A Case Control Study on Socio-Demographic Profile and Risk Factors Associated with Pregnancy Induced Hypertension at a Tertiary Health Care Centre, Hyderabad

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Abstract:

Introduction: Pregnancy Induced Hypertension (PIH) is a significant public health threat. It increases the risk of cardiac failure, renal failure and cerebrovascular accidents. **Objectives :** To study the socio-demographic profile among the study population and to study the factors associated with pregnancy induced hypertension among the study population. **Method :** A Case control study was done among 100 pregnant women attending the tertiary centre. Cases and controls were selected in the ratio of 1:1 with 50 cases and 50 controls. The study participants were selected randomly and interviewed using a pretested questionnaire. Data was be entered in MS excel and analysis was done using Epi info 7.2.2.16. **Results:** Out of the total study participants 64% of the cases and 54% of the controls were Hindu by religion. Majority (72%) of the cases and 54% of the controls were multigravida. Majority (36%) of the cases belong to class II socio-economic status and majority of the controls (36%) belong to class III socio-economic status according to modified B.G Prasad classification. Majority(63%) of the subjects were multi-gravida and 71.2% have parity greater than two. Lower Socio-economic status, Physical Inactivity and History of PIH were found to be significant factors for Pregnancy induced hypertension among the cases. **Conclusion:** Lower socio-economic status, lack of exercise and past history of PIH were found to be significant among the study population. Anemia as a predictor of PIH needs further research as only few studies showed significant association between PIH and anemia. Although association between diet and PIH was present, it was not significant and needs further research.

Key words: Gestational age, Parity, Pregnancy induced hypertension, Risk factors

Introduction:

Hypertension in pregnancy is a common problem encountered in a developing country like India which contributes to major maternal and neonatal morbidity and mortality.[1] They remain among the most significant problems in obstetrics.

Hypertensive disorders in pregnancy includes preeclampsia, eclampsia, preeclampsia superimposed on chronic hypertension, and gestational hypertension. Gestational hypertension is also known as Pregnancy induced hypertension and 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] Although the etiology remains unclear it has a debilitating effect on the mother as well as fetus.

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Akhila K, Kumar P, Kench B. A Case Control Study on Socio-Demographic Profile and Risk Factors Associated with Pregnancy Induced Hypertension at a Tertiary Health Care Centre,Hyderabad. Healthline. 2021; 12(3): 14-19.
	DOI : 10.51957/Healthline_215_2021	

MMR in India is about 113 in 2018 according to the special bulletin on Maternal Mortality in India.[3] As per WHO, World Health Report (2005) says "Make Every Mother and Child Count'' and the major causes of maternal deaths were severe bleeding/ hemorrhage, infections, eclampsia, obstructed labor etc.[4] Hypertension complicates up to 7-10% pregnancies. Severe hypertension increases the mother's risk of co-morbidities. In addition, it causes growth restriction of the fetus, placental abruption, still birth. Regular Antenatal check-ups has greater role in minimizing the morbidity and mortality due to gestational hypertension.

In previous studies socioeconomic status, family history, parity, maternal age, twin-gestation, lifestyle, nutrition, severe anemia and various other factors have been attributed to PIH.[5,6,7] There is existing gap in the knowledge regarding the factors responsible for PIH in this study setting. Fewer studies were conducted in this area. The present study is done at Modern Government Maternity hospital where most of the deliveries occur in Hyderabad to focus upon the factors associated with pregnancy induced hypertension.

Method:

A Case Control study was done in Modern Government Maternity Hospital, where majority of the deliveries occur in Hyderabad. The target population includes pregnant women attending the health care centre during April-May 2019. Case was defined as pregnant woman diagnosed as hypertensive after 20 weeks(as per standard WHO definition) of pregnancy with systolic blood pressure >140mm of hg and diastolic pressure >90mm of hg without any signs of eclampsia. Control is defined as pregnant women who was not diagnosed with hypertension during pregnancy and selected from the same facility. Admission rate was less during the study period. Hence, 50 Cases were selected during the study period and 50 controls were taken.

Criteria for Physical activity include atleast 30 minutes of activities like walking, jogging etc. excluding routine activities. B.G Prasad classification of socio-economic classification was used to classify the study population as low, middle and high income groups. Bad Obstetric history includes abortion, abruptio placenta, pre-term, still-births, previous caesarian section, medical conditions including diabetes, thyroid etc. Dietary groups were classified as vegetarian and mixed groups, where subjects with exclusive vegetarian diet were considered under vegetarian group and remaining under mixed diet group.

Inclusion criteria for cases were all the pregnant women diagnosed as pregnancy induced hypertension and without any severe complications. For controls all the pregnant women without hypertension were included. Women having severe complications and who haven't given consent were excluded from the study.

Data collection:

Before data collection informed consent was taken from the respondents. A semi-structured questionnaire was administered and all the respondents were interviewed face to face by the researcher. Information was gathered regarding socio-demographic profile, parity, gestational age, age at marriage, diet, family history of hypertension, bad obstetric history, ANC visits and co-morbidities from 100 participants. Thus collected data was entered in MS Excel and analysed using Epi info v.7.2.6.6

Results:

Out of the total study participants 64% of the cases and 54% of the controls were Hindu by religion. Among the study population 42% of the cases and 60% of the controls belong to 21-25yrs age group. Among the cases 36% belong to class II socio-economic status and majority of the controls (36%) belong to class III socio-economic status according to modified B.G Prasad classification. (Table 1)

Majority(72%) of the cases and 54% of the controls were multigravida. Gestational age wasgreater than 36 weeksfor majority of cases

Table 1 : Socio demographic profile of study participants

Variables	Cases(n=50)	Controls(n=50)
	Frequency (%)	Percentage
Religion		
Hindu	32(64%)	27(54%)
Muslim	18(36%)	23(46%)
Maternal age(in yrs)		
<20	7(14%)	10(20%)
21-25	21(42%)	30(60%)
26-30	15(30%)	10(20%)
31-35	4(8%)	-
>35	3(6%)	-
Education		
Illiterate	14(28%)	6(12%)
Primary	3(6%)	5(10%)
Secondary	21(42%)	25(50%)
Intermediate	3(6%)	8(16%)
Graduate	9(18%)	6(12%)
Socio-economic classification		
Class I	5(10%)	3(6%)
Class II	18(36%)	9(18%)
Class III	11(22%)	18(36%)
Class IV	15(30%)	13(26%)
Class V	1(2%)	7(14%)

Table 2 : Frequency distribution of variables related to obstetric conditions

Variables	Cases(n=50)	Controls(n=50)
	Frequency (%)	Percentage
Parity		
Primigravida	14(28%)	23(46%)
Multigravida	36(72%)	27(54%)
Gestational Age		
20-36 wks	8(16%)	12(24%)
>36 wks	42(84%)	38(76%)
History of PIH		
Present	13(26%)	5(6%)
Absent	37(74%)	45(94%)
Bad Obstetric History (BOH)		
Present	13(26%)	9(18%)
Absent	37(74%)	41(82%)

Table 3 : Distribution of various risk factors of pregnancy induced hypertension among Study population

Variables	Cases(n=50)	Controls(n=50)
	Frequency (%)	Percentage
Family history of hypertension		
Present	15(30%)	10(20%)
Absent	35(70%)	40(80%)
Physical activity		
Present	19(38%)	32(64%)
Absent	31(62%)	18(36%)
Diet		
Vegetarian	21(42%)	24(48%)
Mixed	29(58%)	26(52%)
Anemia		
Present	17(34%)	11(22%)
Absent	33(66%)	39(78%)
Co-morbidities*		
Present	41(82%)	43(86%)
Absent	9(18%)	7(14%)

(84%) and controls (76%). History of Pregnancy induced hypertensionwas found to be more in cases compared to controls (OR 3.16, 95% C.I- 1.03-9.6, p=0.037). Among cases, 26% had bad obstetric history while only 18% of the controls had bad obstetric history. (Table2)

Of all the risk factors related to pregnancy induced hypertension, 30% of the cases had family history of hypertension and while only 20% of controls had it.Physical inactivity was found in 62% of cases while it was only 36% in controls. Anaemia was seen in 17% of the cases and 11% of the controls. There was no much difference related to co-morbidities in both the groups. (Table 3)

Of all the risk factors Lower Socio-economic status(O.R-2.92, 95% C.I 1.24-6.86,p=0.02), Physical inactivity (O.R2.9,95%, C.I- 1.28-6.53, p= 0.01)and History of PIH (O.R 3.16, 95% C.I- 1.03-9.6, p=0.037) were found to be significant among the cases. While Family History of hypertension (O.R 1.95,p=0.24), Parity(OR 0.96, p=0.98), Diet(OR 1.92,p=0.15), co-

Table 4: Predictors of Pregnancy Induced Hypertension among the cases

Risk Factors	Odds ratio (95% C.I)	p-value
Lower Socio-Economic Status	2.92 (1.24-6.86)	0.02
Parity	0.98(0.42-2.26)	0.96
Family History of Hypertension	1.95(0.76-5)	0.24
H/O PIH	3.5(1.15-10.6)	0.04
Bad Obstetrics History	2.38(0.87-6.55)	0.14
Physical Inactivity	2.66(1.18-5.98)	0.02
Anaemia	0.68(0.28-1.61)	0.38
Diet	1.92(0.86-4.28)	0.15
Co morbidities (Diabetes Mellitus, Thyroid disorders, Hypertension)	1.34(0.45-3.95)	0.78

morbidities(O.R 1.34, p=0.78) and anaemia (O.R 0.68,p=0.38)although had some association, it was not significant among cases. (Table 4)

Discussion :

The Socio-demographic profile in the present study includes maternal age, religion, education, Socio-economic status. Majority of cases (42%) as well as controls (60%) belong to 21-25 age group. In a study done by Agrawal etal,[6] 55.6% of the cases belong to 15-29 age group.

Regarding their education majority (46%) of cases and 50% controls had secondary education. In a study done by Bharti et al[13] majority of cases(82.8%) and controls (88.2%) were below graduates. In this study 36% of the cases belong to class II socio-economic status and 36% of controls belong to class III socio-economic status according to modified B.G Prasad classification. In the study done by Bharti et al[13] 84.3 % of cases and 85.3% of controls belong to low and middle income groups, which was consistent with present study.

Risk factors considered in this study include socio-economic status family history of hypertension, physical inactivity, diet, parity, Bad Obstetric History, anemia and Co-morbidities. Lower socio-economic status was found to be significant predictor for pregnancy induced hypertension with higher odds (O.R=2.92, p=0.02). A similar observation was seen in another study, where lower socio-economic status was significantly associated with higher blood pressure.[8] Majority (72%) of the cases and 54% of the controls were multigravida. This was similar to the study done by Mehta et.al[13] where about 68% were multi-gravida.

In this study, low physical activity was associated with higher odds of pregnancy induced hypertension and the association was significant (p=0.02). Our study was supported by studies done by Spracklen[9] in Iawo on Physical activity among pre-eclampsia women and another study by Gao on "Impact of Physical Activity During Pregnancy on Gestational Hypertension" found that low physical activity was associated with increased risk of preeclampsia.[10] In addition, some studies have found that regular physical activity during pregnancy increases the rate of placental bed blood flow and decreased risk of pre-eclampsia. Regular exercise during pregnancy enhances placental transfer of oxygen and further reduces the risk of hypertension.[11] In a study conducted by Vineeta Singh et. al lack of exercise was found to be significant predictor for PIH, which was similar to our present study.[12]

History of hypertension in previous pregnancy had significant association with PIH in our study(p=0.04). This was in agreement to a similar study, where history of hypertension in previous

pregnancy was found to be significantly associated with prevalence of hypertension in pregnancy (p=0.001).[13]

Although association between diet and pregnancy induced hypertension exists, it was not significant in our study(p=0.15). This finding was similar to a meta-analysis of cohort studies, where energy intake was higher for pre-eclampsia cases.[14]

In the current study, family history was not found to be significantly associated(p=0.24) withPregnancy Induced Hypertension (PIH). This finding was supported by a study done by Bharti et.al where family history had no significant association with PIH(p=0.455).[13]

An interesting observation was seen between parity and PIH in our study. Parity had no significant association with pregnancy induced hypertension where as per existing knowledge risk of PIH increases as the parity increases. This finding was in agreement with another study, where parity had no significant role in increasing the risk of pregnancy induced hypertension(p=0.163).[13]

In the present study, co-morbidities like diabetes and thyroid and bad obstetric history did not have significant association with pregnancy induced hypertension(O.R=1.34, p=0.78). This was in agreement to another study, in which no statistically significant relationship of hypertension in pregnancy was found with parity, history of abortions, family history.[13]

In the present study anemia had no significant association with PIH. In contrast, a study observed that the mean hemoglobin level of the case group (8.8206±2.53779) was significantly lower than that of the control group (9.7289±2.47033) (p<0.05)[15] and similar observation was found in another study with similar setting.[16]

Strengths and limitations:

This was a Case control study where evidence found will be more profound than cross-sectional studies. As a limitation, as this study was hospital based and limited to single visit of subjects, follow up of the subjects was not possible.

Conclusion: Well documented population level studies regarding PIH were very less in India. In the present study significant predictors of pregnancy induced hypertension were lower socio-economic status, physical inactivity and previous history of hypertension. This study gives added support to the existing literature and preventive strategies should be applied to every pregnant woman as predicting PIH is difficult. Although not significant, association was present between PIH and diet as well as BOH. Hence counselling regarding nutrition and at risk group like BOH needs early diagnosis and prompt treatment. Anemia as a predictor of PIH needs further research as only few studies showed significant association between PIH and anemia. Understanding the predictors of Pregnancy Induced Hypertension is very much essential in clinical practice which will facilitate the prioritization of interventions, implementing policies and allocate the resources accordingly.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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