

Study of Risk Factors for Pregnancy Induced Hypertension (A Hospital Based Case Control Study)

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Abstract: Hypertension disorders of pregnancy are important leading causes of maternal, fetal and neonatal morbidity and mortality worldwide. Hypertension during pregnancy is classified under five categories; they are chronic hypertension, preeclampsia, chronic hypertension with preeclampsia, gestational hypertension (Pregnancy Induced Hypertension-PIH) and transient hypertension. The present study was initiated as undergraduate student study to determine the risks factors of pregnancy induced hypertension. **Method:** The present case-control study was conducted during July 2016 to Oct 2016 at tertiary care hospital. The study population is selected from the hospital OPD. There were total 100 pregnant women selected for the study. There were selected on first come first basis. There were 50 women with PIH and 50 women without PIH selected for the study. The cases were selected from list of Obstetric OPD and matched control were also selected form same department. The socio-demographic matched case and control selected in equal number 1 : 1 ratio. **Results:** The women with PIH and without PIH, both groups were matched for their background information. It was found that there was no association with primipara and multipara with PIH (Odds – 1.7 95% CI – 0.68 to 4.30). Menstrual history had also no association with present PIH condition (OR- 0.5 95% CI- 0.2 to 1.6). Family history of hypertension (OR-1.9 95% CI- 0.8 to 4.8) and family history of diabetes mellitus (OR-1.5 95% CI- 0.61 to 3.7) also had not association with present PIH. Past history of PIH had strong association with current PIH for women who are multigravida (OR-3.7 95% CI- 1.1 to 12.5 p=0.03). Also there was interesting observation that vegetarian had higher chance of getting PIH then mixed diet pattern (OR-4.3 95% CI- 1.8 to 10.4 p=0.0009). **Conclusion:** The various risk factors were studies among PIH women and non-PIH women as case control study. The risk factors which present study have identified, they were past history of PIH and vegetarian diet. Others need to explore in larger community based study. [Sorohi H_ NJIRM 2017; 8(3):49-52]

Key words: PIH, case-control study, vegetarian diet, previous PIH, hospital study

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Background: Hypertension disorders of pregnancy are important leading causes of maternal, fetal and neonatal morbidity and mortality worldwide.¹ Hypertension during pregnancy is classified under five categories; they are chronic hypertension, preeclampsia, chronic hypertension with preeclampsia, gestational hypertension (PIH) and transient hypertension.² Gestational hypertension is also known as Pregnancy induced hypertension; is defined as new hypertension in a pregnant women after 20 weeks of gestation without the presence of protein in urine or other signs of preeclampsia and blood pressure of 140 mmHg systolic or diastolic pressure of 90 mmHg measured 2 times with at least a 6 hours interval.²

A study conducted at tertiary center reported PIH was third important cause of mortality among maternal deaths.³ In China it was reported second most common cause of maternal mortality.⁴ This condition PIH may complicate to preeclampsia or eclampsia. Preeclampsia, also referred to as toxemia, is a condition that pregnant women develop. It is marked by high blood pressure in women who have previously

not experienced high blood pressure. Preeclamptic women will have a high level of protein in their urine and often also have swelling in the feet, legs, and hands. This condition usually appears late in pregnancy, generally after the 20 week of pregnancy. These conditions leads to maternal complications like eclampsia, abruptio placentae, cerebrovascular events, organ failure and disseminated intravascular coagulation.³ PIH and eclampsia have risk of delivering low birth weight baby also.⁵

India is one of the country where still the maternal mortality rate is high, which is 174 per 1,00,000 live birth.⁶ Although PIH more commonly occurs during first pregnancies, it can also occur in subsequent pregnancies. There are various risk factors for PIH reported DC Dutta's textbook of obstetrics⁷ which are elderly primipara, family history of hypertension, obesity, vascular disorders and placental abnormalities.

Looking to the scenario the present study was initiated as undergraduate student study to determine the risks factors of pregnancy induced hypertension.

Research Question: What are the risk factors playing role among PIH women in a case control study in tertiary hospital in Vadodara?

Methods: The present case-control study was conducted during July 2016 to Oct 2016 at tertiary care hospital near Vadodara Gujarat. This is a 1200 bed hospital attached medical college and catering services to central Gujarat and MadhyaPradesh areas. The study population is selected from the hospital OPD. There were total 100 pregnant women selected for the study. There were selected on first come first basis. There were 50 women with PIH and 50 women without PIH selected for the study. The case was defined as a pregnant woman who is registered at respective hospital and diagnosed as PIH. Pregnancy induced hypertension was defined as new hypertension in a pregnant women after 20 weeks of gestation without the presence of protein in urine or other signs of preeclampsia and blood pressure of 140 mmHg systolic or diastolic pressure of 90 mmHg measured 2 times with at least a 6 hours interval. The cases were selected from list of Obstetric OPD and matched control were also selected from same department. The socio-demographic matched case and control selected in equal number 1 : 1 ratio.

The inclusion criteria for cases were women in the antenatal period and diagnosed by an Obstetrician as being PIH without sever complication and taking OPD services. The inclusion criteria for control women in the antenatal period without pregnancy induced hypertension. The exclusion criteria were subjects who did not give their consent and those who were seriously ill were excluded from the study.

After taking permission of institutional ethics committee the project was started. The study was conducted at outpatient department of Obstetrics & Gynecology of Hospital. Before collecting data, informed written consent was obtained from all the study participants. The study is conducted by undergraduate students under guidance of faculty. All students were trained for data collection and pilot pre-tested proforma used for data collection.

Selected participants were informed about study details and consent was taken. There were 50 cases of PIH and 50 age matched controls selected. The selected participants were interviewed with taking individual history of hypertension and risk factors like

family history, past history, Ob/Gy history, drug history and examination including Measurement of blood pressure, height and weight. Thus collected data compiled in excel sheet and analyzed with help of EPI Info software and results are as below.

Results:

Table -1 Socio-demographic distribution of study participants

Age distribution	With PIH	Without PIH
<20	10(20%)	05(10%)
21-30	36(72%)	39(78%)
>30	04(08%)	06(12%)
$\chi^2 = 2.187, df = 2, \chi^2/df = 1.09, P(\chi^2 > .187) = 0.3351$		
Occupation		
Labour work	18(36%)	15(30%)
Housewife	25(50%)	28(56%)
Farmer	9(18%)	7(14%)
$\chi^2 = 0.654, df = 3, \chi^2/df = 0.22, P(\chi^2 > 0.654) = 0.8841$		
Education		
Primary	17(34%)	21(42%)
Secondary	18(36%)	10(20%)
Graduate	8(16%)	9(18%)
Illiterate	7(14%)	10(20%)
$\chi^2 = 3.295, df = 3, \chi^2/df = 1.10, P(\chi^2 > 3.295) = 0.3483$		
Modified Prasad's classification for socio-economical status		
1. >5797	21(42%)	23(46%)
2. 2898-5797	7(14%)	4(08%)
3. 1932-2577	18(36%)	16(32%)
4. 869-1546	4(8%)	7(14%)
5. below rs. 869	0	0
$\chi^2 = 1.845, df = 3, \chi^2/df = 0.61, P(\chi^2 > 1.845) = 0.6052$		

The table-1 shows the socio-demographic distribution of women with PIH and without PIH. The both groups were matched for their background information. The statistical association shows that they are similar in criteria. Majority of women in both groups were in 21 to 30 years which is most productive age group. Almost half of women in both groups were house wife. Less than 20% women were illiterate. The Chi square values are given in table.

Table-2 – Various risk factors and relation with PIH

Obstrectic history	With PIH	Without PIH
Primipara	15	10
Multipara	35	40
Odds – 1.7 95% CI – 0.68 to 4.30 p=0.2		
Past H/O of PIH and current PIH (only multigravida considered)		

P/H of PIH	13	4
No P/H of PIH	33	38
OR-3.7 95% CI- 1.1 to 12.5 p=0.03		
Family H/o DM		
Yes	15	11
No	35	39
OR-1.5 95% CI- 0.61 to 3.7 p=0.36		
Family H/O HT		
Yes	18	11
No	32	39
OR-1.9 95% CI- 0.8 to 4.8 p=0.12		
Relation with diet and PIH		
Vegetarians	35	15
Mixed type	15	28
OR-4.3 95% CI- 1.8 to 10.4 p=0.0009		
Menstrual cycle	With PIH	Without PIH
Regular	39	43
Irregular	11	7
OR- 0.5 95% CI- 0.2 to 1.6 p=0.3		

After matching socio-demographic criteria the various other risk factors information collected and association calculated as shown in table-2. It was found that there was no association with primipara and multipara with PIH (Odds – 1.7 95% CI – 0.68 to 4.30). Menstrual history had also no association with present PIH condition (OR- 0.5 95% CI- 0.2 to 1.6). Family history of hypertension (OR-1.9 95% CI- 0.8 to 4.8) and family history of diabetes mellitus (OR-1.5 95% CI- 0.61 to 3.7) also had not association with present PIH. Past history of PIH had strong association with current PIH for women who are multigravida (OR-3.7 95% CI- 1.1 to 12.5 p=0.03). Also there was interesting observation that vegetarian had higher chance of getting PIH then mixed diet pattern (OR-4.3 95% CI- 1.8 to 10.4 p=0.0009).

Discussion: The present study was conducted hospital based case-control study. There were 50 cases of PHI diagnosed women and 50 matched control without PIH women selected for study. The matching was made based on socio-demographic status. It was shown in table-1. The first risk factor which was commonly recorded even text book⁷, that is primipara. Even various studies reported similar observation that in first pregnancy, the PIH is most frequently occurring. Prakash J et al⁸ reported 57% were primigravida in their hospital based study. Bangal V et al⁹ also reported as high 65% of primigravida had PIH

in their study. But in present study there was no association was found with primipara and PIH. This may be due to small sample size of the study population.

The most important risk factor was found for PIH in present study, which was previous history of PIH among multigravida women. The Dutta's textbook of obstetrics⁷ and various studies^{5,10,11} also depicted similar observation. In present study showed the association of the previous history of PIH and current PIH and odds for this was 3.7 (CI- 1.1 to 12.1). Other factor which was found associated in present study was diet. Vegetarian diet women had higher odds of getting PIH compare to mixed type of diets. The odds for this 4.3 (CI is 1.8 to 10.4). Thus the protein intake has relation. Vegetarian diet population has smaller protein intake compare to mixed type of diet. Karu L et al¹² also found similar observation that vegetarianism was significant risk factors for pregnancy related complication including PIH.

Other risk factors like family history of hypertension, family history of diabetes mellitus and menstrual cycle history had no association with PIH in present study. But study form Qiu C et al¹³ and Tebeu PM¹⁰ reported the strong association with family history of DM and PIH in their studies. Family history of DM was also found as strong associated risk factor by K R et al¹¹ and Qiu C et al¹³. Abetew DF et al¹⁴ reported the association with longer menstrual cycle with PIH. In present study it was not associated.

The present study explored the various risk factors for pregnancy induced hypertension. While matching the basic sociodemographic factors could not able to identify as risk factors. This was the major limitation of study. To assess sociodemographic risk factors there is a need to plan community based cohort study. Also in present study some risk factors like age of menarche, obesity, personal characteristics, pedigree history of PIH were not studied as it was student research project and limitation of funds.

Conclusion: The various risk factors were studied among PIH women and non-PIH women as case control study. The risk factors which present study has identified, they were past history of PIH and vegetarian diet. Others risk factors like socio-demographic background, primipara, family history of hypertension, obesity, vascular abnormality and

placental abnormality need to explore in larger community based cohort study. The present study found vegetarian diet is risk factor for PIH. This is newly reported risk factor.

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