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CLINICO-SOCIAL RISK FACTORS FOR PRE ECLAMPSIA : A HOSPITAL BASED STUDY

Gynaecology

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ABSTRACT

Objective : To study the clinico-social risk factors for preeclampsia in a tertiary care hospital in Bhubaneswar, Odisha.

Methodology : A case control study was done in a tertiary care hospital in Bhubaneswar. Clinical and socio-demographic data was collected from 167 inpatients with preeclampsia and similar number of controls and was analysed.

Results : Majority of the women(63.9%) belonged to the low socioeconomic class with low education level. More than half were overweight(57.3%) and 61% of them were primipara. A significant number of patients(18.5%) gave a previous history of preeclampsia. Insulin resistance also presented as a risk factor.

Conclusion: Though the aetiology of preeclampsia still remains obscure, there are certain risk factors which have remarkable association with the prevalence of the disease. Understanding these will enable the clinicians for early diagnosis and timely intervention.

KEYWORDS

Pre eclampsia, Socio demographic profile, Obstetrics risk factors.

INTRODUCTION:

Preeclampsia is one of the most common complications of pregnancy. [11] It is a multisystemic disorder of the mother that affects the fetus because of uteroplacental insufficiency.[24] It is characterised by the development of hypertension to the extent of 140/90mmHg or more with proteinuria after 20 weeks of gestation in a previously normotensive and non proteinuric woman.

The incidence of preeclampsia is 2-10% depending on the population studied and definition of preeclampsia.[31] It occurs in 4-7% of pregnant women worldwide. It is a major cause of maternal and neonatal morbidity and mortality , the definite aetiology of which still remains unknown. The factors that have been postulated to influence the development of preeclampsia among mothers include diabetes mellitus, obesity, multiple pregnancy, primiparity , personal and family history of preeclampsia and chronic hypertension. In developing countries, evidence of the association between these factors and preeclampsia is scarce.[3,5,12,17] Hence the present study is undertaken to access the role of relevant risk factors in development of preeclampsia.

MATERIALS AND METHODS

A case control study was carried out on women in the inpatient department of a tertiary health care centre in Bhubaneswar. During these two years of study period from January 2016 to December 2018, we identified 216 women with hypertensive diseases of pregnancy of which 167 women were diagnosed with preeclampsia using the current ACOG guidelines. [1]

The control group included 167 normotensive pregnant women at gestational age more than 20 weeks without any complications like diabetes mellitus, renal, cardiovascular diseases or without any chronic medical conditions. A structured questionnaire was designed and information /data was collected on maternal socio demographic, medical, reproductive and lifestyle characteristics, including past and family history. After explaining the aims and objectives, informed consent was taken from each subject participating in the study.

RESULTS:

This study includes 167 cases with preeclamsia and equal number of controls. Table 1 shows socio-demographic characteristics and their association with preeclampsia .More than half of the women belonged to the two extremes of age i.e. 25.1% were below 19 years of age and 28.1% were above 35years .Remaining 78 women(46.7%) were between 20-35 years of age.

Majority of the women were educated only up to primary level or below (62.7%). Only 23 cases (13.7%) of highly educated women came to the hospital with preeclampsia. Of the study group 13 women (67.6%) were from rural areas. As this is a referral hospital we get a good no of cases from the primary and community health centres. Most of the women (63.9%) belonged to socioeconomic class IV and V (modified B G Prasad's Classification), 24.5% belonged to class III, 6.5% to class II and the remaining 4.7% were from a higher class I . 136 women (81.4%) were unemployed and only 18.5% were working women.

Table 1: Socio-demographic characteristics of Preeclampsia cases and controls.

Characteristics	PE cases (n)	PE cases (%)	Controls (n)	Controls (%)
Maternal Age				
< 19 yrs	42	25.1%	47	28.1%
20-35 yrs	78	46.7%	94	56.2%
>35 yrs	47	28.1%	26	15.5%
Education				
Illiterate	8	4.7%	11	6.5%
Primary	97	58%	48	28.7%
Secondary	39	23.3%	83	49.7%
Graduate& above	23	13.7%	25	14.9%
Dwelling				
Rural	113	67.6%	108	64.6%
Urban	54	32%	59	35.3%
SES(modified Prasad's)				
Class I	8	4.7%	11	6.5%
Class II	11	6.5%	25	14.9%
Class III	41	24.5%	79	47.3%
Class IV	93	55.6%	46	27.5%
Class V	14	8.3%	6	3.5%
Occupation				
Unemployed	136	81.4%	124	74.2%
Employed	31	18.5%	43	25.7%

Table 2 shows the obstetrics and clinical characteristics associated with preeclampsia. There was no much significant difference in number of preterm (46%) and term (51%) cases. In our study more than half of the patients were overweight including 11.3% obese patients, although a good number of cases (43%) were with normal BMI. Majority (102 cases) were primipara (61%) and 18 cases(10.7%) had multi-fetal gestation.

Only 31 cases (18.5%) gave a positive family history of preeclampsia and in the rest 136 cases either it was not known or there was no significant history. Similarly only 50 cases (30.5%) gave a positive family history of diabetes mellitus. 4 women (2.3%) had type II diabetes mellitus and 2 cases had gestational diabetes mellitus. As high as 36 cases (21.5%) had a history of PIH in the previous pregnancy.

Table 2: Obstetrics and clinical characteristics associated with Preeclampsia.

Characteristics	Preeclampsia (n)	Preeclampsia (%)	Controls (n)	Controls (%)
Gestational age				
Preterm	76	46%	13	7.7%
Term	91	54%	154	92.2%
Pre-pregnancy BMI(kg/m^2)				
<25	71	43%	128	76.6%
25-30	77	46%	28	16.7%
>30	19	11.3%	11	6.5%
Parity				
Primipara	102	61%	88	53%
Multipara	65	38.9%	79	47%
No. of fetus				
Singleton	149	89.2%	156	93.4%
Multiple(twin)	18	10.7%	11	6.5%
Family history of HTN/PE				
Yes	31	18.5%	7	4.2%
No	136	81.4%	160	95.8%
Family history of DM				
Yes	51	30.5%	13	7.7%
No	116	69.4%	154	92.2%
Personal history of DM				
Yes	4	2.3%	nil	nil
No	163	97.6%	167	100%
Personal history of GDM				
Yes	2	1.1%	nil	nil
No	165	97.6%	167	100%
Previous history of PIH				
Yes	36	21.5%	nil	nil
No	131	78.4%	167	100%

In table 3, fetal outcome is shown in which maximum number of cases i.e. 124 (74.2%) were term gestation, 20 cases (11.9%) were between 34-37 weeks of gestation, and the remaining 13 cases (7.7%) were below 34 weeks of gestation. More than half of the babies (56.7%) were born with normal weight, 64 babies(38.3%) were between 1.5-2.5 kgs and only 8 of them (4.7%) were grossly underweight. 38 newborns were shifted to NICU and 12 newborns died in the early neonatal period.

Table 3 : Fetal outcome in Preeclampsia cases

Characteristics	Preeclampsia (n)	Preeclampsia (%)	Control (n)	Control (%)
Gestational age at birth in weeks				
<34	13	7.7%	4	2.3%
34-37	20	11.9%	9	5.3%
>37	124	74.2%	154	92.2%
Birth weight(kg)				
<1.5	8	4.7%	2	1.1%
1.5 – 2.5	64	38.3%	33	19.7%
>2.5	95	56.8%	132	79%
NICU admission				
Yes	38	22.7%	14	8.3%
No	129	77.2%	153	91.6%
Perinatal mortality				
Stillborn	2	1.19%	1	1.19%
Early neonatal death	12	7.1%	7	4.1%

DISCUSSION:

Preeclampsia is a major cause of maternal and perinatal morbidity and mortality, the cause of which is unknown. The incidence of preeclampsia is more in developing countries. In hospital practice, the incidence in India varies from 5-15%. Increased maternal age is considered as one of the essential risk factors of preeclampsia.[7,31] This is due to increased villous reaction leading to preeclampsia in women more than 30 years of age. This has been conclusively found in various studies.[3,11,19,28] In our study, the maternal age in patients with preeclampsia is significantly higher in cases as compared to controls, which is very similar to the findings of Sahu et al.[7] The US nationwide data proposes that the danger of PIH increases by 30% for each additional year of age past 34, though some studies conclude that younger maternal age is a significant risk factor for preeclampsia.[7] According to some other studies, PIH is more often developed in young primipara and old multipara having a bimodal probability. [2,4,6,26)] In this study, we found that increasing age of the mother is a significant risk factor in the development of preeclampsia.

Low level of education in pregnant women contributes to an increased risk of preeclampsia. In the present study, a majority of the women with preeclampsia were educated only up to primary level or below, which constituted around 58% of the total cases, whereas the incidence of women who were educated beyond secondary level was little lower i.e. 40%.This is similar to a study done by Lindsay M Silva et al.[29] On the contrary Sikha Saxena et al found in their study that there was a higher incidence of preeclampsia observed in literate women.[29]Our findings may be attributed to the lower level of health education and lack of awareness or hesitation in seeking medical care.

Low socioeconomic status acts as a risk factor for preeclampsia. Women in this group tend to ignore ailments and symptoms associated with pregnancy and cannot afford to utilize the available health care services at nearby hospitals. Therefore their visit to the hospitals is not as frequent as those of literate women with higher income(Sikha Saxena et al).[29]

Apart from reduced antenatal care, low socioeconomic factors are also associated with nutritional issues and unsatisfactory hygienic conditions (Ramesh K et al).[3] Our study has similar findings as majority of women having preeclampsia belonged to the lower and lower middle class.(63.9%).[3] In another study conducted by Sachdeva et al, the incidence of preeclampsia was found to be high in rural women .(8) In our study too most of the women were rural and semiurban dwellers who came to our hospital as referred cases.

Obesity and overweight before pregnancy also appear in our study as a risk factor for developing preeclampsia. Similar results were seen in a study conducted by P. Merviel et al[8] and L Bodnar et al.[14] Some postulate that hypertension occurs during pregnancy in obese patients due to an increase in cardiac output, while others suggest hyperlipidemia promotes the production of peroxide which leads to an impairment of endothelium leading to vasoconstriction.[8]

In this study we found 61% of preeclampsia cases were primigravida and shows decreasing trends with increasing gravidity. In another study by Sikha Saxena et al[29], 57.1% of the cases were primipara. Many other studies have reported nulliparity as an important risk factors for pre-eclampsia.(3,7,15) This may be because most nulliparous patients are younger with more chances of failure of the normal invasion of the trophoblastic cells leading to maladaptation of spiral arterioles which are related to the causation of preeclampsia.[30]

In this study we tried to ascertain a family history of hypertension and diabetes mellitus at the time of admission. It was found that there is an increase in incidence of family history of diabetes mellitus and hypertension amongst the cases as compared to the controls. This reflects genetic and behavioural factors, predisposing women to an increased risk of preeclampsia. Our observation of an association between parental history of chronic hypertension and risk of preeclampsia is consistent with several previous reports.[2,5] Chungfang Qui et al found in their study that parental history of type II diabetes mellitus while occurring in conjunction with chronic hypertension is in association with an increased risk of preeclampsia.[2]

Patients with previous pregnancy complicated with preeclampsia have increased risk of recurrence in subsequent pregnancies. In our study as

high as 21.5% of women gave a history of preeclampsia in their previous pregnancies which is nil in the control subjects.

Studies done during pregnancy suggest that insulin resistance predates the development of preeclampsia implying that insulin resistance may play a role in its etiology. [3,27] But in the present study only 6 women(3.5%) had insulin resistance which included both type II diabetes melliltus and gestational diabetes mellitus patients.

Pregnancy associated with preeclampsia is associated with high incidence of perinatal morbidity and mortality especially when it complicates the pregnancy at an earlier gestational age. Adverse fetal outcome included low birth weight and preterm infants, associated morbidity and perinatal loss. Babies delivered before 37weeks of gestation had higher rates of NICU admission and longer neonatal hospitalisation than babies of normotensive women of the control group. This is similar to a study done by Habli M.et al.[24]

CONCLUSION :

Preeclampsia has a significant adverse effect on the health of the mother and the fetus.From our study we conclude that there are many risk factors which are strongly associated with the development of preeclampsia. Understanding this association will definitely contribute to an early diagnosis and will enable the clinicians for effective and timely interventions to reduce morbidity and mortality of both mother and fetus.

REFERENCES

1. American college of Obstetricians and Gynaecologists. Hypertension in pregnancy. ACOG Technical Bull.1996;219:1-8.
2. Baumwell S, Karumanchi SA. Preeclampsia: Clinical manifestation and molecular mechanisms.Nephron Clin Pract 2007;106(2):72-81.
3. Chungfang Qui,Michelle A.Williams,Wendy M.Leisenring,Tanya K.Sorensen, Ihunnaya O.Frederick,Jennifer C.Dempsey,David A.Luthy. family history of hypertension and type 2 diabestes in relation to preeclampsia risk (HTN:2003:41:408-413).
4. Didly GA,Belfort MA,Simulian JC. Preeclampsia recurrence and prevention.Semin perinatal 2007;31(3):135-141.
5. Eskenazi B,Fenster L,Sydney S. A multivariate analysis of risk factors for preeclampsia.JAMA 1991:266:273-241.
6. Grimes DA,Gross Gle. Pregnancy outcome in black women aged 35 years and old.Obstet Gynecol 1981:58(614-620).
7. Hernandez Diaz.S,Toh.S. Risk of preeclampsia in first and subsequent pregnancies :prospective cohort study. Brit Med J2009;18:338:2255.
8. International journal of universal pharmacy and life sciences,2011;1(3):61-70. A study of incidence and management of PIH in Central Gujurat,India
9. Jasovic- Siveska E,Jasovic V,Stoilova S.Indexed and abstracted in Science citation Index expanded in journal reports 2011:112(4) 188-191
10. Kirsten DuckiH,Deborah Harrington.Risk factors for preeclampsia at antenatal booking:systemic review of controlled studies.BMJ 2005:330:565.
11. Lamminpaa R.Vehivilainen Julkunen K,Gissier M,Heionen S:BMC Pregnancy child birth 2012:11:12:46.
12. Lee CJ,Hsieh TT,Chiu TH,Chen KC,Lo LM,Hung TH.Risk factors for preeclampsia in Asian population:International Journal Gynaecol Obstset 2000:70:327-333.
13. Lindsay M Silva,Marianne Coolman,Eric A.P. Sleegers,Albert Hofman 2008 Wolters Kluwer Health/Lippincott Williams and Wilkins.
14. L Bodnar,Ness R,N Markovic,Roberts J.The risk of Preeclampsia rises with increasing pre pregnancy BMI :Development of a monogram to predict occurance of Preeclampsia. Ann Epidemiol 2005:15(475-482).
15. Marvicl P.Touzart L,Deslandes V et al. Risk factors of preeclampsia in a single pregnancy Gynaecol Obstet Biol.Reprod.Paris 2008:37:477-482.
16. Madhusudan Upadya,Sumesh T Rao. Hypertensive disorders in pregnancy.2018 International Journal of anaesthesia 675-681.
17. Mohamed .K,Williams MA,Woelk G B. Risk factors for preeclampsia among Zimbambean women.Recurrence risk and familial tendency towards hypertension.J Obstet Gynaecol 1998:18:218-222.
18. M.knuist ,G.J.Bonsel,HA Zondervan,P.E Treffers.1998 International journal of gynaecology and obstetrics:61(127-133).
19. Najman J M.Morrison J,William GM et al. Unemployment and reproductive outcome ,an Australian study.1989;96:308-313.
20. Parretti E ,Laplolta A,Dalfra M,Pacini G Mari A,Lioni R et al.preeclampsia in lean normotensive normotolerant pregnant women can be predicted by simple insulin sensitivity index.HTN 2006:47(3):449-453.
21. P Mervical,L.Tousazart,V.Deslanders,Mr Delmas,J .Gondry.Risk factors of preeclampsia in single pregnancy.2008.j.jgyn.04.001.
22. Ramesh K,Sangeetha Gandhi,Vishwas Rao.socoi demographic and other risk factors of preeclampsia at a tertiary care hospital,Karnataka,Case control study.
23. Sandhya sivakumar,B. Vishnu Bhat,Bhawana Ashok Badhe.Effect of PIHmon mothers and their babies.Indian Journal of Paediatrics Vol.74,July 2007(623-625).
24. Sahu S,Abraham R,Vedavalli .R,Daniel M.Study of lipid profile,lipid peroxidation and vitamin E in PIH.Indian Journal Physiol Pharmacol @009;53(4),365-369.
25. Sibai BM. Prevention and management of preeclampsia.Obstest.Gynaecol 2005;105(2):402-410.
26. Silva L M,Coolman M,Steegers EA,Jaddoe VW.Moli HA,Hofman A et al. Low socioeconomic status is a risk factor for preeclampsia:the Generation R Study.J.Hypertens,2008;26(6):1200-08.
27. Sibai MB,El Nazer A,Gonzates Ruiz.severe PE in young primigravid women and subsequent pregnant outcome and remote prognosis.Am J.Obstet.Gynaecol 1996.155(5);1011-1016.
28. Sierra – Laguado.J, Garcia RG, Celedon J, Arena Mantilla M, Pradilla LP et al. Determination of insulin resistance using the homeostatic model assessment(HOMA) and its relation with the risk of development of PIH.Am J Hypertens 20:437-442.
29. Sonia Hernabdez Diaz,Sengwee Toh,Sven Chattingius.Risk of PE in first and subsequent pregnancies,prospective cohort study.BMJ 2009:338:b2255.
30. Shikha Saxena,Prem Chandra shrivastava. Sociodemographic profile of PIH in a tertiary care centre.Sch.J.App.Med.Sci.2014;2(6D) 3081-3086.
31. Walter JJ.Severe PE and eclampsia .Bailleres Best Pract.Rest Cl. Obstet Gynaecol 2000:14(1):57-71.
32. WHO International Collaborative Study .Geographic variation in the incidence of HTN in pregnancy.Am .J Obstet Gynaecol;1988:158(1)80-83.
33. Zhang J. Partner change ,birth interval and risk of PE, a paradoxical triangle. Paediatric Perinat Epidemol 2007;21;31-35.
34. Zhang Z,Cheng W,Duan T.Investigation on the cases of PIH.Chung Hua Fu Chan Ko Tsa Chih 1996;155(5):1011-1016.