

## HYPERTENSIVE DISORDERS OF PREGNANCY AND ITS OUTCOME IN A TERTIARY CARE HOSPITAL

Uddin AW<sup>1</sup>, Nessa S<sup>2</sup>, Chowdhury S<sup>3</sup>, Banu M<sup>4</sup>**Abstract**

**Introduction:** Hypertensive disorders of pregnancy seem to be one of the major causes of maternal morbidity and mortality leading to 10-15% of maternal deaths specially in developing world. Pregnancies complicated with hypertensive disorders are associated with increased risk of adverse foetal, neonatal and maternal outcome including preterm birth, Intrauterine Growth Retardation (IUGR) and perinatal death.

**Objectives:** The objective of the study was to determine the hypertensive disorders and its outcome.

**Methods:** The observational study was conducted on 63 randomly selected patients admitted in the inpatients department of Gynaecology and Obstetrics at the Institute of Child and Mother Health, Matuail, Dhaka from 1st November 2010 to 30th January 2011.

**Results:** Among the study subjects 46% were within 19-25 years of age. 79.4% had preeclampsia, 14.3% had eclampsia and 6.3% were found to be as gestational hypertension. Among the study patients 50.8% were of single parity and 61.9% had no antenatal checkups, 25.4% were delivered before 37 completed weeks of pregnancy and 50.8% were delivered by Caesarean section. Regarding pregnancy outcome there was one case of still birth. Intra-uterine growth retardation had 33.3% and 44.4% had low birth weight (<2.2 kg).

The study found significant association between booking status and convulsion ( $p=0.03$ ). Patients who were not booked had higher rates of convulsion. There was also significant association between hypertensive disorders and mode of delivery ( $p=0.015$ ).

**Conclusion:** Caesarean section is the applicable mode of delivery in most of the patients with hypertensive disorders of pregnancy.

**Key-words:** Hypertensive disorders of pregnancy, Maternal deaths, Preterm birth, Perinatal death, Intrauterine growth retardation, Caesarean section.

**Introduction**

Every year nearly 5,29,000 women die globally due to pregnancy related causes. For each death nearly 118 women suffer from life threatening events or severe acute morbidity<sup>1</sup>.

Hypertensive disorders of pregnancy seem to be one of the major causes of maternal morbidity and mortality leading to 10-15% of maternal deaths specially in developing world<sup>2</sup>. World Health Organization estimates that at least one woman dies every seven minutes from complications of hypertensive disorders of pregnancy<sup>3</sup>. Pregnancies complicated with hypertensive disorders are associated with increased risk of adverse foetal, neonatal and maternal outcome including preterm birth, Intrauterine Growth Retardation (IUGR), and Perinatal death<sup>4,5,6,7,8,9</sup>.

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Five classes of hypertensive disorders were identified according to the latest classification system described by National High Blood Pressure Education Working group (2000) including chronic hypertension, pre eclampsia, eclampsia, pre eclampsia superimposed on chronic hypertension and gestational hypertension<sup>4</sup>. Differentiating between these groups is mandatory regarding the determination of best management strategies.

The incidence and prevalence of hypertensive disorders of pregnancy vary from one country to another and might have some genetic predisposition. These disorders account 6.4% of deliveries in African Americans and 4.8% in other women in United States of America<sup>5</sup>. Prevalence in North West Saudi Arabia is 3/100 deliveries<sup>10</sup>, it is 7.49 in India<sup>11</sup>. Literature review reveals that there is much work done on this subject in western world whereas very few research studies done in South East Asia region especially in Bangladesh. The aim of this research study is to determine the frequency and distribution of hypertensive disorders of pregnancy, and to determine the impact of this potentially devastating disorder on maternal and fetal outcome at Institute of Child and Mother Health, Matuail, Dhaka, Bangladesh.

### Materials & Methods

The study was a descriptive type cross sectional study. The target population was the pregnant women aged between 17 to 35 who have been diagnosed as having hypertensive disorders of pregnancy. The sample population were patients who attended the hospital and was diagnosed with different hypertensive disorders of pregnancy and was admitted in inpatients department for treatment and gave consent to participate in the study. The study was conducted in Institute of Child and mother Health, Matuail, Dhaka. It is a tertiary care teaching hospital for Gynecology and Obstetrics and is a leading national Institute for research. The study was conducted from 1st November 2010 to 30th January 2011. Sample size was calculated using the following formula:

$$n = z^2 p q / d^2$$

n = number of sample to be studied

z = 1.96 at 95 % confidence interval

p = prevalence of hypertensive disorders of pregnancy

q = 1-p

d = 5 % margin of error

Sample size was estimated based on the fact that prevalence of hypertensive disorders of pregnancy to be 6%.

$$\begin{aligned} \text{Therefore } n &= (1.96)^2 \times 0.06 \times 0.94 / (.05)^2 \\ &= 86.6 \end{aligned}$$

The patients were selected randomly. After the patients were admitted in inpatients department, they were selected as sample patients when they satisfied the inclusion criteria and gave informed consent to participate. A structured questionnaire were used. The questionnaire was developed focusing on the general and specific objectives. The prepared questionnaire was pre tested among 10 pregnant women with hypertensive disorders of pregnancy and necessary corrections were made after feedback. The corrected final questionnaire was used along the entire study period. The data were collected on working days from 9 am to 2 pm from the inpatients department of Obstetrics and Gynecology, ICMH by face to face interview. The clinical features during admission and relevant investigation findings were collected from patient profile documentation file during the interview. The crude data were collected and checked for consistency. Then the consistent data were transferred to SPSS version 17 programme. The data then were analyzed according to general and specific objectives. Quality control of data was maintained by eliminating bias which was possible by adopting simple random sampling.

### Results

Among the study subjects 46 % were within 19-25 years of age. 79.4 % had pre eclampsia, 14.3 % had eclampsia and 6.3% were found to be as gestational hypertension. Among the study patients 50.8 % were of single parity and 61.9% had no antenatal check ups 25.4% were delivered before 37 completed weeks of pregnancy and 50.8% were delivered by Caesarean section. Regarding pregnancy outcome there was one case of still birth. Intra uterine growth retardation had 33.3% and 44.4 % had low birth weight (< 2.2 kg). The study found significant association between booking status and convulsion (p=0.030). Patients who were not booked had higher rates of convulsion. There was also significant association between hypertensive disorders and mode of delivery (p=0.015).

**Table-I:** Distribution of the respondents by the mode of delivery. (n=63)

Mode of delivery	Frequency	Percentage
Normal vaginal delivery	24	38.1
Induction and delivery	4	6.3
Vaccum Extraction	3	4.8
Caesarean Section	32	50.8
<b>Total</b>	<b>63</b>	<b>100</b>

**Table-II:** Distribution of the respondents according to outcome of delivery. (n=63)

Delivery Outcome	Frequency	Percentage
Live birth	41	65.1
Fresh still birth	1	1.6
Intrauterine growth retardation	21	33.3
<b>Total</b>	<b>63</b>	<b>100</b>

**Table-III:** Relationship between booking status and diagnosed convulsion among the pregnant women.

Booking status	Convulsion		Total	P Value
	Present	Absent		
Booked	0	24	24	<b>0.03</b>
Not booked	9	30	39	
<b>Total</b>	<b>9</b>	<b>54</b>	<b>63</b>	

<sup>2</sup> value 4.714 after Yates correction

**Table-IV:** Relationship between hypertensive disorders of pregnancy and mode of delivery. (n=63)

Diagnosis	Mode of Delivery				Total	P Value
	Normal vaginal delivery	Induced labor	Vacuum extraction	Cesarean section		
Gestational hypertension	3	0	0	4	7	<b>0.015</b>
Pre eclamptic toxemia	18	4	3	22	47	
Eclampsia	0	0	0	9	9	
<b>Total</b>	<b>24</b>	<b>4</b>	<b>3</b>	<b>32</b>	<b>63</b>	

<sup>2</sup> value 15.85 after Yates Correction

**Table-V:** Relationship between hypertensive disorders and perinatal outcome. (n=63)

Diagnosis	Outcome of Delivery			Total	P value
	Live birth	Fresh still birth	Intra uterine growth etardation		
Gestational hypertension	1	0	3	4	<b>0.005</b>
Preeclamptic toxemia	38	0	12	50	
Eclampsia	2	1	6	9	
<b>Total</b>	<b>41</b>	<b>1</b>	<b>21</b>	<b>63</b>	

<sup>2</sup> value 14.76 after Yates Correction

## Discussion

Hypertensive disorders of pregnancy are considered to be a major worldwide health problem running an increased risk of perinatal and maternal mortality. This study shows 46 % patients belong to the younger age group (19-25 yrs). This finding is consistent with study conducted by Eskenazi and Fenster in Arizona teaching hospital in USA who reported young maternal age to be a risk factor for developing hypertensive disorders<sup>12,13,14</sup>. However Nusrat and Ahsan in their study from Hyderabad, India did not find any significant association with maternal age and hypertensive disorders of pregnancy<sup>15</sup>. It was observed in study that hypertensive disorders were significantly high i.e. 54% in women with lower socio-economic status. Similar results were reported by Yucesory and Ozlcam<sup>16</sup> from Romania in their study in 2005.

According to obstetric history, 50.8% patients were of single parity (primigravida). This finding is consistent with a study conducted by Brown and Higgins<sup>5</sup> in Tasmania, Australia in 2000. However, Ghamdi et al in a similar study conducted in Damam, KSA in 1999 reported 30.3% of patients to be primigravida while 46% grand multiparous (para>5) and concluded multiparity to be a risk factor for developing hypertensive disorders<sup>10</sup>. The study demonstrates out of 63 respondents 61.9 % were not booked while only 38.1 % were booked. Out of the booked patients only 28.6 % had 4 or more antenatal checkups. Most of them (54%) had only one checkup denoting their poor excess to

antenatal care. A similar study by Saftlas et al from USA in 1990 supported our findings and concluded with an observation that hypertensive disorders of pregnancy were significantly high in women having poor access to antenatal care<sup>12</sup>.

We determined the different classes of hypertensive disorders of pregnancy and found that 79.4% had Pre eclamptic toxemia, 14.3% had Eclampsia and 6.3% had Gestational Hypertension. There is association between booking status and convulsion ( $p=0.03$ ). This result is similar to the study<sup>11</sup> conducted by Prakash J from Varanasi, India in 2006 who reported Pre eclamptic toxemia 44.44% and Eclampsia 6.94%.

Regarding mode of delivery, 50.8% had caesarean section and a significant statistical association was found ( $p=0.015$ ) between different types of hypertensive disorders of pregnancy and mode of delivery. Similar data were found in Sao Paulo Hospital where the global occurrence of Caesarean section was 73.3%, reaching to 82% in hypertensive women<sup>17</sup>. On the other hand in Umata General Hospital, the prevalence of Caesarean Section among hypertensive women<sup>18</sup> was 30.2%. In this study we found 65.1% live birth, 33.3% Intra uterine growth retardation and still birth frequency was only 1.6%. There is significant association ( $p=0.005$ ) between hypertensive disorders during pregnancy and perinatal outcome. This finding is consistent with the outcomes found in a retrospective cohort study by Mayes d among 1308 hypertensive pregnant women in USA. From the Australian society of the study of hypertension in pregnancy, about 23% of children of mothers with pre eclampsia are small for gestational age<sup>19</sup>. However Eskes Tk in his study from France in 2000 reported foetal loss to be as high as 38% in first hypertensive pregnancy<sup>20</sup>. Considering newborns birth weight 44.4% had low birth weight ( $< 2.2$  kg). It may be due to the fact that 25.4% were delivered preterm ( $< 37$  completed weeks of pregnancy), which is a common complication of hypertensive disorders either due to spontaneous delivery or to the obstetricians conduct of interrupting the pregnancy due to compromised foeto maternal health. In a similar study Prakash J from Varanasi, India reported low birth weight<sup>11</sup> to be 61.1%.

## Conclusion

Hypertensive disorders of pregnancy are common in younger age group (19-25) belonging to lower socio-economic class. Among the different hypertensive disorders pre eclampsia is the commonest and occurring in patients who had fewer ante natal checkups or poor access to ante natal care. Significant association was found between hypertensive disorders during pregnancy and mode of delivery. 100% of the eclamptic patients needed caesarean section. One third (33.3%) of the newborns born to hypertensive mothers are growth retarded and 44.4% had low birth weight ( $< 2.2$  kg) during birth. Significant association was found between hypertensive disorders during pregnancy and with perinatal outcome. In a time when Bangladesh is on the track of achieving Millennium Development Goals (MDG) 4 and 5, we should emphasis on more institutional delivery with a 24 hours operational emergency obstetric care service (EmOC) and more ante natal care coverage with more Skilled Birth Attendant (SBA) in order to Identify the high risk pregnancies at risk of developing hypertensive disorders during pregnancy. bacterial flora in assessing suitability for grafting.

## References

1. Waterston M, Bewley S, Wolfe C. Incidence and predictors of severe obstetric morbidity: case control study. *BMJ* 2001; 322: 1089-93.
2. Vigil- De Gracia P, Montufar-Rueda C, Ruiz J. Expectant management of severe preeclampsia and preeclampsia superimposed on chronic hypertension between 24 and 34 weeks gestation. *Eur J Obstet Gynecol Reprod Biol* 107: 24-7.
3. Dadelszen P V, Magee L. What matters in preeclampsia are the associated adverse outcomes: the view from Canada. *Current opinion in obstetrics and gynecology* 2008; 20: 110-5.
4. National High Blood Pressure Education Program Working group. Report of the National High Blood Pressure Education Program working group on High Blood Pressure in pregnancy. *Am J Obstet Gynecol* 2000; 183:S1-S22.

5. Brown MA, Hague WM, Higgins J. The detection, investigation and management of hypertension in pregnancy: full consensus statement. *Aust N Z J Obstet Gynecol* 2000; 139-55.
6. Bellamy L, Casas JP, Hingorani AD, Williams DJ. Preeclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis. *BMJ*.2007; 335:974-7.
7. Matthys LA, Coppage KH, Lambers DS, Barton JR, Sibai BM. Delayed postpartum preeclampsia: an experience of 151 cases. *Am J Obstet Gynecol* 2004; 190:1464-6.
8. Chen XK, Wen SW, Smith G, Yang Q, Walker M. Pregnancy-induced hypertension is associated with lower infant mortality in preterm singletons. *BJOG*. 2006; 113(5):544-51.
9. Long PA, Abell DA, Beischer NA. Parity and preeclampsia. *Aust NZJ Obstet Gynaecol* 1989; 19:203-6.
10. Saeed M.G. Al -Ghamdi , Ali S , Abdulla K . Hypertensive disorders of pregnancy: Prevalence, Classification and Adverse Outcomes in NorthWestern Saudi Arabia. *Annals of Saudi Medicine* 1999; 19(6):557-60.
11. J Prakash, LK Pandey , AK Singh , BKar . Hypertension in pregnancy: Hospital Based Study. *JAPI* April 2006;vol 54.
12. Saftlas A , Olson d , Franks AL, Atrash HK, Podras P. epidemiology of preeclampsia and eclampsia in the United States 1979-86. *American journal of Obstetrics and Gynaecology* 1990; 163:460-5.
13. Berkowitz KM. Insulin resistance and Pre eclampsia clinics in perinatology1998;25:873-85.
14. Eskenazi B, Fenster L, Sidney S. A multivariate analysis of risk factors for pre eclampsia . *JAMA* 1991; 226:237-41.
15. Nusrat N, Ahson M, Ahmed S. H.yperntensive disorders of pregnancy: Frequency , Maternal and Foetal Outcomes . *JAPI* 2010;103: 85-8.
16. Yucesoy G, Ozkan S, Bodur H Tan T, Caliskan E, Vural B, Coraker A. Maternal and perinatal outcome in pregnancies complicated with hypertensive disorders of pregnancy: a seven year experience of tertiary care centre. *Arch Gynecol Obstet* 2005;27(1): 43-9.
17. Xiong X, Mayes D, Demianczuk N, Davidge ST, Newburn-cookC, Saunders LD. Impact of pregnancy induced hypertension on foetal growth. *Am J Obstet Gynecol*. 1999; 180(1):207-13.
18. Solange regina Perfetto Chaim, Sonia Maria junqueria Vasconcellos de Oliveria, Amelia fumiko Kimura. Pregnancy induced hypertension and the neonatal outcome. *Acta Paul Enfem* 2008; 21(1):53-8.
19. Brown MA, Hague WM, Higgins J, Lowe S, McCowan L, Oats J, Peek MJ , Rowan JA , Walters BN; Australian society of the study of Hypertension in Pregnancy . The detection, investigation and management of hypertension in pregnancy: full consensus statement. *Aust NZJ Obstet Gynaecol* .2004; 40(2): 139-55.
20. Eskes TK, Leon C chesley. Hypertension in pregnant women-EUR *J Obstet Gynaecol ReprodBiol* 2000; 90:181-6.