eclampsia. There was no maternal death in our study attributable to pregnancy hypertension. It could be due to missing data on very sick women who were referred to higher centres. Moreover, most maternal deaths in poor countries occur outside health system at home or on way to hospital.

In our study most women had one or more complication at the time of admission. 67.7% had proteinuria, 28% had severe hypertension, 15.5% had thrombocytopenia, liver dysfuncytion in 11%, abruption placenta in 4.5%, HELLP syndrome in 3%, retinal detachment in one women (0.5%). 11.5% of women suffered from renal dysfunction. Yiicesoy (8) in their study on 255 women with pregnancy hypertension observed placental abruption in 7.5%, acute renal failure in 2.35%, DIC in 2.35%, pulmonary edema in 0.7%, adult ARDS in 0.39%, retinal detachment in 0.78%, intracranial bleeding in 1.17%. There were three (1.17%) maternal deaths. Similarly Bonsaffoh (2) observed placental abruption in 4.3%, PPH in 5.4%, ARF in 0.5%, HELLP syndrome in 0.8%, admission in ICU in 5.7%,

intracerebral hemorrhage in 0.8%, pulmonary edema in 3% and DIC in 1.9% women. Predicting these complications and timely interventions such as increased surveillance, treatment of symptoms, transfer to higher care facility and delivery when necessary could reduce morbidity and mortality from HDP(1).

Operative delivery is reported to be increased in hypertensive disorders of pregnancy. Vaginal delivery is recommended for severely preeclamptic cases in the absence of obstetric indications for caesarean section. Delivery route was vaginal in 50.5%, 46.5% had caesarean section and 3% had instrumental vaginal delivery in our study. Fetal distress was the commonest indication of caesarean section (43.01%), followed by failed progress in 38.7%, previous caesarean section in 10.75%. Yucesoy (8) observed abdominal delivery rate of 58.8%, fetal distress was the most frequent indication, followed by previous caesarean section. The caesarean rate among women with hypertensive disorders in pregnancy was higher in women with chronic hypertension and pre-eclampsia. Bonsaffoh(2) observed caesarean rate of 45.7%. Nathan (6) observed a caesarean section rate of 69.7%. Thus pregnancy hypertension is an important risk factor for operative delivery and consequently increased morbidity and mortality. One woman (0.5%) had bladder injury during caesarean section.

Fetal complications associated with pre-eclampsia/eclampsia are intra uterine growth restriction, oligohydramnios, preterm delivery, non reassuring fetal heart patterns during labor, low Apgar scores and requirements of neonatal ICU admissio. Pregnancy induced hypertension is an independent risk factor for low birth weight[9]. In our study 45% (90 women) women delivered a SGA baby. There were 16.5% (33) premature deliveries. Yucesoy [8] in his study on 438 women with HDP demonstrated that intrauterine growth restriction, oligohydramnios, placental abruption were the obstetric complication in 29.4%, 19.2%, and 7.5% cases respectively. LBW was observed 40.7% in pre-eclampsia and 14.9% in other hypertensive disorders by Bonsaffoh[10]. Nathan [7] observed preterm births at<34 weeks in 41.7% and at <37 weeks in 70%. Low birth weight is a major determinant of mortality, morbidity and disability in infancy and childhood as well as long term impact on health outcomes in adulthood [8,9,10]

In the present study, still birth and neonatal death rate was 4.5% and 3.5% respectively. So, the PNM is 80/1000. Yiicesoy[8] found PMR of 144/1000 births. Multi [9] observed still birth rate of 5.4% in women with PIH. Bonsaffoh [10] observed 6.8% still births and 3.8% neonatal deaths with PMR of 106/1000 births. Nathan [6] observed 17.7% still birth and 2.5% early neonatal deaths, and 0.8% late neonatal deaths. The still birth rate is higher than the rate of 6.36% in a WHO multi-country survey's [11] still birth rate in pre-eclampsia. This may be attributed to inadequate primary and secondary health care and insufficient resources at referral centres in rural areas with low resources.

Conclusion:-

Hypertensive disorders of pregnancy are associated with increased risk of maternal and perinatal adverse outcome. The complications could be reduced by regular antenatal check up, early identification of hypertension and specialist care.

Abbreviations:

HDP- hypertensive disease of pregnancy

PIH- pregnancy induced hypertension; HELLP- hemolysis, elevated liver enzymes, low platelet count; IUGR- intra uterine growth restriction;LBW- low birth weight; SGA- small for gestational age; NICU- neonatal intensive care unit; ICU- intensive care unit; ARDS- adult respiratory distress syndrome, MNM- maternal near miss

Study limitations:

Short duration of the study coupled with lack of controls is considered limitations of the present study. Therefore, the incidence of the maternal adverse outcomes determined might not reflect true the true population figures. However, the findings will serve as a springboard for larger case-control or longitudinal studies to better understand the relativity of the burden of hypertensive disorders in pregnancy

Competing interest:

The authors of this paper declare no competing interests. This study has not been published elsewhere and is not being considered for publication elsewhere.

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Details of ethics approval: The study was approved the ethics committee of the institution.

Demographics variable		
Age	Number	Percentage
20-25	116	58
26-30	70	35
≥31	14	7
Mean=25.43±3.5S.D		
Gravidity		
PGR	128	
1-3	63	
≥4	9	
Address		
Rural	146	73
Urban	54	27
Socio-economic		
Low	52	26
Mid	119	59.5
Upper	29	14.5
Antenatal care		
Unbooked	110	55
Booked	90	45

Table I:-Demographic profile of women with pregnancy hypertension

Table II:-Clinical presentation, Gestational age on admission, type of hypertensive disorder, and ophthalmoscopy

Clinical presentation	Number	Percentage
Asymptomatic	94	47
Edema	59	29.5
Headache	22	11
Convulsions	16	8
Anemia	15	7.5
Oligohydramnios/IUGR	14	7
Antepartum hemorrhage	9	4.5
Vomiting	5	2.5
Gestational age on admission		
(weeks)		
<34	8	4
34-37	25	12.5
≥37	166	83
Postpartum	1	.5
Mean gestation 38.05±2.16		
Range: 28week 6 days-42 weeks		
Type of hypertensive disorder		
Gestational hypertension	54	27
Pre-eclampsia	125	62.5
Eclampsia	16	8
Chronic hypertension	5	2.5
Fundus changes on		
ophthalmoscopy		
None	161	80.5
Grade I	35	17.5
Grade II	3	1.5
Retinal detachment	1	0.5

Laboratory indicator		
Admission dipstick proteinuria	Number	Percentage
-ve/ trace	65	32.5
1+	41	20.5
2+	39	19.5
3+	34	17
4+	21	10.5
Serum creatinine (mg/dL)		
<.5	17	8.5
>5 - 0.99	160	80
≥1.0	23	11.5
Serum uric acid (mg/dL)		
<4.5	74	37
4.5-6	76	38
>6	50	25
Mean	5.14±1.53 mg/dL	
S. LDH (IU)		
<300	27	13.5
300-600	151	75.5
>600	22	11
Mean	457±299.04 IU	
Platelet count (cells/mm ³)		
≤50,000	2	1
50,000-<100,000	28	14
100,000-150,000	81	40.5
>150.000	89	44.5

 Table III:-Laboratory profile on admission

Table IV:-Maternal complications on admission and patterns of maternal morbidity (N=200)

Maternal complications on	Number	Percentage
admission		
Proteinuria	135	67.5
Severe hypertension	56	28
Thrombocytopenia	31	15.5
Liver dysfunction	22	11
Abruption placenta	9	4.5
HELLP	6	3
Retinal detachment	1	.5
Renal dysfunction	23	11.5
Maternal morbidity		
Blood transfusion	27	13.5
Pyrexia	14	7
Prolonged hospital stay	14	7
Abdominal wound sepsis	12	6
Gaped episiotomy	11	5.5
APH	9	4.5
PPH	5	2.5
Visceral injury	1	.5
Antihypertensive drugs		
None	88	44
One oral drug	79	39.5
Two or more drugs	23	11.5
Injectable anti hypertensives	10	5

Magnesium sulphate use	47	23.5

Table V:-Onset of labour, mode of delivery and caesarean section indications

	N. 1	Demonstration
Unset of labour	Number	Percentage
Spontaneous	92	46
Induced	99	49.5
Elective caesarean section	9	4.5
Mode of delivery		
Normal vaginal delivery	101	50.5
Instrumental vaginal delivery	6	3
Cesarean section	93	46.5
Cesarean section indication (n=93)		
Acute fetal distress	40	43.01
Non progress of labour	36	38.7
Previous caesarean section	10	10.7
Malpresentation	4	4.3
IUGR/Oligohydramnios	4	4.3
Severe PIH	1	1.07
АРН	1	1.07

Table VI:-Neonatal birth weight and Apgar score

Birth weight (gm)	Number	Percentage
<1500	5	2.5
1500-2499	64	32
>2500	131	65.5
Mean weight	2.78±0.52 kg	
Apgar score at 1-minute		
<u>≤</u> 3	17	8.5
4-6	58	29
≥7	125	62.5
Apgar score at 5-minute		
<u>≤</u> 3	14	7
4-6	5	2.5
≥7	181	90.5

Table VII:-Neonatal morbidity and mortality

Neonatal morbidity	Number	Percentage
Low birth weight/SGA	90	45
Birth asphyxia	54	27
NICU admission	45	22.5
Preterm delivery	33	16.5
Neonatal jaundice	20	10
Respiratory distress	5	2.5
Perinatal mortality	16	8
Still births (antepartum	9	4.5
&intrapartum)		
Early neonatal death	7	3.5
Cause of perinatal mortality		
(n=16)		
Abruption placenta	7	43.7
Birth asphyxia	3	18.7
Chronic uteroplacental insufficiency	2	12.5
Septicaemia	2	12.5
Prematurity	1	6.2

RDS	1	6.2

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