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Determinants of Preeclampsia at a Tertiary Care Hospital

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Abstract:
Background: *Pre-eclampsia is a pregnancy specific vasculo-endothelial disorder affecting multiple systems and one of the leading causes of maternal and infant morbidity and mortality globally. The etiology is still unclear.Unlike deaths due to other direct causes, pre-eclampsia related deaths appear to be increasing and linked to multiple factors, making prevention of the disease a continuous challenge. The aim of this study is to assess determinants of pre-eclampsia among women attending delivery services in Umaid hospital, Dr. S.N. Medical college, Jodhpur, Rajasthan.*
Objective*: To determine the risk of preeclampsia in pregnancy with factors that may be present preconceptionally and at antenatal booking.*
Design: *A hospital based matched case control study*
Results*: Study subjects included 200 cases and 200 controls. Advanced maternal age (>30 yrs) (OR=1.667), BMI ≥ 25 (OR=8.048), multiple gestation (OR=2.042), (h/o preeclampsia in previous pregnancy (OR=6.659), h/o chronic hypertension (OR=6.622), family h/o hypertension (OR=8,469), h/o Diabetes(OR=8.955) are found to be significant risk factors of preeclampsia. Caesarean section was the mode of delivery in 60% cases (p-0.021)*
Conclusion*: These factors and the underlying evidence base can be used to assess risk at booking so that a suitable surveillance routine to detect preeclampsia can be planned for rest of the pregnancy.The pregnant women at risk of pre-eclampsia should be identified early and high-quality antenatal care should be provided in order to minimize the complications of pre-eclampsia both for the mother and the fetus.*
Keywords: *Preeclampsia*

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I. Introduction

Preeclampsia and the other hypertensive disorders of pregnancy remain leading causes of maternal and perinatal morbidity and mortality, complicating 5 to 10 percent of all pregnancies and together they form one member of the deadly triad, along with haemorrhage and infection. Of these disorders, preeclampsia syndrome is the most dangerous, affecting 3.9 percent of all pregnancies globally.[1] Although pre-eclampsia is not a totally preventable condition, its early detection and proper treatment can prevent severity. Unclear etiology and the unpredictable nature of the disease further worsen the situation. .[2,3]

The WHO reviews of maternal mortality worldwide suggest 16 percent maternal deaths in developed countries due to hypertensive disorders.[4]Importantly, more than half of these hypertension-related deaths are preventable.[5] India accounted for 19% of maternal deaths worldwide.[6] Five percent of maternal deaths in India are due to hypertensive disorders.[7]

It is a unique disease in several ways: it is one of only a small number of pathologic conditions that are specific to pregnancy. It is by definition, a disorder of widespread vascular endothelial malfunction and vasospasm that occurs after 20 weeks' gestation and can present as late as 4-6 weeks postpartum. It is clinically defined by hypertension and proteinuria, with or without pathologic edema. It can affect virtually every organ system including thrombocytopenia, renal insufficiency, liver dysfunction, pulmonary edema, visual disturbances, cerebrovascular and cardiovascular complications, placental abruption, acute renal failure, disseminated intravascular coagulation, multiple organ system failures, postpartum haemorrhage and maternal death. Prematurity, intrauterine growth restriction, fetal distress, neonatal asphyxia, low birth weight, stillbirth and perinatal death are fetal and neonatal complications to be anticipated and dealt with.

Various sociodemographic, obstetric and medical factors have been postulated to influence the risk of preeclampsia. Knowledge and identification of these risk factors will help in estimating each woman's individualized risk and allow antenatal surveillance to be directed at these women and guide the healthcare providers for counselling of such women and possibly reduce the recurrence risk of preeclampsia if some modifiable risk factors are present. The causes and risk factors for pre-eclampsia remain unclear, however and

thus pre-eclampsia has been called a "Disease of theories" [8]. The factors that have been postulated to influence the risk of pre-eclampsia among the mothers include diabetes, obesity, multiple pregnancy, primiparity, personal or family history of pre-eclampsia, and chronic hypertension. In developing countries, evidence on the association between these factors and pre-eclampsia is scarce [9-11]. So, the study of risk factors of pre-eclampsia can be used to assess risk of pre-eclampsia at ante natal booking [12]. As there is paucity of data on risk factors of pre-eclampsia in Rajasthan, India, this study was conducted.

II. Materials and Methods

This matched case control study was conducted between January 2017 to June 2017 in the Department of Obstetrics and Gynaecology, Dr. S.N. Medical College and associated group of hospitals, Rajasthan, India.

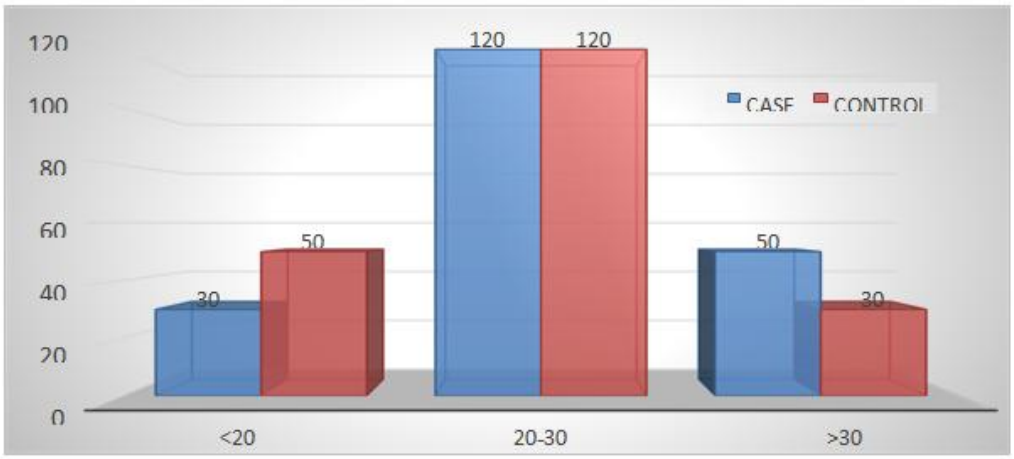
All pregnant women who fulfilled the inclusion criteria & delivered in labor ward of Umaid hospital Jodhpur, diagnosed with preeclampsia were taken as the cases and the next subsequently delivering matched woman was taken as control. The cases were identified from hospital based **ACOG** diagnostic criteria(2017) of preeclampsia: women with blood pressure ≥ 140 mm Hg systolic or ≥ 90 mm Hg diastolic on two separate readings taken at least four hours apart with previously normal blood pressure and when proteinuria is greater than or equal to 300mg per 24-hour urine collection or dipstick reading of atleast 1+ after 20 weeks gestation. In the absence of proteinuria, new onset hypertension with any of the complications like Thrombocytopenia ,renal Insufficiency impaired liver function ,pulmonary edema ,cerebral or visual symptoms. The diagnosis involved detailed history taking, physical examination and laboratory tests. The women's charts were reviewed, and women were included as cases if they fulfilled the aforesaid diagnostic criteria. Controls were the next subsequent women who were attending delivery care from hospital and were not diagnosed as preeclampsia .The study subjects were explained about the purpose of the study. A written informed consent was taken before administering a detailed pre-tested, pre- structured questionnaire to obtain information on socio-demographic profile and clinicoepidemiological factors. Data were collected and entered in MS Excel worksheets and results expressed in percentage. Chi- square test was applied to know the significance between two variables and the significance level considered is 0.05%. Data was analyzed using SPSS version 19.

III. Results

The study subjects included 200 preeclamptic cases and 200 controls.There was no significant difference in number of cases and controls on the basis of religion. In both the groups >80% were Hindu female and < 20% women were Muslims. Hence religion shows no association with the disease. (Chi-square = 0.018 with 1 degree of freedom; P=0.89NS). Number of women were significantly more (60% in both the groups) in 20 - 30 years age group with odd ratio 2.778, (95% CI - 1.465 to 5.269) and p = 0.003S. This is because of the fact that it is the most common age group for childbearing. Amongst the rest 40% women, it was observed that cases were less (15%) in <20year age group and more (25%) in >30 years age group as compared to controls suggesting advanced maternal age to be the vulnerable age group for preeclampsia with OR 1.667, (95% CI – 0.992 to 2.799), p-0.07 NS. 83% cases belonged to rural areas. Almost similar results were found in the control group. Since no significant difference was observed, hence this variable could not be significantly associated with the disease in study. [OR- 1.042, (95% CI- 0.699 to 1.554), p- 0.92 NS]. 80% cases were in normal (18.5-24.9) BMI group followed by 13% in overweight and obese (≥25 BMI) group and 7 % in underweight (<18.5 BMI) group. In ≥25 BMI group, cases were more (13%) in comparison to controls (3%) and results were statistically significant. [OR- 8.048, (95% CI- 2.670- 24.178), p<0.0015 S]. 17% cases and 3% of normotensive mothers had history of chronic hypertension. Thus showing an important association with the disease. Results were statistically significant [OR- 6.622, (95% CI- 2.713-16.164), P- 0.001S].12% cases while only 3% of normotensive mothers had history of diabetes.Results were statistically significant with odd ratio 8.955, 95%CI- 2.651-30.250 & (p<0.005) .12% cases where as only 3% of normotensive females had renal dysfunction. Results were statistically significant with odd ratio 8.955, 95%CI- 2.651-30.250, (p=0.001S) .14% cases and only 2% of normotensive females had family history of hypertension, providing a strong association of preeclampsia with chronic hypertension. Results were statistically significant with odd ratio 8.469, 95% CI- 2.910-24.645, (p=0.001S) .Out of 124 multigravidas in our study, 21% cases and only 5% of normotensive females had history of PE in previous pregnancy, proving it to be strongly associated with the disease. Results were statistically significant with odd ratio -6.659, (p=0.001S). Chi-square=28.034 with 1 degree of freedom .

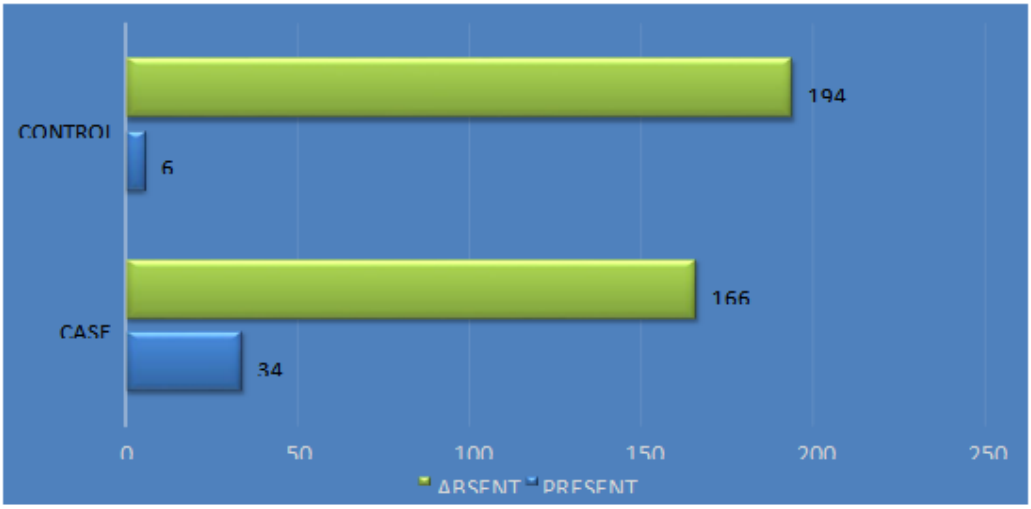
GROUPING CASES & CONTROLS ACCORDING TO AGE

AGE (YEAR)	CASE	CONTROL	ODD RATIO	95% CI	P VALUE
<20	30(15%)	50(25%)	REF		
20-30	120(60%)	120(60%)	2.778	1.465 to 5.269	0.003S
>30	50(25%)	30(15%)	1.667	0.992 to 2.799	0.07NS



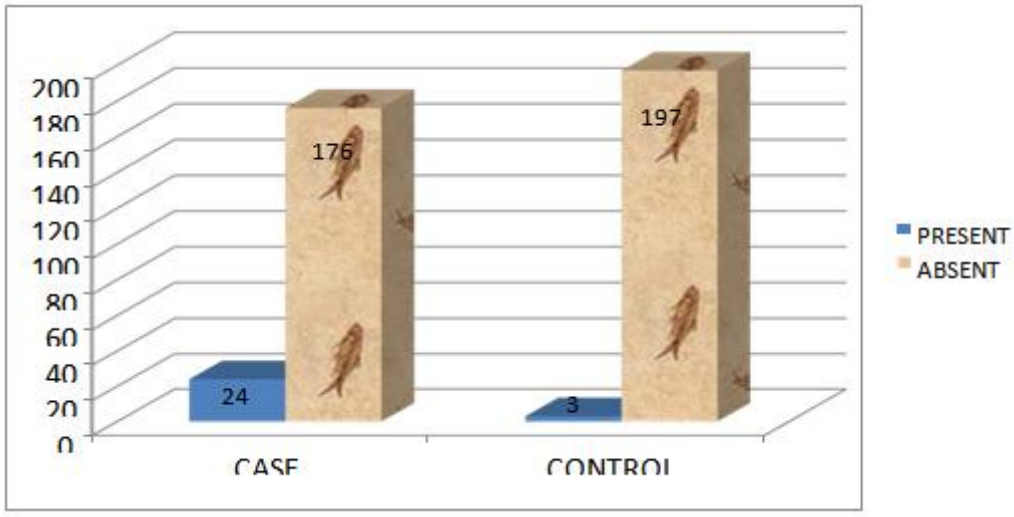
ASSOCIATION OF PREECLAMPSIA WITH CHRONIC HYPERTENSION

CHRONIC HYPERTENSION	CASE	CONTROL	ODD RATIO	95% CI	P VALUE
PRESENT	34(17%)	6(3%)	6.622	2.713-16.164	0.001
ABSENT	166(83%)	194(97%)			
TOTAL	200	200			



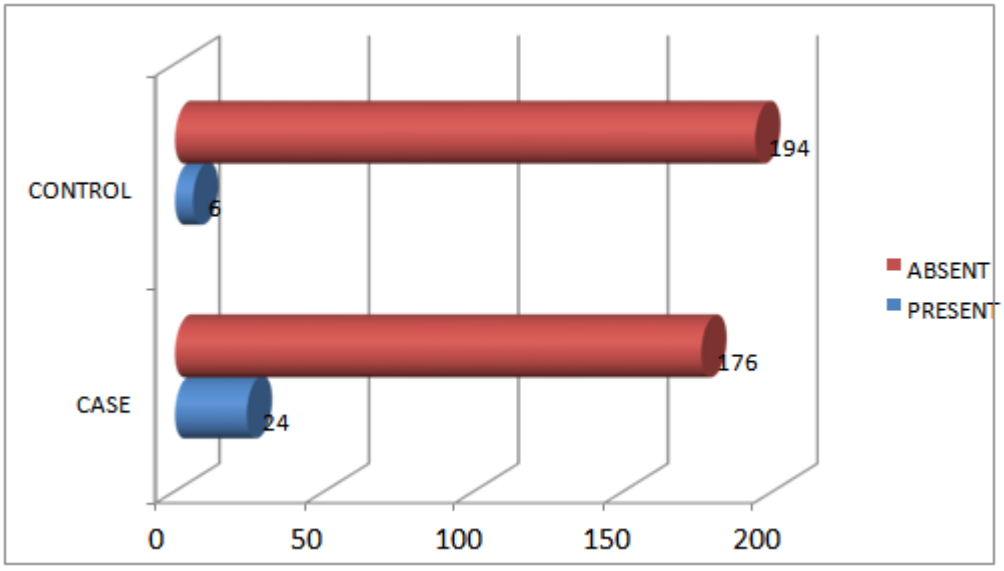
ASSOCIATION BETWEEN PREECLAMPSIA AND HISTORY OF DIABETES

H/O DIABETES	CASE	CONTROL	ODD RATIO	95% CI	P VALUE
PRESENT	24 (12%)	3 (1.5%)	8.955	2.651-30.250	0.001
ABSENT	176(88%)	197(98.5%)			
TOTAL	200	200			



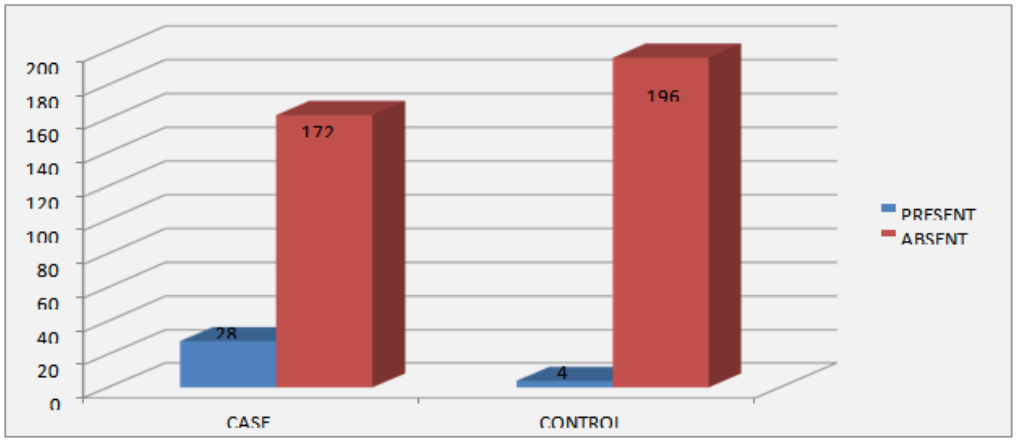
RISK OF PREECLAMPSIA IN WOMEN WITH RENAL DYSFUNCTION

RENAL DYSFUNCTION	CASE	CONTROL	ODD RATIO	95% CI	P VALUE
PRESENT	24 (12%)	6 (3%)	8.955	2.651-30.250	0.001
ABSENT	176(88%)	194(97%)			
TOTAL	200	200			



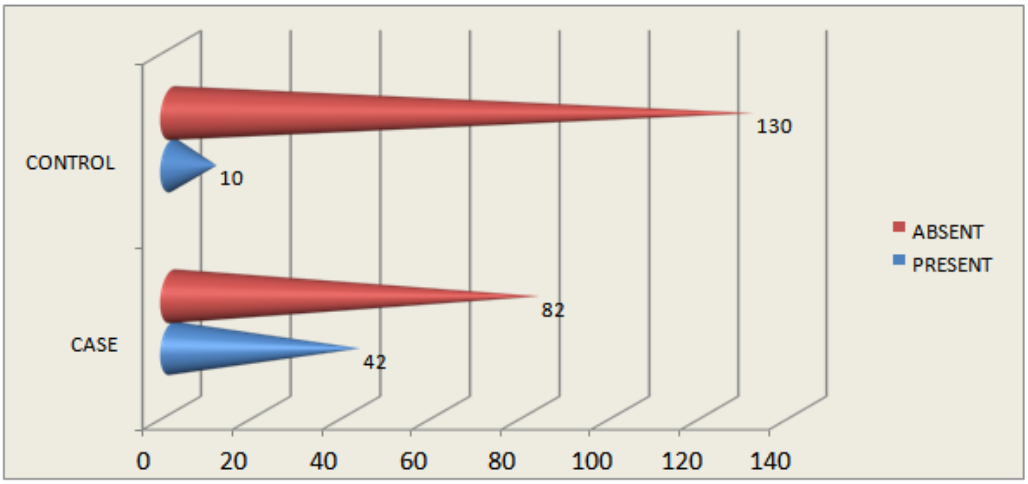
FAMILY HISTORY OF HYPERTENSION AS A RISK FACTOR FOR PREECLAMPSIA

FAMILY H/O HYPERTENSION	CASE	CONTROL	ODD RATIO	95% CI	P VALUE
PRESENT	28 (14%)	4 (2%)	8.469	2.910-24.645	0.001
ABSENT	172(86%)	196(98%)			
TOTAL	200	200			



HISTORY OF PREECLAMPSIA IN PREVIOUS PREGNANCY AS RISK FACTOR

H/O PREECLAMPSIA	CASE	CONTROL	ODD RATIO	95% CI	P VALUE
PRESENT	42(33.8%)	10 (7.14%)	6.659	3.167-13.998	<0.001S
ABSENT	82(66.2%)	130(92.86%)			
TOTAL	124	140			



References

[1]. Martin JN Jr, Owens My, Keise SD, et al: Standardized Mississippi protocol treatment of 190 patients with HELLP syndrome: slowing disease progression and preventing new major maternal morbidity. Hypertens Pregnancy 31(1):79,2012
[2]. Jun Zhang,12 Jonathan Zeisleretal., Epidemiology of Pregnancy-induced Hypertension, The Johns Hopkins University School of Hygiene and Public Health, Vol. 19, No. 2. 4.
[3]. World Health Organization. Geographic variation in the incidence of hypertension in pregnancy. World Health Organization International Collaborative Study of Hypertensive Disorders of Pregnancy. Am J ObstetGynecol, 1988; 158: 80-3. 8
[4]. Khan KS, Wojdyla D, Say L, et al: WHO analysis of causes of maternal death: a systematic review. Lancet 367:1066, 2006
[5]. Berg CJ, Harper MA, Atkinson SM, et al: Preventability pf pregnancy -related deaths. ObstetGynecol 106:1228, 2005
[6]. A Strategic Approach to Reporoductive, Maternal, Newborn, Child And Adolescent Health (Rmnch+A) In India. New Delhi: Ministry of Health & Family Welfare Government of India; January, 2013. 04 p. Available from: http://cghealth.nic.in/ehealth/2016/RMNCH/1_RMNCHA_Strategy.pdf [Assessed on May 12th 2016]
[7]. Ramesh K, Gandhi S, Rao V. Socio-demographic and other risk factors of preeclampsia at a tertiary care hospital, karnataka: case control study. Journal of clinical and diagnostic research: JCDR. 2014;8(9):JC01.
[8]. Roberts JM. Medicine-Principles and Practice. Philadelphia: W. B. Saunders; 1984. Pregnancy-related hypertension; pp. 703–52.
[9]. Lee CJ, Hsieh TT, Chiu TH, Chen KC, Lo LM, Hung TH. Risk factors for pre-eclampsia in an Asian population. Int J Gynaecol Obstet. 2000;70:327–33. [PubMed]
[10]. Eskenazi B, Fenster L, Sidney S. A multivariate analysis of risk factors for preeclampsia. JAMA. 1991;266:237–41. [PubMed]

[11]. Mahomed K, Williams MA, Woelk GB, Jenkins-Woelk L, Mudzamiri S, Madzime S, et al. Risk factors for preeclampsia-eclampsia among Zimbabwean women: Recurrence risk and familial tendency towards hypertension. J ObstetGynaecol. 1998;18:218–22. [PubMed]

[12]. Duckitt K, Harringt D. Risk factors for pre-eclampsia at antenatal booking: Systematic review of controlled studies. BMJ. 2005;330:565. [PMC free article] [PubMed]

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