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Original Research Article

Evaluation of knowledge, awareness, treatment and prevention towards pregnancy induced hypertension among the pregnant women in Bangladesh: a hospital based cross-sectional study

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ABSTRACT

Background: Pregnancy induced hypertension (PIH) is one of the major causes of maternal and neonatal morbidity, mortality and premature birth. 99% of the maternal deaths is occurring in developing countries like Bangladesh. Almost 12% of the maternal deaths is associated with hypertensive disorders such as PIH in pregnancy. It can be prevented by proper knowledge, awareness of the disease and its complications. We investigated the knowledge, awareness of PIH and its related factors during pregnancy among the pregnant women in Tangail, Bangladesh.
Methods: A descriptive cross-sectional study among 200 pregnant women in between March 2021 to June 2021 was conducted by using a questionnaire at Sheikh Hasina Medical College Hospital (SHMC) of Tangail district, Bangladesh. Factors associated with the knowledge and awareness of PIH were investigated separately using Chi square test.
Results: In this study, 92.5% of the pregnant women had heard about PIH and 10.5% pregnant women had PIH. Age group 30-35, >35 and post graduate respondents were more knowledgeable and aware than others about PIH and urban respondents were highly knowledgeable and aware to PIH compare to rural respondents. The age of the respondents, area of residence, educations, occupations, socioeconomic status were found to be significantly associated with PIH knowledge and awareness.
Conclusions: The study result showed that there is need to increase public knowledge and awareness about PIH. Health educational programs throughout the rural and urban areas need to be intensified to reduce PIH-related deaths among the pregnant women in Bangladesh.

Keywords: Pregnancy induced hypertension, Knowledge, Awareness, Bangladesh

INTRODUCTION

Pregnancy induced hypertension (PIH) is a pattern of high blood pressure during pregnancy.[1] It is a leading cause of maternal and perinatal mortality and can also lead to long-term health problems like chronic hypertension, kidney failure, or nervous system.[2] Generally, it is responsible for 76,000 and 5,00000 of maternal and infant deaths respectively in each year.[3] The World Health Organization (WHO) estimates that, about 3,58,000 women die every year from pregnancy related complication. 99% of the maternal deaths is occurring in developing countries like Bangladesh. Almost 12% of the maternal deaths is associated with hypertensive disorders such as PIH during pregnancy. Centers for Disease Control and Prevention (CDC) recently reported, hypertensive disorders accounted for 6.6% of deaths during pregnancy, 9.3% of deaths within 42 days of pregnancy, and 5.4% of deaths is happening between 42 days and 1 year.[4,5]

Women with hypertension are at high risk of cardiovascular diseases, and renal diseases. The treatment

of PIH depends upon on blood pressure levels, gestational age, presence of symptoms and associated risk factors. When systolic blood pressure (SBP) ranges between 140-149 mmHg and diastolic blood pressure (DBP) between 90-99 mmHg, in this case non-drug management is recommended. Blood pressure thresholds for drug management in pregnancy vary between different health's organizations. Commonly used medicine for PIH treatment are hydralazine, methyldopa and labetalol.[6,7]

Many studies reported that hypertension is caused by overweight, obesity, diabetes, gestational diabetes and kidney diseases, chronic hypertension and maternal age. The knowledge of the most important risk factors in the population could be useful to identify the patients who have higher chances to develop the hypertensive disorders and subsequently adequate prenatal care could contribute to decrease this mortality ratio. However, reports designed to identify risk factors for hypertensive disorders of pregnancy in Bangladesh are scarce.[8-10]

Lack of education, sufficient antenatal care, and proper health maintains, poverty and nutrition, 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. In Bangladesh, it has increased an exceptionally high rate of maternal mortality due to preventable reasons, in a country with a high population density. There is an insufficient maternal treatment in developing countries like Bangladesh. The coverage of prenatal care (minimum 1 visit) in Bangladesh is only 48.7%. The overall scenario can be improved by early detection of PIH associated factors and taking proper initiatives nationally.[11]

Therefore, the objective of the study was to determine the knowledge, attitude and practices of PIH and its related factors during pregnancy in Tangail city, Bangladesh.

METHODS

Study area and study design

A descriptive cross-sectional study was carried out among <20 to >35 aged 200 pregnant women admitted and outdoors patient in Sheikh Hasina Medical College, Tangail, Bangladesh in the period of March 2021 to June 2021. The respondents were given an explanation of the objectives and benefits of the study. Before the interview, a written consent was taken from the respondents according to the WHO and Bangladesh Medical Research Council (BMRC) guidelines of ethical consideration. Respondent's right to refuse and withdraw from study any time was accepted. Confidentiality of the respondents was strictly maintained. As a part of the population-based program, the pregnant women's knowledge, awareness, treatment and prevention levels of PIH including proportion of PIH among pregnant women, risk factors, early warning signs, practicing early detection methods, and therapeutic approaches were evaluated in this study.

Sample size calculation and inclusion criteria

Sample size was calculated using the following formula for the pregnant women to be enrolled into the study.

$$n = \frac{P(1-P) \times Z^2}{d^2}$$

The above equation was calculated to give n = 126.

Where Z=1.96 for 5% level of significance, P=PIH prevalence among the pregnant women in Bangladesh: 0.09 based on a previous report, and d=margin of error: 0.05.[12]

This showed that study sample needs to contain at least 126 respondents in order to keep the level of confidence at 95% with a margin of error of 5%. This was then multiplied by the design effect of 1.56, as we used respondent driven sampling technique. A non-response rate of 3% i.e. 3.78 respondents were also considered and adding this our final estimated sample size was 200 which was considered adequate to fulfill the objectives of our study.

The women who were pregnant with on or above 20 weeks of gestation admitted in the Sheikh Hasina Medical College, Tangail, Bangladesh and who sought outdoor service of the same centre were enrolled as study participants. Respondents were approached by interviewers at various times of the day during data collection. Respondents who were failed to respond to all questions and who left before completing the interview were excluded.

Questionnaire content

Data were collected via a structured questionnaire for this study which was derived from the literature review of the previous peer-reviewed published studies.[13,14] The study questionnaire was first developed in English and translated into Bengali after which translation accuracy was verified by an independent bilingual translator.

The questionnaire was divided into 8 distinct sections. The first section consisted of 6 questions that covered the socio-demographic profile of the respondents. The second section also consisted of 4 questions that covered the health status of pregnant mother. The section three, on the other hand, had four questions that covered nutritional lifestyle of pregnant mother. The section four consisted of six questions on knowledge about PIH while the fifth-section covered five questions on personal risk factors for PIH. The section six consisted of four questions on hereditary risk for PIH and section seven consisted of two questions on knowledge about PIH treatment. The last section composed of five questions that covered the awareness on prevention and management of PIH. The type of questions

in the eight sections were either closed-ended questions with 'yes', 'no', 'don't know', or multiple-choice questions.

Cronbach's Alpha was used to assess the reliability coefficient which is a measure of the internal consistency of the questionnaire. The Cronbach's alpha coefficient was 0.723 for the questionnaire except section 2, age (Q-1), body mass index (BMI) (Q-21) where the value >0.7 is considered acceptable.[15]

Measurements of height and weight

SECA 361 model weighing scale was measured the body weight after removal of shoes, heavier clothes and pocket content. Body height was measured to the nearest 1 cm after removal of the shoes.

Measurement of BMI

Body mass index (BMI) defined as the body weight divided by square of the body height. The formula of BMI=kg/m^2 was used Where kg was person's weight in kilograms and m^2 was person's height meters square. The ranges of BMI were considered by following, underweight (>18.5 kg/m^2), normal weight (18.5 to 25), overweight (25 to 30), and obesity (>30).

Measurement of the blood pressure (BP)

The standard protocol for measuring BP recommended by the WHO was maintained to study respondents and ALPK2 blood pressure monitor, Japan was used for this purpose. BP was measured in millimeters of mercury (mm Hg) and recorded with systolic number first, followed by the diastolic number and ≤120/80 was considered a normal BP.

Operational definition

Hypertension in pregnancy was defined as the SBP and DBP were on or above systolic and diastolic 140 mmHg and 90 mmHg respectively.

Statistical analysis

Each filled questionnaire was checked, and coded individually at the end of interview. Care was taken to confirm the accuracy and uniformity of the data. Then the statistical analysis for the study were performed using the statistical package for social science (SPSS statistics for window, version 23. Microsoft word and Microsoft excel were used for tabular charts and graphical representation. Descriptive statistics such as frequency and percentages were calculated for categorical variables (e.g. gender and living place) with their respective 95% confidence interval. The association between aware and preventing ways, and knowledge of PIH were measured using chi square test. P values of <0.05 were considered significant.

RESULTS

Socio-demographic characteristics

The majority of the respondents 51 (25.5%) were in the age group of (29-35) years, followed by 48 (24%) in (24-29) and 45 (22.5%) in the age group of (>35) years. About 57% of respondents were urban residents while 25.5% hadn't any formal education. The majority (64%) were belonged to middle class families and 72% were multigravida (Table 1).

Table 1: Socio-demographic characteristics of the respondents (n=200).

Variables	Frequency	Percentage (%)
Age (in years)		
<20	22	11
20-24	34	17
24-29	48	24
29-35	51	25.5
>35	45	22.5
Area of residence		
Rural	86	43
Urban	114	57
Educational status		
Illiterate	51	25.5
Primary	50	25
Secondary	17	8.5
Intermediate	20	10
Graduate	25	12.5
Post graduate	37	18.5
Occupational status		
Job holder	93	46.5
Housewife	107	53.5
Socio economic status		
Low	58	29
Middle	128	64
High	14	7
Gravida		
Primigravida	56	28
Multigravida	144	72

Health status of pregnant mothers

The mean of height of pregnant mother was 5 feet 1.5 inches and the majority (34%) was 5 feet while the mean of weight was 59.7 kg and the majority (21.5%) was 60 kg. The mean of BMI of pregnant mother was 24.875 kg/m^2 and the majority (6%) was 25.6 kg/m^2. Based on BMI 95 (47.5%) pregnant mothers were over-weighted when 1 had obesity. On the other hand, in accordance with systolic and diastolic BP, 21 (10.5%) pregnant mothers had PIH. About 36 (18%) pregnant mothers had diabetes while 27 (13.5%) reported they had cardiac diseases (Table 2).

Table 2: Health status of pregnant mothers (N=200).

Variables	Maximum percent-age (%)	Feet/kg/ (kg/m^2)/ mmHg	Mean
Height	34	5	5.125
Weight	21.5	60	59.7
BMI	6	25.6	24.875
Systolic BP	44	120	124.44
Diastolic BP	44.5	80	81.18
	Frequency (n=200)	**Percen-tage (%)**	
Normal weight	104	52	
Overweight	95	47.5	
Obesity	1	0.5	
PIH	21	10.5	
Diabetes	36	18	
Cardiac disease	27	13.5	

Knowledge and awareness about PIH and its treatment

There were 67% pregnant women had heard about the PIH while 33% pregnant woman hadn't heard of that. 26% respondents were stated PIH can be started before pregnancy but 23.5% believed that PIH can be started after 20 weeks of pregnancy. About 62.5% pregnant women were known to sign and symptoms of PIH conversely 37.5% pregnant women weren't known to sign and symptoms of PIH. More than half of the respondents (51.5%) were knowledgeable about complications of PIH when less than half of the respondents (48.5) hadn't knowledge about that. Around 60% pregnant women knew about the treatment of PIH but near to 40% didn't know about the treatment of PIH. Close to half of the respondents (49.5%) had knowledge about the side effect of PIH drugs but less than half of the respondents (49%) hadn't knowledge about the side effect of PIH drugs. 51.5% pregnant mother believed that PIH can be prevented while 28% did not so and 20.5% said they don't know about that. In question of regular exercise can prevent PIH, near to half of the pregnant mothers (48%) were agreed but 26% weren't agreed though 26% pregnant mothers did choose "don't know" option.

Around 49.5% respondents were stated losing excess body weight before conception can prevent PIH but 24% weren't stated so and 26.5% didn't know about that. More than half of the pregnant mothers (56%) knew about any management of PIH conversely 17.5% didn't know so while 26.5% pregnant mothers were stated they don't know about any management of PIH (Table 3).

Sources of information about PIH

There were multiple sources from which the pregnant women acquired information about PIH.

Among the 200 pregnant women, there were 36% who had heard about PIH from the source of health facility, 46% had heard about PIH from the source of media, 70% pregnant women had known from personal experience, 6% had heard from friends, 6% had known from women development group, 21% had heard from the source of health promotional persons and 15% were unknown about pregnancy induced hypertension (Figure 1).

Table 3. Knowledge and awareness about PIH and its treatment (N=200).

Variables	Frequency (n=200)	Percentage (%)
Ever heard about PIH		
Yes	134	67
No	66	33
When can PIH starts		
Before pregnancy	52	26
After 20 weeks of pregnancy	47	23.5
Before and during pregnancy	3	1.5
Don't know	98	49
Know any sign and symptoms of PIH		
Yes	125	62.5
No	75	37.5
Knowledge about complications of PIH		
Yes	103	51.5
No	97	48.5
Knowledge about PIH treatment		
Yes	119	59.5
No	81	40.5
Knowledge about side effect of PIH drugs		
Yes	99	49.5
No	98	49
Don't know	3	1.5
PIH can be prevented		
Yes	103	51.5
No	56	28
Don't know	41	20.5
Regular exercise can prevent PIH		
Yes	96	48
No	52	26
Don't know	52	26
Losing excess body weight before conception can prevent PIH		
Yes	99	49.5
No	48	24
Don't know	53	26.5
Know any management of PIH		
Yes	112	56
No	35	17.5
Don't know	53	26.5

Factors associated with knowledge and awareness about PIH

There was significant association between socio-demographic factors (i.e. maternal age, area of residence, educations, occupational status, and socio economic status) and knowledge on PIH. Age >35 and post graduate pregnant mothers were more knowledgeable than others about PIH while urban pregnant mothers were highly known to PIH compare to rural pregnant mothers. So, there was a strongly positive relationship between sociodemographic factors and knowledge on PIH (Table 4).

On the other hand, there was also a significant association between sociodemographic factors (i.e. maternal age, area of residence, educations, occupational status, and socio economic status) and awareness on PIH.

Age group 30-35, >35 and post graduate pregnant mothers were more aware than others about PIH while urban pregnant mothers were highly aware to PIH compare to rural pregnant mothers.

So, there was also a strongly positive relationship between socio-demographic factors and awareness on PIH (Table 5).

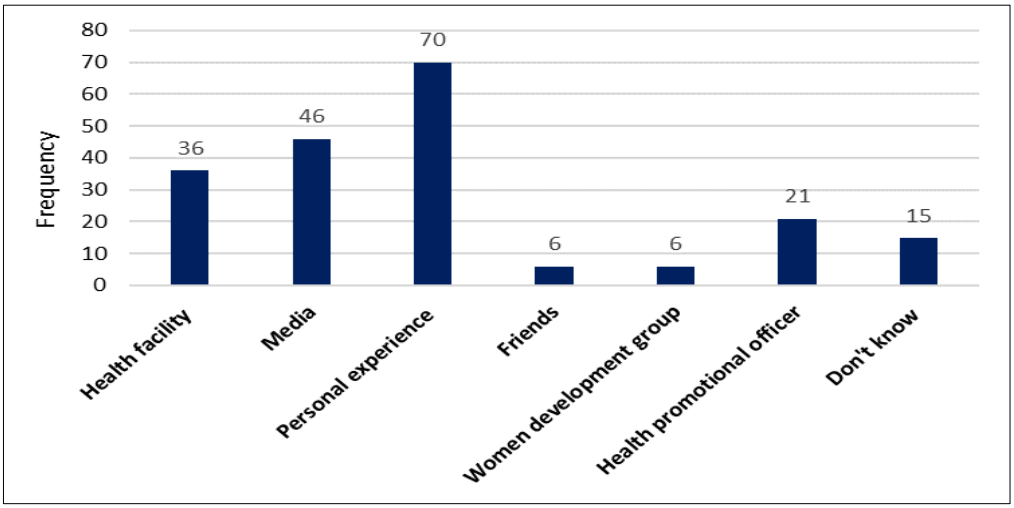

Figure 1: Sources of information about PIH.

Table 4: Relationship of sociodemographic factors to respondents' knowledge on PIH.

Variable	Knowledge on PIH (Q15, Q19, Q20)		Chi square	P value
	Yes	No		
Age				
<20	8	14	19.618	0.001**
20-24	11	23		
24-29	24	24		
30-35	25	26		
>35	35	10		
Area of residence				
Rural	41	45	25.486	0.000**
Urban	93	21		
Educational status				
Illiterate	14	37	72.712	0.000**
Primary	27	23		
Secondary	15	2		
Intermediate	19	1		
Graduate	24	1		
Post graduate	35	2		
Occupational status				
Job holder	68	25	8.362	0.004**
Housewife	57	50		
Socio economic status			13.139	0.001**

Continued.

Variable	Knowledge on PIH (Q15, Q19, Q20)		Chi square	P value
	Yes	No		
Low	19	39		
Medium	78	50		
High	6	8		

**P value is significant at less than 0.05 level

Table 5: Relationship of sociodemographic factors to respondents' awareness on PIH.

Variable	Awareness on PIH (Q33, Q34, Q35)			Chi square	P value
	Yes	No	Don't know		
Age					
<20	3	12	7		
20-24	9	10	15	42.045	0.000**
24-29	18	17	13		
30-35	33	10	8		
>35	33	3	9		
Area of residence					
Rural	25	30	31	25.358	0.000**
Urban	74	18	22		
Educational status					
Illiterate	12	15	24		
Primary	11	14	25		
Secondary	12	3	2	97.174	0.000**
Intermediate	17	2	1		
Graduate	23	1	1		
Post graduate	37	0	0		
Occupational status					
Job holder	65	14	14	15.180	0.001**
Housewife	47	21	39		
Socio economic status					
Low	20	15	23		
Medium	81	17	30	18.974	0.001**
High	11	3	0		

**P value is significant at less than 0.05 level

DISCUSSION

The aim of this study was to determine the knowledge, awareness, practices and factors associated with the PIH among the pregnant women.

The finding was in line with similar studies conducted in Kerbala Hospital of Iraq town where the pregnant participant heard about PIH was 81.7% while (18.3%) of the participants had not heard about it. The main source of knowledge by the participants was from (70%) followed by health care providers (25.3%), media 9.1%, school/university 2.1%.[1]

The study found that there was a significant association between maternal age, area of residence, educational status, occupations, socio economic status, and knowledge on PIH respectively. Similarly, there was also a significant association between maternal age, area of residence, educational status, occupations, socio economic status, and awareness about PIH respectively. Several studies revealed that lacking of knowledge, lacking awareness, and the risk factors are strongly responsible for pregnancy induced hypertension in different parts of the world which were similar with the study findings.[16-21] Some risk factors had been commonly reported in the developed countries while others were common to the developing countries.[22,23] Since the cause of PIH is not clear, primary prevention largely depends on the identification of its risk factors, increasing knowledge and awareness about PIH. In this study, women with a family history of hypertension were at a significantly increased level of PIH. It was also found that BMI >27 kg/m^2, height and weight were associated significantly with the risk of the development of PIH.

This study summarizes that large number (92.5%) of the pregnant respondents had heard about PIH and their source of information was relatives, friends, health promotional officer, and media. Majority of pregnant respondents had poor knowledge, awareness, prevention practices and management of PIH. Other problems identified that could lead to hypertension among pregnant mothers were poor health education to pregnant mothers, poor roads and

insecurity, poverty, long distance to health facilities, harassment by the health workers, unaffordable health services and hereditary risk factors. Statistically significant association was found between socio demographic factors and knowledge, awareness respectively on PIH. Early detection and timely management of PIH, knowledge and awareness about PIH and its risk factors at antenatal care would improve maternal and perinatal health.

CONCLUSION

Though this study didn't cover the whole country, it represents the exact scenario of Bangladeshi women. It is evident that some factors such as education, residential area, and socio-economic status are the main obstacles of being aware about PIH. In rural area Bangladeshi women are not getting proper formal education and diagnostic or health care facilities. Lacking of knowledge and awareness about PIH along with unavailable diagnostic and treatment facilities are the major reason for PIH-related death. This is high time to turn the table by frequently organizing educational programs on PIH awareness throughout rural and urban areas. Surely, awareness would lead to early detection and diagnosis, therefore, will improve the odds of survival and cure with simpler and more cost-effective treatment.

Recommendations

Based on our study finding there are some recommendations to get the proper improvement on PIH among the pregnant women as follows: there is need for improving the knowledge of pregnant women about PIH by health education programs and instruction booklets throughout the wards of the hospital; encourage earlier booking visit in the first 12 weeks of pregnancy.; all pregnant women should avoid the junk foods and initiate timely management of PIH; government should encourage health education on causes and prevention of the PIH and its complications; pregnant mothers should take the antenatal care very seriously; pregnant mothers should be encouraged to deliver in the hospital; encourage paramedical staff to involve continuing educational program in shape of workshops, training programs, conferences for improving nursing care about PIH to get better mothers and neonate's health; and government should provide enough health facilities and health workers regarding PIH management.

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