



Research Article

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Pregnancy Induced Hypertension and Associated Factors among Pregnant Women



Sarker Shamima Ahmed¹, Nazma Sultana^{2*}, Most Luthy Begum³, Lobaba Sultana Lima⁴, Md Firoz Abedin⁵ and Md Kausar Hosen⁶

¹Department of Community Medicine, Tairunnessa Memorial Medical College & Hospital, Bangladesh

²Ad-din Medical College & Hospital, Bangladesh

³Northern University Bangladesh, Bangladesh

⁴American International University, Bangladesh

⁵Department of Zoology, Jogonmath University, Bangladesh

⁶Lalmonirhat Sadar Hospital, Bangladesh

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***Corresponding author:** Nazma Sultana, Medical Officer, Ad-din Medical College & Hospital, Bangladesh, Email: gpadb17@gmail.com

Abstract

Pregnancy induced hypertension is a burning issue in terms of maternal mortality and morbidity not only in Bangladesh but also worldwide. Actually it is risk factor for both mother and child. This cross sectional hospital based study was conducted to assess prevalence of pregnancy induced hypertension and its determinants among pregnant women attending teaching hospital in third trimester. Non probability purposive sampling was used to collect sample. Structured questionnaire was used to collect data. Face to face interview was taken as well as medical record was checked. Average age of the respondent's 26.03±5.77 years. More than half of the respondents completed SSC level education. Average income of the respondent's was 33100.00±76135.29 BDT. Three-fourth of the respondents had family history of hypertension. More than half of the respondents (64%) suffered from moderate anemia. Average ANC visit was 4.43±1.58. Multipara, primipara and nullipara were 63%, 33% and 4% respectively. Underweight, normal, overweight and obese were 4%, 28.50%, 26.50% and 41%. The prevalence of pregnancy induced hypertension was 7.5%. Statistical significant association was found between pregnancy induced hypertension and socioeconomic status. Further large scale depth study can be conducted to get more precise result.

Keywords: Pregnancy induced hypertension; Associated factors

Introduction

Pregnancy is a physiological phenomenon for most women. However, some develop problems during its evolution, putting both the mothers and the conceptus health at stake [1]. Gestational hypertension is the most common cause of hypertension in pregnant women. Gestational hypertension is a clinical diagnosis defined by the new onset of hypertension (systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg) at ≥ 20 weeks of gestation in the absence of proteinuria or new signs of end-organ dysfunction [2]. The blood pressure readings should be documented on at least two occasions at least four hours apart. Gestational hypertension is severe when systolic blood pressure is ≥ 160 mmHg and/or diastolic blood pressure is ≥ 110 mmHg on two consecutive blood pressure measurements at least four hours apart [3-5]. Gestational hypertension is one of the maternal diseases that causes the most detrimental effects to the maternal, fetal, and neonatal organisms. This disease is

responsible for high maternal and perinatal morbidity and mortality rates, and is one of the main public health problems [6,7]. 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 [8]. The hypertensive syndromes of pregnancy are the leading cause of maternal and fetal morbidity and mortality in the developed world [9,10], occurring in around 8% of pregnancies. Hypertensive syndromes are also a cause of perinatal morbidity and mortality, mainly from intrauterine growth restriction due to utero-placental insufficiency and complications related to prematurity [11]. Even mild hypertension is associated with greater risk for prematurity and newborns who are small for gestational age [12]. Despite the severity of disease of both

preeclampsia and gestational hypertension, differences in risk factors between severe preeclampsia and gestational hypertension may increase controversies over expectant versus aggressive treatment, and there is insufficient literature on Asian women with preeclampsia and gestational hypertension regarding the issue of maternal complications [13]. Recent studies have indicated higher risk of PIH among women with family history of hypertension, previous history of pregnancy induced hypertension, pre-existing diabetes, gestational diabetes mellitus, maternal age ≥ 40 years, multiple pregnancies, nulliparity, and pre-pregnancy obesity [14]. Some prior studies have suggested that higher pre-pregnancy body mass index is associated with increased risk of gestational hypertension and pre-eclampsia [15]. Gestational hypertension is still a little-understood entity. Hypertensive disorders in pregnancy are common and their incidence appears to be increasing. Gestational hypertension is an abnormality causing striking maternal, fetal and neonatal mortality and morbidity both in developed and developing countries. Gestational hypertension is found in 5-10% of pregnancies in the world. Increase in caesarean section, abruption of premature placenta, preterm delivery, low birth weight, stillbirth, acute renal failure, and intravascular coagulation were more frequently observed in women who developed hypertensive disorders of pregnancy. The crude prevalence of systolic and diastolic hypertension in pregnancy in rural area of Bangladesh was 6.8% and 5.4%, respectively. It is proved that gestational hypertension and low birth weight is well linked. So prevalence of gestational hypertension among pregnant women in Bangladesh context specially urban based study in a teaching hospital is an urgent need.

Materials and Methods

This cross sectional study was conducted at conveniently selected at Ad-din Medical College & Hospital, Keraniganj, Dhaka. This area was purposively selected to get adequate sample. Study was run for three months from 1st September, 2016 to 30th November, 2016. Non probability convenient sampling method was used on the basis of inclusion and exclusion criteria. The study was mainly based on primary data. It consists of both data gathered by structured and semi structured questionnaires and in depth interviews with Bangladeshi women. The socioeconomic scenarios of the respondents were obtained. Blood pressure was measured by investigator herself. Medical records were also verified. The respondents were selected consecutively who meet the inclusion and exclusion criteria. Data were collected by interviewer administered questionnaires. Questionnaires was comprised of several topics, including socio-demographic background (age, educational status, occupation, monthly income, etc.), blood pressure status and BMI. After data collection, data were sorted and scrutinized by me and then data were analyzed by SPSS version 20.0 program. The open ended questions were grouped and categorized. Data were analyzed by descriptive statistics and inferential statistics.

Results

Table 1: Age group distribution of the respondents (n=200).

Age in years	Frequency	Percentage
17-23	66	33
24-30	113	56.5
31-37	8	4
38-43	13	6.5
Mean \pm SD	26.03 \pm 5.77	

Table shows that mean age of the respondent's 26.03 \pm 5.77 years. More than half of the respondents represented 24-30 years age group followed by 17-23 years 33%, 31-37 years 4% and 38-43 years 6.5%.

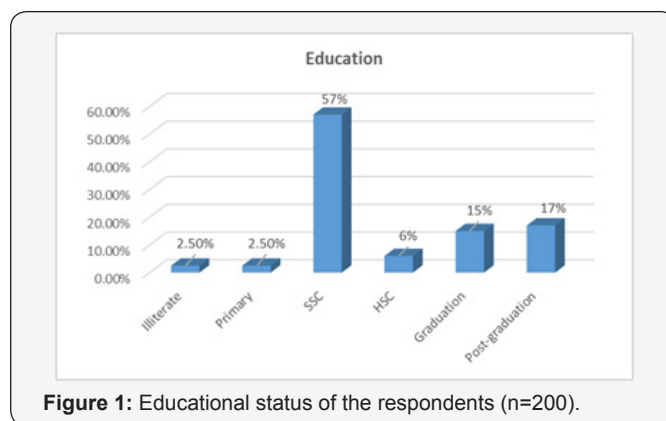


Figure 1: Educational status of the respondents (n=200).

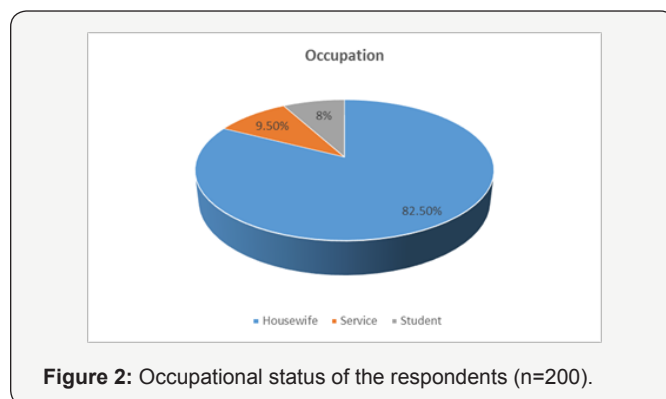


Figure 2: Occupational status of the respondents (n=200).

Table 2: Monthly income of the respondents (n=200).

Monthly income	Frequency	Percentage
5000-19999	90	45
20000-34999	59	29.5
35000-49999	30	15
50000-64999	16	8
≥ 65000	5	2.5
Mean \pm SD	33100.00 \pm 76135.29	

Table shows that average income of the respondent's was 33100.00 \pm 76135.29 BDT. About 45%, 29.5%, 15%, 8% and 2.5% respondents had monthly income 5000-19999 BDT, 20000-34999 BDT, 35000-49999 BDT, 50000-64999 BDT and ≥ 65000 BDT.

Table 1 shows that mean age of the respondent's 26.03 \pm 5.77 years. More than half of the respondents represented 24-30 years age group followed by 17-23 years 33%, 31-37 years 4% and 38-

43 years 6.5%. More than half of the respondents completed SSC level education followed by post-graduation 17%, graduation 15%, HSC 6%, primary 2.50% and illiterate 2.50% (Figure 1). Housewife, service and student were 82.50%, 9.50% and 8% respectively (Figure 2). Table 2 shows that average income of the respondent's was 33100.00±76135.29 BDT. About 45%, 29.5%, 15%, 8% and 2.5% respondents had monthly income 5000-19999 BDT, 20000-34999 BDT, 35000-49999 BDT, 50000-64999 BDT and ≥65000 BDT. Three-fourth of the respondents had family history of hypertension whereas one-fourth had no family history of hypertension (Figure 3). Almost 98% respondents had no previous history of pregnancy induced hypertension whereas 2% had previous history of pregnancy induced hypertension (Figure 4). Six percent pregnant women had history of both pregnancy induced hypertension and gestational diabetes (Figure 5). This doughnut shows 98% had no history of pre-eclampsia (Figure 6). More than half of the respondents (64%) suffered from moderate anemia followed by mild anemia 32% and severe anemia 4% (Figure 7). Table 3 shows Average ANC visit was 4.43±1.58. Most of the respondents (72%) visited ANC >4 times. Table 4 shows Prevalence of pregnancy induced hypertension was 7.5%. Statistical significant association was found between pregnancy induced hypertension and age group ($p=0.006<0.05$) (Table 5). Table 6 shows Statistical significant association was found between pregnancy induced hypertension and education ($p=0.001<0.5$). Table 7 shows Statistical significant association was found between pregnancy induced hypertension and occupation ($p=0.021<0.05$).

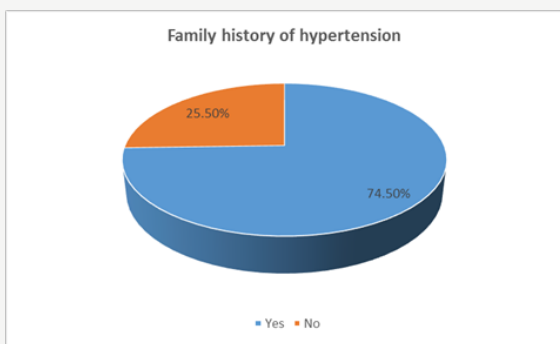


Figure 3: Family history of hypertension (n=200).

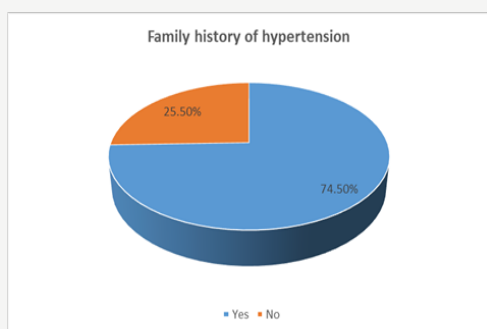


Figure 4: Previous history of pregnancy induced hypertension (n=200).

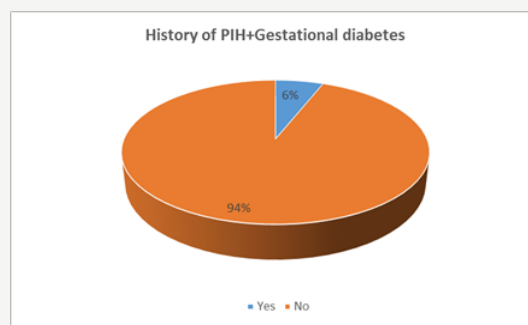


Figure 5: History of pregnancy induced hypertension and gestational diabetes (n=200).

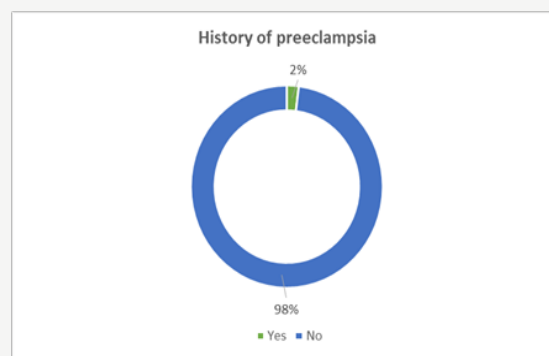


Figure 6: History of pre-eclampsia (n=200).

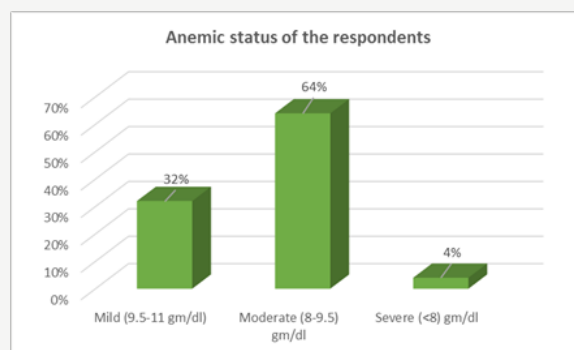


Figure 7: Anemic status of the respondents (n=200).

Table 3: Number of ANC visit of the respondents (n=200).

ANC Visit	Frequency	Percentage
≤4	56	28
>4	144	72
Mean±SD	4.43±1.58	

Average ANC visit was 4.43±1.58. Most of the respondents (72%) visited ANC >4 times.

Table 4: Prevalence of pregnancy induced hypertension (n=200).

PIH	Frequency	Percentage
Yes	15	7.5
No	185	92.5

Prevalence of pregnancy induced hypertension was 7.5%.

Table 5: Association between pregnancy induced hypertension and age group.

Variables	Pregnancy Induced Hypertension		Total	X ²	P Value
	Yes	No			
	n(%)	n(%)			
Age group					
17-23	0(0)	66(33)	66(33)	12.48	0.006
24-30	15(7.5)	98(49)	113(56.5)		
31-37	0(0)	8(4)	8(4)		
38-43	0(0)	13(6.5)	13(6.5)		

Statistical significant association was found between pregnancy induced hypertension and age group (p=0.006<0.05).

Table 6: Association between pregnancy induced hypertension and education.

Variables	Pregnancy Induced Hypertension		Total	X ²	P Value
	Yes	No			
	n(%)	n(%)			
Education					
Illiterate	0(0)	5(2.5)	5(2.5)	23.43	0.0001
Primary	0(0)	5(2.5)	5(2.5)		
SSC	2(1)	112(56)	114(57)		
HSC	0(0)	12(6)	12(6)		
Graduate	5(2.5)	25(12.5)	30(15)		
Postgraduate	8(4)	26(13)	34(17)		

Statistical significant association was found between pregnancy induced hypertension and education (p=0.001<0.5).

Table 7: Association between pregnancies induced hypertension and occupation.

Variables	Pregnancy Induced Hypertension		Total	X ²	P Value
	Yes	No			
	N (%)	N (%)			
Occupation					
Housewife	10(5)	155(77.5)	165(82.5)	7.69	0.021
Student	4(2)	12(6)	16(8)		
Service	1(0.5)	18(9)	19(9.5)		

Statistical significant association was found between pregnancy induced hypertension and occupation (p=0.021<0.05).

Discussion

Pregnancy induced hypertension is thought to be one of the major causes of maternal death and sufferings all over the country. This study was conducted to know prevalence of pregnancy induced hypertension in third trimester in a teaching hospital. The prevalence of the hypertensive disorders in pregnancy was 7.5% in this study but 21.6% and 17.2% that had been reported from south-eastern Nigeria and Finland, respectively [16,17]. However, it was greater than 10% and 11.6% that had been reported from Ibadan and Benin City [18,19]. The factor that may be responsible for the low prevalence of hypertensive

disorder in our hospital could be due to time constraint and small sample size. In this study, history of preeclampsia was 2%. This disagrees with the 5-10% prevalence of other studies carried out in Lagos, Ibadan, Calabar, Kano and other parts of the world [20-24]. The age and parity distribution of the cases in this study were also similar to those in other reports [25,26]. A positive family history of hypertension was found to be a significant risk factor for developing HDP in this study. Women whose mothers suffered from PIH were three times more likely to develop PIH than other women [27,28]. Three-fourth of the respondents had family history of hypertension whereas one-fourth had no family history of hypertension. Multiple pregnancy, gestational diabetes and previous history of preeclampsia were significant risk factors for developing HDP. This findings were same as in other studies [29,30]. These are consistent with the hypothesis that immune maladaptation might play a role in triggering the development of HDP. Almost 98% respondents had no previous history of pregnancy induced hypertension whereas 2% had previous history of pregnancy induced hypertension. Most of the respondents (96%) did not have history of gestational diabetes. It was also found that BMI >27kg/m² was associated significantly with the risk of the development of HDP. It has been observed that obese women were more likely to have increased levels of serum triglycerides, very low-density lipoproteins and formation of small, dense low-density lipoprotein particles. Such lipid alterations have been suggested to promote oxidative stress, caused by either ischaemia-reperfusion mechanism or activated neutrophils and lead to endothelial cell dysfunction [31]. More than half of the respondents (64%) suffered from moderate anemia followed by mild anemia 32% and severe anemia 4%. Underweight, normal, overweight and obese were 4%, 28.50%, 26.50% and 41%. Statistical significant association was found between pregnancy induced hypertension and socioeconomic status. A prospective study conducted by Bener and Saleh revealed that obesity increased the odds of developing PIH by 10 times [32]. Obesity among women in Zimbabwe has increased from 1.2% in 2005 to 15.1% in 2010 [33,34]. Other studies have also shown that obesity is a risk factor for PIH [35,36] hence if such women were to become pregnant, they would be at higher risk of developing PIH. Compared to the recommendations by the World Health Organization (WHO), the caesarean section delivery rate of 12.5% is above the recommended cut off. WHO recommends caesarean section rates between 5% and 10% and rates of 15% are considered to do more harm than good. Literature suggests that cesarean section rates higher than the proposed 15% upper threshold are associated with increased morbidity and mortality for both mothers and babies [37]. A population-based retrospective cohort study conducted in Zhejiang province in China in 1995-2000 demonstrates the importance of use of cesarean section during delivery among women with PIH. It was found that moderate and severe PIH early developed during pregnancy could increase the risk of perinatal mortality while the cesarean delivery could decrease the risks in women with PIH [38]. In our study, however, it was

not noted that among the reasons for caesarean section. Possible selection bias among women recruited into this study cannot be ruled out. The study was conducted over a short period of time thus we could have missed essential characteristics among women who did not get the chance to be part of this study.

Conclusion

The prevalence of pregnancy induced hypertension was 7.5%. Average age of the respondent's 26.03±5.77 years. More than half of the respondents completed SSC level education. Average income of the respondent's was 33100.00±76135.29 BDT. Three-fourth of the respondents had family history of hypertension. More than half of the respondents (64%) suffered from moderate anemia. Average ANC visit was 4.43±1.58. Statistical significant association was found between pregnancy induced hypertension and age group, education and occupation.

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