Socio-demographic determinants for hypertension in pregnancy a case-control study in a tertiary care hospital of Visakhapatnam, Andhra pradesh

Ganga Bhavani Guduri [1], Devi Madhavi Bhimarasetty [2], Sunita Sreegiri [3], Teja Naveen.B [4]

Dept of Community Medicine, Andhra Medical College, Visakhapatnam.1- Assistant Professor, 2- Professor & HOD, 3- Associate Professor, 4- (MBBS)

How to cite this article:

Corresponding Author:
Dr. Ganga Bhavani Guduri, Assistant Professor Dept of Community Medicine, Andhra Medical College, Visakhapatnam, A.P.
Email: bhavani.amc@gmail.com

Abstract:
Research question: What are the various risk factors for hypertension in pregnancy and its effect on maternal and fetal outcome. The objectives were 1) To study the risk factors for hypertension in pregnancy, 2) To study the maternal and foetal out comes. *Methodology***:** A Case- Control study, was carried out in the Department of Obstetrics & Gynecology of a tertiary care hospital in Visakhapatnam city, A.P. Study subjects: One hundred and fifty antenatal women who have come for a safe institutional delivery were included as study subjects. Fifty women who fitted the definition for hypertension in pregnancy were selected as cases and 100 normotensive pregnant women were taken as controls. Informed consent was taken from the participants. Data on study variables was collected using a pretested, semi-structured questionnaires and was analyzed using Microsoft Excel. *Results:* About 46% of the pregnant women in cases & 60 % in controls were in the age group 21-25years. Mean age of pregnant women among cases was 20.6 ± 3.53 years. Majority (70% of the cases and 79% of the controls) were married between 15-20 years and more than 70% were housewives. About one fourth subjects in both the groups were illiterates. Body Mass Index (BMI) > 25 was observed in 22 % of the cases and 11 % of the controls. Factors such as overweight, being employed were significant risk factors. Intra Uterine Growth Retardation and preterm were found to be main fetal complications among cases as compared to controls. PIH leading to eclampsia is seen as common maternal complication. *Conclusion*: The study identified certain modifiable social determinants which have a role in primary prevention of pregnancy induced hypertension.

Key words: Hypertension, Pregnancy, Maternal and Fetal outcome

Introduction:

Hypertension in pregnancy complicates around 5-10% of all pregnancies. Around half million maternal deaths occur every year of which 10-15% are associated with hypertensive disorders of pregnancy [1]. Pregnancy induced hypertension ie., hypertension developing as a direct result of the gravid state can present as gestational hypertension

(without oedema or protienuria) or pre-eclampsia & eclampsia which are associated with edema and/or proteinuria [2].

Though the cause of pre-eclampsia is unknown, there does appear to be certain risk factors associated with the condition. The factors that have been postulated to influence the risk of pre-eclampsia among the mothers include diabetes, renal disease, obesity, multiple pregnancy, primi parity, age above 30 years, personal or family history of pre-eclampsia and chronic hypertension [3]. There are many studies in developed and some developing countries to assess the association between these factors and pre-eclampsia [4]. Those that have been conducted have often had an inadequate control and lack of statistical power, resulting in inconclusive evidence for determinants of pre-eclampsia. In this context a case – control study was carried out to elucidate the socio-demographic risk factors for hypertension in pregnancy and its effects on maternal and fetal outcomes.

Materials and Methods:

A Case- Control study, was carried out in the Department of Obstetrics and Gynecology of King George Hospital, a tertiary care hospital attached to Andhra Medical College, Visakhapatnam from June to August 2012. **Study subjects:** One hundred and fifty Antenatal women who have come for institutional delivery were included as study subjects. Pregnant woman with Blood pressure 140/90 mm of Hg or more on two occasions 6 hours apart in rest at a gestation of 20 weeks or more were taken as having hypertension in pregnancy and included as cases [5]. Fifty women who fitted the definition for hypertension in pregnancy were selected as cases and 100 normotensive women were taken as controls, as listed out in the parturition register. Those not willing to participate and with other medical conditions complicating pregnancy were excluded from the study. Study variables included age, education, family income, employment status, Body Mass Index (as per WHO classification), past history of hypertension, pregnancy outcome in terms of maternal outcome and fetal outcome. Pregnant women with family annual income below 60,000 were considered as being below poverty line (BPL). Maternal outcome was considered as "Good" if no complications associated with hypertension were reported during hospital stay in the intranatal/ postnatal period. Maternal outcome was considered as "Poor" if complications such as death, sepsis/ shock,

postpartum hemorrhage or preterm labor were reported during the hospital stay. Fetal outcome was considered as "Good" when the newborn had normal birth weight and Apgar score 8-10. It was considered as "poor" for babies born with intra uterine growth retardation (IUGR), stillbirth, preterm birth. Data was collected using a pre- tested, semi-structured questionnaire and triangulated with information from hospital records. Data was analyzed using Microsoft Excel Data sheet and expressed in the form of tables and figures and p value of < 0.05 was considered to be of statistical significance. Odds Ratio and Confidence intervals were calculated for assessing strength of association. **Ethical consideration**: Informed consent from all the subjects. Institutional ethics committee approval was taken.

Though the study design is a case control study with the primary objective of identifying risk factors additional information on maternal and foetal outcomes were gathered and analyzed.

Results:

The study sample included 50 pregnant women with hypertension as cases and 100 pregnant women who were normotensive as controls.

About 46% of the pregnant women among cases and 60% among controls were in the age group 21-25years. Mean age of pregnant women among cases was 22.4 $\pm$ 3.53 and among controls was 22.3 $\pm$ 3.04 years. However this difference was not of statistical significance, (S.E= p >0.05) In the present study all the cases and 96% among controls were in the age group of < 30 years.

Regarding age at marriage, 70% of the cases and 79% of the controls were married between 15-20 years. Mean age at marriage was 18.51 years among cases and 18.75 years among controls. Mean age at first pregnancy was 20.84 years among cases and 19.77 years among controls. Moreover the difference was not statistically significant. Around half of the pregnant mothers both in cases and controls were in the 2nd order pregnancy. Majority of the pregnant mothers belong to Hindu religion (85 % among controls and 88% among cases).

More than 75% of the study population belong to below poverty line families. About half of the pregnant mothers both in control group (51%) and cases (52%) were from joint families.

Majority of the study population both cases and controls 66% and 74 % respectively were in the normal range of BMI. In 22% of cases and 11% of

controls BMI was observed to be > 25. BMI < 18.5 was observed in 8 % of cases and 15 % of controls.

Table 1: Distribution of cases and controls as per literacy and occupation status

EDUCATION	No.of Cases n =50(%)	No. of controls n =100(%)
Illiterate	13(26%)	27(27%)
Primary	10(20%)	17(17%)
Secondary	18(36%)	42(42%)
Intermediate	5(10%)	8(8%)
Graduation	4(8%)	6(6%)
Total	50	100
OCCUPATION		
Semi-professional	2(4%)	NIL (0%)
Clerical, shop owner, farm owner	11(22%)	12(12%)
Skilled work or semi skilled	2(4%)	2(2%)
Unemployed /housewives	35(70%)	86(86%)
TOTAL	50	100

Among the study population 42% of controls and 36% of cases were educated up to secondary level (Table1). About one fourth were illiterates (27% & 26% among cases and controls respectively). Most of the study subjects in both cases and controls were unemployed or housewives.

Table 2: Socio - Demographic risk factors in cases and controls

| Variable	Cases(n= 50)	Controls(n= 100)	OR	95% CI	P value
Literacy					
Illiterate	13(26%)	27(27%)	0.9	0.519-2.3	>0.05
Educated	37(74%)	73(73%)			
Family					
Nuclear	23(46%)	48(48%)	0.9	0.56-2.17	>0.05
Others	27(54%)	52(52%)			
Occupation					
Employed	15(30%)	14(14%)	2.63	1.85-3.74	<0.05
Unemployed	35(70%)	86(86%)			
Economic status					
BPL	39(68%)	74(74%)	1.24	2.13-3.38	<0.05
APL	11(22%)	26(26%)			
BMI					
≥25	11(22%)	9(9%)	2.85	3.06-24.53	<0.05
<25	39(78%)	91(91%)			

*P <0.05 = significant, >0.05 = not significant

Table 3: Presentation of hypertension among the cases

| Presentation	No of cases (n=50)
PIH/ gestational hypertension	23 (46%)
Pre-eclampsia	8 (16%)
Eclampsia	18 (36%)
Chronic HTN	1 (2%)

Of the fifty cases, 8 had pre-eclampsia and 18 had eclampsia. Chronic hypertension was seen in one case.

Figure 1: Comparison of foetal outcome in cases and controls
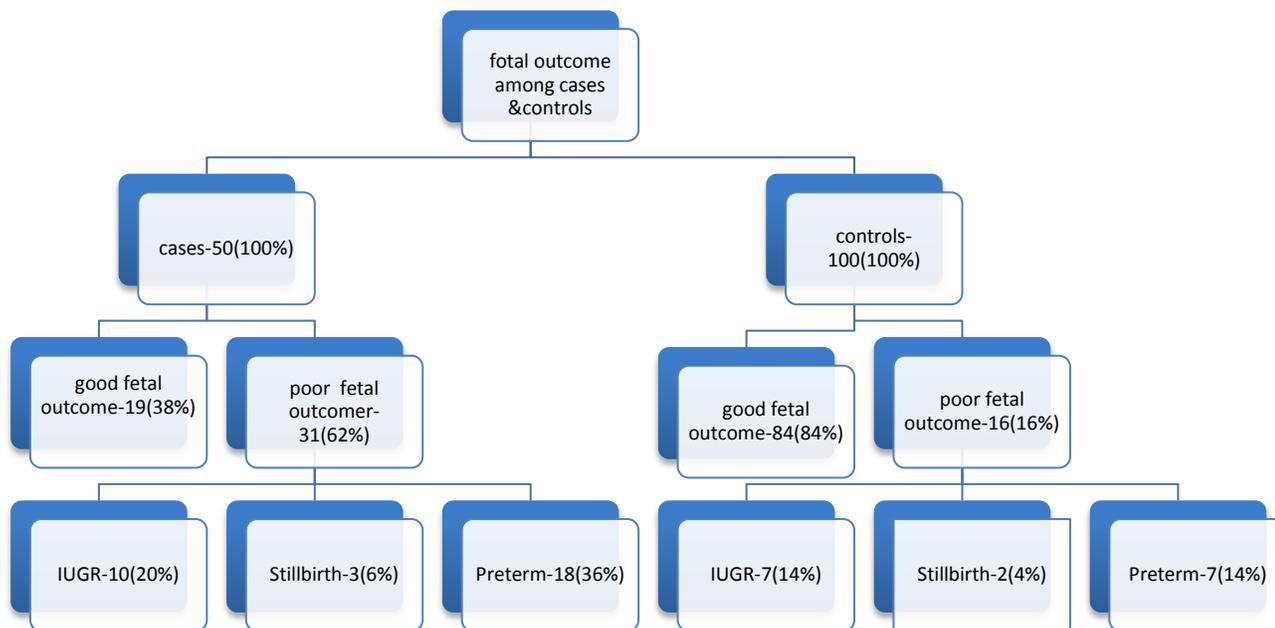
Among cases, fetal outcome was poor in 62% compared to 16% in controls. The risk of poor fetal outcome was found to be high in cases (OR-8.56,CI-18.35- 4.01, P=<0.05) Among cases, 6% of fetal outcome was stillbirth compared to 2% in controls. IUGR was found to be 20% among cases and 7% among controls. Similarly prematurity/preterm was 36% among cases compared to 7% among controls.

Figure 2: Distribution of Maternal complications among Cases and Controls
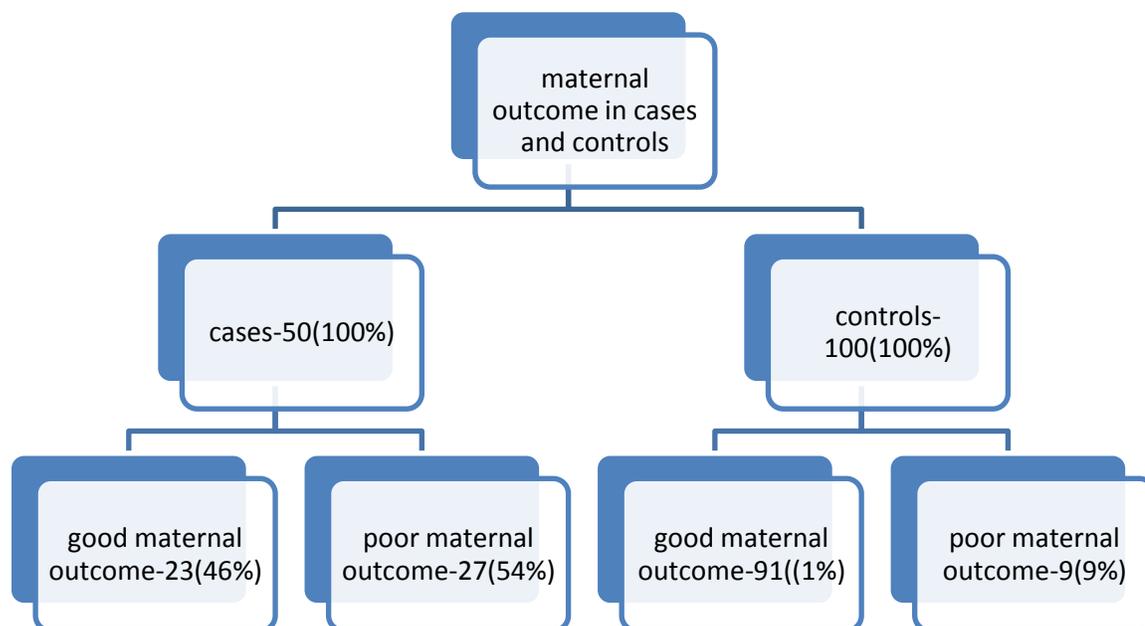
Maternal complications were reported in 54% of cases compared to 9% among controls. The risk of poor maternal complications was found to be high among cases (OR-11.86, CI-27.23-5, P= > 0.05) Postpartum hemorrhage was observed in 18% of cases as compared to 2% in controls and preterm labour was noted in 36% of cases and 7% in controls. No maternal deaths were reported in either groups during the hospital stay.

Table 4: Risk of Fetal and Maternal complications among Cases and Controls

Variable	Cases	Controls	OR	95% CI	P value
IUGR	10/50	7/100	2.86	1.04-7.85	<0.05
Prematurity	18/50	7/100	7.47	2.9-19.10	<0.05
Stillbirth	3/50	2/100	3.12	0.506-18.9	>0.05
PPH	9/50	2/100	10.75	2.22-51.4	<0.05
Preterm labour	18/50	7/100	7.47	2.9-19.10	<0.05

P <0.05 = significant, >0.05 = not significant

The risk of having Intrauterine Growth Retardation , Prematurity and Still birth as fetal complications was high among cases as compared to controls (OR=2.86,7.47 & 3.15 respectively). Maternal complications such as PPH and Preterm labour were the other complications associated with PIH in addition to pre-eclampsia and eclampsia. The Odds Ratio was 10.75 for developing PPH among cases as compared to controls.

Discussion:

About half of the pregnant women in cases and one third in controls were in the age group of 21-25 years similar to study by Kumar S Ganesh et al [3]. However about one-fourth of the cases ie study population with hypertension were below 20 years of age with mean age of 22.4 years. Majority (about 70%) both in cases and controls were married between 15-20 years with mean age at marriage 18.51 among cases and 18.75 years among controls and were of 2nd order pregnancy, which shows that the trend of early marriage and immediate conception before attaining 20 yrs of age is still continuing in our community.

In this study there was a mix of population, both in cases and controls, with regard to education levels. One third of them were illiterates. Of those who had opportunity to attend school, one fourth limited up to primary level education. Only one third could continue up to secondary level. Study conducted by Shahid A. Mujawar et al [6] reported that majority were literates although the maximum level was up to primary school. Illiteracy as a risk factor was not found to be strongly associated with occurrence of hypertension in pregnancy(OR<1).

Most of the study subjects were unemployed. This is comparable to other studies by Shahid A. Mujawar et al [6]. This may lead to lack of awareness and low status of women in the family affecting her nutritional as well as overall health status indirectly. However being employed appears to be a risk factor for hypertension in pregnancy (OR-2.6). More than individual earnings, the   family income is considered more important as it is one of the significant social-economic factor contributing to poor maternal and feotal outcomes. This study shows women from BPL families are more at risk for developing hypertension (OR=1.2) comparable to report by Shahid A. Mujawar et al [6].

In this study, 22% of cases and 11% of controls had BMI ≥25.Statistical test shows that pregnant women who had BMI≥25 were 2.85 times more likely to develop hypertension than women who had normal BMI. Study conducted by Kumar S Ganesh et al [3] also demonstrated that in pregnancy BMI ≥ 25 (OR-11.27) is a significant independent determinant of pre-eclampsia. He also observed that past history of hypertension as a risk factor was found to be strongly associated with occurrence of hypertension in present pregnancy (OR=9.1). Maryam kashanian et al found that preeclampsia in a previous pregnancy, family history of hypertension and high BMI as risk factors [7].

IUGR, preterm and still birth were found to be main fetal complications among casesas compared to controls and the difference is found to be significant (OR=2.86,7.47 & 3.15 respectively). Similar results were observed by Vidyadhar B Bangal et al [8], stating preterm labour as the commonest maternal obstetric complication.

Maternal complications such as PPH and Preterm labour were the other complications associated with PIH in addition to pre-eclampsia and eclampsia. The Odds Ratio was 10.75 for developing PPH among cases as compared to controls .

The millennium development goal 4 addresses maternal health. One of the leading causes of maternal morbidity and mortality is PIH. Interventions to reduce this condition through

antenatal screening has helped to identify the cases early. However, more steps need to be taken to reduce the negative foetal outcomes especially prematurity.

Conclusion:

The study identified certain modifiable social factors which have a role in primary prevention of pregnancy induced hypertension. Creating awareness among antenatal mothers about pregnancy induced hypertension and its complications and reinforcing to the health care providers the importance of screening and early detection of PIH and timely interventions will be helpful in reducing this problem.

References

1. Navneet Magon, Sanjiv Chopra and G.S.Joneja. Hypertension in pregnancy: The endocrine and metabolic aspect. Indian J Endocrinal metab.2011 Oct; 15 suppl 4:s380-2.

2. D.C. Dutta, Text book of Obstretics, July 1991.

3.Kumar Ganesh et al. Determinants of Pre-eclampsia; A case-control study in a District Hospital at Puducherry ,South India. Indian j community Med.2010 Oct-Dec; 35(4): 502-505.

4. Lee CJ, HsiehTT ,Chui TH, ChenKC, LoIM,Hung. Risk factors for pre-eclampsia in an Asian population. International Journal of Gynaec & Obstet.2000;70: 327-33[PubMed].

5. Piyush Guptha & O.P.Ghoi, Text book of Preventive & Social Medicine

6.Shahid A. Mujawar and Vinayak W. Patil. Socio-Economic Characteristics and pregnancy induced hypertension in the women of western region of India. Internal.J.Med.Sci.,3(1&2).24-26.

7. Maryam Kashanian MD. Hamid Reza Baradaran MD, Shohreh Bahasadri MD, Razieh Alimohammadi MD. Risk factors for Pre-Eclampsia, A study in Tehran, Iran. Archieves of Iranian Medicine.Vol.14.No.6.Nov 2001.413.

8. Vidyadhar B Bangal et al. Maternal and Foetal Outcome in Pregnancy Induced Hypertension: A Study from Rural Tertiary Care Teaching Hospital In India. International J of Biomed. Research.2011.No 12(2011).