NEONATAL OUTCOME OF ANTENATAL MOTHERS WITH PREGNANCY INDUCED HYPERTENSION IN ANTENATAL WARD OF KATHMANDU MEDICAL COLLEGE AND TEACHING HOSPITAL

Shrestha S[1], Paudel S[2], Parajuli P[2], Khagi BR[3]

Affiliation

1. *Assistant Professor, Department of B.Sc.Nursing Programme, Kathmandu Medical College,Kathmandu,Nepal*
2. *Lecturer, Department of B.Sc.Nursing Programme, Kathmandu Medical College,Kathmandu,Nepal*
3. *Assistant Professor, Community Health Nursing, Lalitpur Nursing Campus, Lalitpur, Kathmandu*

ARTICLE INFO

Article History

Received : 18 August, 2017

Accepted : 22 September, 2017

Published : 31 December, 2017

ORA 39

DOI : http://dx.doi.org/10.3126/bjhs.v2i3.18937

**** Corresponding Author***

Ms. Santoshi Shrestha (Pradhan)

Assistant Professor

Department of B.Sc. Nursing

Kathmandu Medical College, Sinamangal, Kathmandu

Citation

Shrestha S, Paudel S, Parajuli P, Khagi BR. Neonatal Outcome of Antenatal Mothers with Pregnancy Induced Hypertension In Antenatal Ward of Kathmandu Medical College and Teaching Hospital. BJHS 2017;2(3)4 255-259.

ABSTRACT

Introduction

Hypertensive disorders seem to complicate approximately 5-15% of pregnancies. Pregnancy induced hypertension (PIH) increases the risk of maternal and perinatal morbidity and mortality.

Objective

To assess the neonatal outcome and to identify the association between the demographic variables and outcome of Pregnancy Induced Hypertension in antenatal ward of Kathmandu Medical College and Teaching Hospital.

Methodology

Prospective study design was conducted for the study in Obstetrics ward of Kathmandu Medical College Teaching Hospital. The population was the 100 antenatal mothers with pregnancy induced hypertension admitted in antenatal ward and purposive convenient sampling technique was used to collect the data. The structured questionnaire was designed and the data was collected through interview technique from 1st February 2014 to 10th March 2016. The collected data was analyzed using SPSS programme.

Results

Regarding neonatal outcome the findings of the study showed that most of the babies 83% had normal weight. The most of the babies 82% had adequate for gestational age. Regarding Apgar score half of the babies 50% scored mild asphyxia at the first minute whereas most of the babies 93% scored no asphyxia at five minutes after delivery. Regarding perinatal outcome 13% babies were delivered premature, 7% had birth asphyxia, 5% were born with low birth weight and stillbirth whereas only 1% had early neonatal death. The present study revealed that there was significant association between gestational age of delivery and apgar score at 5 minutes and there was significant association between age and perinatal management outcome, gestational age of delivery and perinatal morbidity management, grading of proteinuria and perinatal morbidity management, grading of oedema and perinatal management outcome regarding neonatal outcome of pregnancy induced hypertension.

Conclusion

Pregnancy induced hypertension during pregnancy were associated with a higher risk of adverse neonatal outcomes. Women with pregnancy induced hypertension during pregnancy had a higher risk of emergency caesarean section, pre-term birth, neonatal death, low birth weight children and neonates with low Apgar score. Maternal and fetal morbidity and mortality can be reduced by early recognition and institutional management.

KEYWORDS

Neonatal Outcome, Pregnancy Induced Hypertension.

INTRODUCTION

Pregnancy induced hypertension is responsible for high maternal and perinatal morbidity and mortality rates and is one of the main public health problems.[1] According to the Health Ministry, hypertension during pregnancy, depending on the severity level, is considered a risk factor, which, associated with individual characteristics, unfavorable socioeconomic conditions, certain obstetric histories and clinical problems could trigger harms to the maternal-fetal binomial. For the conceptus, the most common consequences associated with hypertension diseases are the restriction of intra-uterine growth, low birth weight, and prematurity.[2]

Pregnancy induced hypertension is a common complication in antenatal women, which is a major cause of maternal and perinatal morbidity and mortality. Perinatal complications include preterm delivery, low birth weight, prematurity, intrauterine foetal death (IUFD), intrauterine growth restriction (IUGR), foetal asphyxia, acidosis, stillbirths and neonatal deaths. Maternal risks associated with gestational hypertension include development of uncontrolled hypertension, superimposed preeclampsia, eclampsia, HELLP syndrome (hemolysis, elevated liver enzymes and low platelets), acute renal and hepatic failure, acute pulmonary edema, cerebrovascular accidents, congestive heart failure, intracranial hemorrhages, proteinuria more than 4-5 grams/day, microangiopathic hemolytic anemia, abruptio placenta, deep vein thrombosis (DVT), occipital lobe blindness, post-partum hemorrhages, disseminated intravascular coagulation (DIC) and /or consumptive coagulopathy.[3]

PIH has been postulated to increase significantly the risk of low birth weight both by increasing preterm birth as well as reducing fetal growth. On the other hand, PIH has been found to be associated with an increased rate of high birth weight and large-for-gestational age babies. These findings suggest that PIH, more specifically preeclampsia, is a heterogeneous syndrome and that preeclampsia may appear in two forms: restricted fetal growth preeclampsia and normal fetal growth preeclampsia.[4]

Pregnancies complicated with hypertension are associated with adverse fetal and maternal outcome in terms of prevalence of intrauterine growth restriction, prematurity, low birth weight, low Apgar score at birth, early neonatal death, high rates of admission to NICU and the need for resuscitation. Perinatal morbidity is increased due to spontaneous preterm labour or iatrogenic preterm induction. Low birth weight due to prematurity/IUGR and fetal hypoxia are the main reasons for NICU admissions and early neonatal death in babies born to mothers with hypertensive disorders of pregnancy. Expectant management with temporizing treatment should be performed to lengthen gestation which may be associated with enhanced perinatal survival. Good intensive care, close monitoring during labor, judicious timing of delivery and NICU facilities is required for better fetal and neonatal outcome in these case.[5]

The prevalence of PIH was high. Women with PIH were at higher risk of adverse pregnancy outcomes than those without. Poor knowledge of management of PIH and inadequate resources are a threat to the proper management of PIH. This underscores the need for human resource capacity building and resource mobilization for proper management of women accessing maternity services. Resources for routine urinalysis must be made available by hospital authorities.[6]

METHODOLOGY

A Prospective research design was adopted and convenience sampling method was applied to meet the objectives of the study. The sample size was admitted 100 antenatal mothers with the diagnosed condition of Pregnancy Induced Hypertension to the department of obstetrics and gynecology. Ethical clearance was taken from the institutional review board of KMCTH. Written informed consent was taken from each respondent. One-on one interview technique was used to collect the relevant data after admission of the respondents using pre-designed structured questionnaire from 1st February 2014 to 10th March 2016. The researcher administered questionnaires were used to capture demographic data, obstetric history and knowledge on PIH management. Records were reviewed for pregnancy outcomes till discharge of the patient while key informants were also interviewed on patient management. The participants were enrolled for the study with following inclusion criteria that women with 20 weeks of gestation and those who willing to participate in this study.

The questionnaires consist of two parts: I. Socio demographic characteristics of the respondents and II. Neonatal Outcome respectively. The data were entered in MS excel. Data were analyzed using SPSS IBM 20 version. Categorical variables were described using frequency distribution and percentages. Continuous variables were expressed by means and standard deviations. Chi-square test was used for analysis of association between the demographic variables with the outcome of Pregnancy Induced Hypertension. P-value of <0.05 was considered statistically significant.

RESULTS

The findings of the study revealed that more than half of respondents (56%) were between the ages of 25-35 years, 36% were between 15-25 years and only 8% were between ages of 35-45 years. Regarding resident majority of respondents (96%) were from urban areas and only 4% were from rural area. Regarding education the majority of the respondents (40%) have completed intermediate level, 24% have completed graduation, 18% have completed secondary level, 10% have completed primary and only 4% have completed post-graduation and another 4% were illiterate. The majority of the respondents (77%) were housewife and 12% of the respondents had Rs.10000-20000 regarding monthly income. Most (91%) of the respondents followed Hindu religion and most 94% were non vegetarian. More than half (56%) of the respondents

were having normal diet and 44% were having low salt diet. Among 100 pregnant mothers, more than half (58%) were from nuclear family and 42% were from joint family.

By gestational majority (69%) of the respondents were above 37 weeks and 31% were below 37 weeks. The majority of the respondents 50% were primigravida, 45% were multigravida and only 5% were grand multigravida. The most of the respondents 93% have done antenatal visit more than 4 times whereas only 7% of the respondents have done antenatal visit less than 4 times. The majority of the respondents 88% had no family history of hypertension and only 22% had family history of hypertension. The most of the respondents 98% were diagnosed of hypertension at third trimester and only 2% of the respondents were diagnosed of hypertension at first and second trimester respectively.

Of the total 100 antenatal mothers, most of the respondents 87% had mild hypertension, 12% had moderate hypertension and only 1% had severe hypertension. The most of the respondents 81% used antihypertensive drugs and only 19% didn't use antihypertensive drugs. The majority of the respondents 80% diagnosed as nil proteinuria, 11% were diagnosed as trace proteinuria, 5% were diagnosed as (+), 3% were diagnosed as (++) and only 1% were diagnosed as more than (++). Regarding grading of edema, the majority of the respondents 62% had absent edema, 36% had mild edema (grade+) 2mm or less and only 2% had moderate edema (Grade++) 2-4mm indent.

The most of the babies 83% had normal weight. The most of the babies 82% had adequate for gestational age. Regarding Apgar score half of the babies 50% scored mild asphyxia at the first minute whereas most of the babies 93% scored no asphyxia in five minutes after delivery. Regarding perinatal outcome 13% babies were delivered prematurity, 7% had birth asphyxia, 5% were born with low birth weight and stillbirth whereas only 1% had early neonatal death.

Among the total neonates, 25% were admitted in NICU whereas only 2% neonates were admitted in general ward. Regarding perinatal management outcome, 24% of the neonates has improved whereas only 2% neonates were expired.

There was no any significant association with weight at birth and classification of weight according to gestational age regarding neonatal outcome of pregnancy induced hypertension. There was significant association between gestational age of delivery and Apgar score at 5 minutes regarding neonatal outcome of pregnancy induced hypertension.

There was significant association between age and perinatal management outcome, gestational age of delivery and perinatal morbidity management, grading of proteinuria and perinatal morbidity management, grading of oedema and perinatal management outcome regarding neonatal outcome of pregnancy induced hypertension.

Table : 1 Neonatal Outcomes related to weight, weight according to gestational age, apgar score and perinatal outcome regarding Pregnancy Induced Hypertension (n=100).

Variables	Category	Frequency	Percentage (%)
Weight at birth	Low birth weight (below2.5 kg)	17	17.0
	Normal weight (above 2.5 kg)	83	83.0
Weight according to gestational age	Adequate for gestational age High for gestational age	1	1
	Low for gestational age	17	17.0
Apgar score at the first minute	Severe asphyxia (0-3)	4	4.0
	Mild asphyxia (4-6)	50	50.0
	No asphyxia (7-10)	46	46.0
Apgar score in five minutes	Severe asphyxia (0-3)	3	3.0
	Mild asphyxia (4-6)	4	4.0
	No asphyxia (7-10)	93	93.0
	Prematurity	13	13.0
	Birth asphyxia	7	7.0
Perinatal Outcome	LBW	5	5.0
	Stillbirth	5	5.0
	Early Neonatal Death	1	1.0

Table 2 : Association between demographic variables with weight at birth and classification of weight according to gestational age regarding pregnancy induced hypertension.

Characteristics	Category	Weight at birth (in grams)		P value	Classification of weight according to gestational age			P value
		Low birth weight (below 2.5 kg)	Normal weight (above 2.5 kg)		Adequate	High	Low	
Age	15-25 years	6	30		30	0	6	
	25-35 years	10	46	0.929	46	1	9	0.882
	35 45 years	1	7		6	0	2	
	Total	17	83		82	1	17	
Resident	Rural	1	3		3	0	1	
	Urban	16	80	0.664	79	1	16	0.894
	Total	17	83		82	1	17	
Education	Literate Illiterate	1 16	3 80	0.664	3 79	0 1	1 16	0.894
	Total	17	83		82	1	17	
Food Pattern	Vegetarian	2	5		4	0	2	
	Non Vegetarian	15	78	0.499	78	1	15	0.836
	Total	17	83		82	1	17	

Table 3 : Association between demographic variables with Apgar score regarding neonatal outcome of pregnancy induced hypertension.

Characteristics	Category	Apgar score at 1 minute		P value	Apgar score at 5 minutes		P value
		No asphyxia	Asphyxia		No asphyxia	Asphyxia	
Age	15-25 years	16	20	0.828	35	1	0.083
	25-35 years	27	29		52	4	
	35-45 years	3	5		6	2	
	Total	46	54		93	7	
Resident	Rural	4	0	0.235	4	0	0.575
	Urban	89	7		89	7	
	Total	93	7		93	7	
Education	Literate	1	0	0.421	2	2	
	Illiterate	8	13		30	66	
	Total	9	13		32	68	
Occupation	Business	2	2	0.784	4	0	0.308
	Private employee	8	7		13	2	
	Government employee	1	3		3	1	
	Housewife	35	42		73	4	
	Total	46	54		93	7	
Religion	Hindu	40	51	0.525	84	7	0.863
	Buddhist	3	2		5	0	
	Christian	2	1		3	0	
	Other	1	0		1	0	
	Total	46	54		93	7	

Food Pattern	Vegetarian	3	3	0.640	5	1	0.613
	Non Vegetarian	43	51		88	6	
	Total	46	54		93	7	
Dietary Pattern	Low salt diet	22	22	0.477	40	4	0.468
	Normal diet	24	32		53	3	
	Total	46	54		93	7	
Gestational age of delivery	Preterm	13	18	0.585	26	5	0.016
	Term	33	36		67	2	
	Total	46	54		93	7	
Gravidity Distribution	Primi	24	26	0.693	46	4	0.794
	Multi	19	26		42	3	
	Grand Multi	3	2		5	0	
	Total	46	54		93	7	
Number of antenatal visits	< 4 times	5	2	0.162	7	0	0.452
	> 4 times	41	52		86	7	
	Total	46	54		93	7	
Family hypertension	Yes	11	11	0.132	20	2	0.538
	No	35	43		73	5	
	Total	46	54		93	7	
Severity of hypertension	Mild (140-159/90-99)	40	47	0.628	81	6	0.947
	Moderate (160/179/100.109)	6	6		11	1	
	Severe (≥180/≤110	0	1		1	0	
	Total	46	54		93	7	
Antihypertensive drugs used	Yes	34	47	0.247	74	7	0.414
	No	12	7		19	0	
	Total	46	54		93	7	
Grading of proteinuria	Nil	36	44	0.492	75	5	0.435
	Trace	5	6		10	1	
	+	4	1		5	0	
	++	1	2		2	1	
	More than ++	0	1		1	0	
	Total	46	54		93	7	
Grading of Oedema	Absent	30	32	0.200	60	2	0.127
	Mild (Grade+)2mm or less	14	22		31	5	
	Moderate (Grade++)2-4mm indent	2	0		2	0	
	Total	46	54		93	7	

Table 4 : Association between demographic variables with Perinatal Morbidity Management and Perinatal Management Outcome regarding neonatal outcome of pregnancy induced hypertension.

Characteristics	Category	Perinatal Morbidity Management		P value	Perinatal Management Outcome			P value
		NICU admission	General ward admission		Improved	Other complications	Expired	
Age	15-25 years	7	29	0.508	35	1	0	0.500
	25-35 years	15	41		54	0	2	
	35-45 years	3	5		8	0	0	
	Total	25	75		97	1	2	
Resident	Rural	1	3	1.00	3	0	1	
	Urban	24	72		94	1	1	
	Total	25	75		97	1	2	
Education	Literate	1	3	1.000	4	0	0	0.938
	Illiterate	24	72		93	1	2	
	Total	25	75		97	1	2	
Occupation	Business	1	3	0.707	4	0	0	0.988
	Private employee	4	11		15	0	0	
	Government employee	0	4		4	0	0	
	Housewife	20	57		74	1	2	
	Total	25	75		97	1	2	
Religion	Hindu	24	67	0.684	89	1	1	0.185
	Buddhist	1	4		4	0	1	
	Christian	0	3		3	0	0	
	Other	0	1		1	0	0	
	Total	25	75		97	1	2	
Food Pattern	Vegetarian	1	5	0.745	6	0	0	0.994
	Non Vegetarian	24	70		91	1	2	
	Total	25	75		97	1	2	
Dietary Pattern	Low salt diet	8	36	0.163	42	0	2	0.187
	Normal diet	17	39		55	1	0	
	Total	25	75		97	1	2	
Gestational age of delivery	Preterm	15	16	0.000	29	0	2	0.084
	Term	10	59		68	1	0	
	Total	25	75		97	1	2	
Gravidity Distribution	Primi	12	38	0.728	48	1	1	0.890
	Multi	11	34		44	0	1	
	Grand Multi	2	3		5	0	0	
	Total	25	75		97	1	2	
Number of antenatal visits	< 4 times	3	4	0.258	7	0	0	0.890
	> 4 times	22	71		90	1	2	
	Total	25	75		97	1	2	
Family hypertension	Yes	6	16	0.308	21	0	1	0.850
	No	19	59		76	1	1	
	Total	25	75		97	1	2	
Severity of hypertension	Mild (140-159/90-99)	21	66	0.219	85	0	2	0.104
	Moderate (160/179/100-109)	3	9		11	1	0	
	Severe (≥180/≤110)	1	0		1	0	0	
	Total	25	75		97	1	2	
Antihypertensive drugs used	Yes	23	58	0.243	78	1	2	0.948
	No	2	17		19	0	0	
	Total	25	75		97	1	2	
Grading of proteinuria	Nil	16	64	0.038	79	1	0	0.111
	Trace	3	8		10	0	1	
	+	3	2		4	0	1	
	++	2	1		3	0	0	
	More than ++	1	0		1	0	0	
	Total	25	75		97	1	2	
Grading of Oedema	Absent	13	49	0.407	61	0	1	0.000
	Mild (Grade+)2mm or	11	25		36	0	0	

DISCUSSION

Hypertensive disorders of pregnancy have been identified as a major worldwide health problem, associated with increased perinatal morbidity and mortality. Studies have shown that hypertensive disorders of pregnancy predispose women to acute or chronic uteroplacental insufficiency, there by having an effect on perinatal and neonatal outcome that may result in antenatal or intrapartum anoxia that may lead to foetal death, intrauterine growth retardation and preterm delivery. Some studies have shown that there is an increased incidence of caesarean sections in the mothers with PIH, and increased incidence of birth asphyxia, transient tachypnoea of newborn (TTNB), hyaline membrane disease (HMD) and neonatal sepsis in newborns of these mothers.[7]

The present study showed that, 5% of mother had stillbirth whereas only 1% was early neonatal death. This present study is similar with the study regarding pregnancy induced hypertension and the neonatal outcome conducted in the governmental maternity hospital in São Paulo city, Brazil in 2008 revealed that the frequency of stillbirths was 5.8% and 0.8% of early neonatal death.[8]

The present study revealed that 54% of the babies had birth asphyxia at one minute whereas only 7% had birth asphyxia at 5 minutes respectively. This study is contrast with the study conducted regarding Neonatal Outcome in Hypertensive Disorders of Pregnancy in a Tertiary Neonatal Unit, Soba University Hospital, Khartoum, Sudan revealed that only 8.6% of the babies had birth asphyxia during delivery.[9]

The present study showed that 25% of the babies were admitted in NICU and only 2% babies were admitted in general ward which is similar with the study conducted regarding the study of fetal outcome in hypertensive disorders of pregnancy in a tertiary care maternity hospital of Delhi showed that 25% of the babies were admitted in NICU respectively.[10]

Moreover, the present study revealed that 82% of the babies had adequate for gestational age, 17% had low for gestational age and only one percentage had high for gestational age. This present study is similar with the study conducted regarding neonatal mortality and morbidity in pregnancy induced hypertension in Niloufer Institute of Child Health showed that 76.13% had adequate gestational age, 21.59% had small for gestational age and this study is in contrast with the result that only 2% had low for gestational age respectively.[11]

There was significant association between age and perinatal management outcome, gestational age of delivery and perinatal morbidity management, grading of proteinuria and perinatal morbidity management, grading of edema and perinatal management outcome regarding neonatal outcome of pregnancy induced hypertension. On contrary to this, the study conducted regarding Pregnancy Induced Hypertension and Associated Factors among Pregnant Women showed that there was significant association between pregnancy induced hypertension and with age group, education and occupation.[12]

CONCLUSION

PIH is a common complication in antenatal women and is a major cause of maternal and foetal, morbidity and mortality. The present study concluded that there is rise of prematurity, birth asphyxia, low birth weight and still birth. There is significant association between gestational age of delivery and Apgar score at 5 minutes regarding neonatal outcome of pregnancy induced hypertension. The study highlights the importance of institutional deliveries of women combined with effective antenatal care. Hence health education and awareness among the people and primary health workers regarding this health issue is necessary in bringing down the maternal and neonatal morbidity and mortality.

RECOMMENDATIONS

Pregnant women with pregnancy induced hypertension should be encouraged to adhere to reduction of dietary sodium intake. Continuous teaching needs to be provided on PIH self-care knowledge to pregnant women with pregnancy induced hypertension. The client teaching should include the importance of weight reduction and relevance of obesity in worsening PIH.The study should be replicated with a larger sample to foster generalizability of the findings beyond the present study sample.

LIMITATION OF THE STUDY

Limitations reflect the relatively small group of pregnant women, which limit our ability to draw firm conclusions on the magnitude of adverse events. The setting was Urban so the findings couldn't be generalizable in rural cities and community settings.

ACKNOWLEDGEMENT

We are thankful to the Department of Obstetrics of Kathmandu Medical College Teaching Hospital for helping us in carrying out this research project. And we are also thankful to the patients without whom this study would not have been possible.

CONFLICT OF INTEREST

There was no any conflict of interest to declare.

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