



“STUDY OF RISK FACTORS FOR HYPERTENSIVE DISORDERS OF PREGNANCY IN A TERTIARY CARE MATERNITY HOSPITAL OF DELHI”.

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ABSTRACT

Objective: To study risk factors for hypertensive disorders of pregnancy in a tertiary care maternity hospital of Delhi. A variety of familial, genetic and socioeconomic factors have been known to predispose to hypertensive disorders of pregnancy. This study was conducted to study the quantum of risk of these factors which would help in taking timely preventive and curative measures.

Method: A “prospective case – control observational study” was conducted in the department of Obstetrics and Gynaecology, Kasturba Hospital, New Delhi. 100 pregnant women presenting with hypertension from January 2014 to December 2014 were taken as cases. 100 pregnant women with age and parity matched were taken as controls and compared in terms of risk factors.

Results: Family history of hypertension, history of hypertension in previous pregnancy, illiteracy, low socioeconomic status were the major risk factors identified. In our study, 21% of the cases were having history of hypertension in the family as opposed to 4% in controls. 56.4% of cases had a history of hypertension in previous pregnancy as compared to only 5.1% of controls. Women with history of hypertension in previous pregnancy were 25.39 times at higher risk. Significantly more cases (27%) versus controls (9%) were illiterate. Majority of the cases (63%) belonged to lower and upper lower socioeconomic status. 45% of cases were unbooked as compared to 21% of controls.

Conclusion: The single most significant risk factor is having hypertension in a previous pregnancy.

KEYWORDS : Risk factors, illiteracy, low socioeconomic status, unbooked status, hypertension in previous pregnancy, hypertension in family.

INTRODUCTION

Hypertensive disorders of pregnancy is one of the maternal multifactorial disease that still puzzles obstetricians all over the world and seriously endangers the safety of the mother and fetus during pregnancy. It is the 2nd most common medical disorder during pregnancy affecting 5-10% of all pregnancies¹.

Preeclampsia is more common in women who are primigravida or who have preexisting hypertension, diabetes, autoimmune diseases such as lupus, various inherited thrombophilias, renal disease, women with a family history of preeclampsia, obese women, and women with multiple gestation (twins or multiple birth)¹². The single most significant risk for developing preeclampsia is having preeclampsia in a previous pregnancy.

In India, a large no. of young primigravida are poor, illiterate, lack health awareness and get poor ante-natal care. The failure to identify and act on known risk factors at booking contributes to increased morbidity and deaths due to hypertensive disorders of pregnancy.

MATERIALS AND METHODS

We conducted a hospital based prospective case control study at Kasturba hospital from January 2014 to December 2014.

100 pregnant women with singleton pregnancy with cephalic presentation with hypertension attending the antenatal outpatient department in Kasturba Hospital were taken as cases. Hypertension during pregnancy is defined as a sustained systolic blood pressure of 140mm Hg or more and/or a diastolic blood pressure of 90mmHg or more on 2 occasions at least 6 hours apart but within 7 days¹. Exclusion criteria included pregnancies complicated with diabetes mellitus, severe anaemia, heart disease, primary renal disease, collagen vascular diseases, epilepsy, patients with any presentation other than cephalic, with multiple pregnancy, Rh-negative mothers, estimated birth weight <500 grams, major fetal anomaly.

Normal pregnancies without hypertension matched with cases at the time of admission in respect of age, parity, gestational age were taken as controls.

Cases and controls were evaluated and compared in terms of various risk factors like socioeconomic status, educational status, antenatal attendance, history of hypertension in family and history of hypertension in previous pregnancy.

Collected data was coded into variables, entered into statistical software and analyzed using SPSS version 16. Tests of significance like chi-square and Fisher’s exact test were used when suitable. Multiple logistic regression was used to calculate adjusted odd’s ratio.

RESULTS

A prospective case control study was carried out at Kasturba hospital to assess risk factors for hypertensive disorders of pregnancy. 100 pregnant women with hypertensive disorders of pregnancy were studied and compared with 100 pregnant women as controls without hypertensive disorder of pregnancy (age, parity and gestational age matched). The observations and results were analyzed using SPSS version 16. The differences were considered to be significant if the p-values were less than 0.05.

Table 1: Distribution of study subjects according to educational status.

Education	Cases No. (%)	Controls No. (%)	Adjusted Odds Ratio (95% Confidence interval)	P value
Illiterate	27 (27)	09 (09)	2.01 (1.25-16.28)	.005
Primary	20 (20)	24 (24)	.30 (0.06 - 1.49)	.140
Middle	25 (25)	33 (33)	.30 (0.07 -1.18)	.085
Secondary & above	28 (28)	34 (34)	1 (Ref)	
Total	100 (100)	100 (100)		

($\chi^2 = 11.048, p = .011$)

Among cases, as many as 27% of women were illiterate. 28% of women were educated till secondary class and above followed by 25% till middle class and 20% till primary class. In the control group, maximum subjects (34%) were secondary class pass followed by middle class (33%) primary pass (24%) and illiterate (9%). Significantly more cases (27%) versus controls (9%) were illiterate ($p = .011$). Illiterate women were 2.01 times more likely to develop hypertensive disease of pregnancy as compared to women who were educated upto secondary class and above.

Table 2: Distribution of study subjects according to the Socio-economic status.

Socio-economic status	Cases No. (%)	Controls No. (%)	Adjusted Odds Ratio (95% Confidence interval)	P value

Upper & Upper middle	14 (14)	21 (21)	1 (Ref.)	
Lower middle	23 (23)	40 (40)	1.81 (.54 -6.08)	.334
Lower & Upper lower	63 (63)	39 (39)	11.8(1.98-70.43)	.007
Total	100 (100)	100 (100)		

($\chi^2 = 11.63, p=.003$)

According to modified Kuppuswamy scale, majority of cases (63%) belonged to lower and upper lower socioeconomic status while most of the controls (40%) belonged to lower middle socioeconomic status. 14% of cases and 21% of controls belonged to upper & upper middle socio-economic status. Women belonging to lower and upper lower socio-economic status had 11.8 times higher risk of developing hypertensive disease of pregnancy as compared to women belonging to upper and upper middle socio-economic status.

Table 3: Distribution of study subjects according to antenatal attendance

Antenatal attendance	Cases No. (%)	Controls No. (%)	Adjusted Odds Ratio (95% Confidence interval)	P value
Booked	55 (55)	79 (79)	1 (Ref.)	
Unbooked	45 (45)	21 (21)	3.02 (1.55-5.92)	.001
Total	100 (100)	100 (100)		

($\chi^2 = 13.026, p=.000$)

45% of women with hypertension were unbooked as compared to 21% of controls. The difference was found to be statistically significant ($\chi^2 = 13.026, p=.000$). The odds of developing hypertensive disease of pregnancy were 3.02 times higher in unbooked women as compared to booked ones.

Table 4: History of hypertension in previous pregnancy among study subjects.

History of hypertension in previous pregnancy	Cases No. (%)	Controls No. (%)	Adjusted Odds Ratio (95% Confidence interval)	P value
Present	22 (56.4)	02 (5.1)	25.39 (3.01-34.33)	.003
Absent	17 (43.6)	37 (94.9)	1 (Ref.)	
Total	39 (100)	39 (100)		

($\chi^2 = 24.074, p=.000$)

It was found that 56.4% of cases had a history of hypertension in previous pregnancy as compared to only 5.1% of controls ($p=.000$). Women with a history of hypertension in previous pregnancy were 25.39 times at higher risk of developing hypertensive disorder of pregnancy in comparison to those with no history.

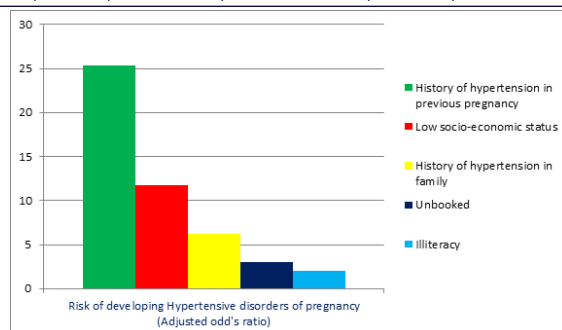
Table 5: History of hypertension in family among study subjects.

History of hypertension in family	Cases(n=100) No. (%)	Controls(n=100) No. (%)	Adjusted Odds Ratio (95% Confidence interval)	P value
Present	21 (21)	04 (04)	6.25 (1.71-22.80)	.006
Absent	79 (79)	96 (96)	1 (Ref.)	
Total	100 (100)	100 (100)		

($\chi^2 = 13.211, p=.000$)

In our study, 21% of the cases were having history of hypertension in the family as opposed to only 4% of controls and a statistically significant difference was observed ($p=.000$). It can be said that women with a history of hypertension in the family were 6.25 times more likely to develop hypertensive disorder in the present pregnancy in comparison to those without history of hypertension in the family.

Fig. 1: Comparison of various risk factors of hypertensive disorders of pregnancy



Risk of developing hypertensive disorders of pregnancy according to adjusted odd's ratio was greatest in cases having history of hypertension in previous pregnancy (25.39) followed by those belonging to low socio-economic status (11.8), history of hypertension in family (6.25), unbooked status (3.02) and illiteracy (2.01).

DISCUSSION

In our study it was found that, the proportion of cases (27%) who were illiterate was greater as compared to controls (9%) ($p=.011$). Also illiterate women were 2.01 times more likely to develop hypertensive disease of pregnancy as compared to women who were educated upto secondary class & above. Similar results were found by Tebeu P M et al¹ (2005-2007) who concluded that the risk of having hypertension in pregnancy was greater for illiterate women (OR: 1.6 95% CI: 1.5-3.6). Also Abalos E et al¹ in a secondary analysis of World Health Organization Multicountry Survey on Maternal and Newborn Health (WHOMCS) database (2010-2012), deduced that lack of formal education was more frequent in the group of eclamptic women. However, Illiteracy is related to early marriage, limited health awareness and poor access to antenatal care and family planning hence predisposing to hypertensive disorders of pregnancy.

In our study most of the cases (63%) belonged to lower and upper lower socioeconomic status according to Kuppuswamy scale. Women belonging to lower and upper lower socio-economic status had 11.8 times higher chance of developing hypertensive disease of pregnancy as compared to women belonging to upper and upper middle socio-economic status. Sachan R et al⁶ (2011-2012) in a study done in Lucknow also concluded that the majority of eclamptic patients were of low socio-economic status. Similarly, Schneider et al⁷ (2006) in their secondary analysis of "German perinatal quality registry" observed that women with low-income jobs were diagnosed with pre-eclampsia more frequently than pregnant women with high income groups. Low socio-economic status is an important risk factor for pre-eclampsia due to illiteracy, early marriage, nutritional deficiencies, unhygienic living conditions and reduced ante-natal care associated with it.

Statistically significant proportion of cases were unbooked (45%) as compared to controls (21%) ($p=.000$).The odds of developing hypertensive disorders of pregnancy were 3.02 times higher in unbooked women as compared to booked ones. This has been corroborated by several authors, such as a hospital based study done by Wadhvani R et al⁸ (2013) in Bhopal in which 68% of women were unbooked and also Gawdw A et al⁹ (2012) who found that 74% of hypertensive cases were unbooked. Early registration and antenatal booking will enable identification of pregnant women at risk for developing hypertensive disorders of pregnancy and starting preventive measures like dietary and calcium supplementation.

History of hypertension in previous pregnancy was present in 48.72% of cases as compared to only 5.13% of controls ($p=.000$), the difference being statistically significant. Women with a history of hypertension in previous pregnancy were 25.39 times at higher risk of developing hypertensive disorder in the present pregnancy in comparison to those with no history. These results were similar to the study done by Ganesh K S et al¹⁰ (2006) in Karnataka who found the risk to be 9.63 times higher (OR=9.63, 95% CI=1.15-80.63) and Ramesh K et al¹¹ (2013) in their hospital based study done in Karnataka who found the risk to be 58.5 times higher (OR=58.50, 95% CI=22.0-154.8, $p=.0001$). Women with hypertensive disorder of pregnancy have an underlying risk factor pre-disposing them to preeclampsia in future pregnancy. A systematic evaluation for underlying risk factors therefore may identify a specific

pathway suitable for a specific intervention.

As many as 21% of the cases were having a history of hypertension in the family. Only 4% of the controls had a family history of hypertension ($p=.000$), difference being statistically significant. Women with history of hypertension in the family were 6.25 times more likely to develop hypertensive disorder in the present pregnancy in comparison to those without history of hypertension in the family. Comparable results were shown by Ganesh K S et al¹⁰ (OR=5.48, 95% CI=1.09-27.55, $p=.04$) and Ramesh K et al¹¹ (OR=16.71, 95% CI=9.0-31.0, $p=.0001$) in their studies. Being a multifactorial, polygenic disorder, hypertensive disorder of pregnancy has a hereditary predisposition as an important risk factor¹.

CONCLUSION

It was concluded from the present study that various risk factors which predispose a woman to develop hypertension during pregnancy can be ascertained at the first antenatal visit. The important risk factors that were identified were illiteracy, low socio-economic status, nulliparity, unbooked status, a history of hypertension in previous pregnancy, a family history of hypertension, chronic hypertension of more than ten years and raised B.P at booking. These identified risk factors can be used to assess the risk at booking so that a suitable surveillance routine to detect hypertension can be planned for the rest of the pregnancy.

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