

FETAL COMPLICATIONS DUE TO PREECLAMPSIA; A CASE CONTROL STUDY

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Abstract

Objective: Purpose of this study was to find out the prevalence of fetal complications in preeclampsia patients.

Materials And Methods: This was a case-control study. Cases included 40 preeclamptic women and controls comprised of 40 normotensive pregnant women grouped according to presence or absence of clinical parameters of preeclampsia. Fetal complications associated with preeclamptic pregnancies and family history of hypertension was recorded.

Results: There was increased incidence of family history of hypertension and of presence of preeclampsia in a previous pregnancy in the cases (p -value <0.001). Still births and premature births were present more in preeclampsia.

Conclusion: The preeclamptic group had an increased incidence of still-births and premature births.

Keywords: Preeclampsia, Hypertension, Pregnancy, Stillbirths, Prematurity.

INTRODUCTION

The most common medical complications in pregnancy are the hypertensive disorders. According to American College of Obstetricians & Gynecologists (ACOG) Committee on Practice Bulletins-Obstetrics, preeclampsia is defined as "Preeclampsia is a new onset hypertension ($>140/90$ mmHg) and proteinuria (>0.3 gm per 24hrs) after 20 weeks of gestation".¹

Preeclampsia is a serious condition. If it is not diagnosed and managed in time, it can lead to eclampsia. Eclampsia is characterized by fits/seizures which can lead to maternal as well as fetal death.² Other complications of preeclampsia are hepatic and renal failure, pulmonary edema and HELLP Syndrome (hemolysis, elevated liver enzymes and low platelet count).^{3,4} It also increases the risk of future cardio-vascular diseases.⁵ It is also responsible for increased risk of preterm deliveries around the world.⁶ Other fetal complications are Intra-uterine growth retardation (IUGR) and perinatal mortality (stillbirths).³

Chances of fetal mortality are more in case of early onset preeclampsia as compared to late onset preeclampsia. This clearly shows that early onset

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preeclampsia is mainly a placental disease in which marked pathological changes occur in placenta. On the other hand late onset preeclampsia is mainly a maternal systemic disease.⁷

Uptil now, preeclampsia remains a big challenge for doctors because its cause is not known and its pathophysiology is complex and poorly understood. At times it's very difficult for the obstetrician to choose between the risks involved for the patient to continue pregnancy and those for the infant's early birth. There are several risk factors for preeclampsia like twin pregnancies, primigravida, past history of preeclampsia, diabetes mellitus, chronic hypertension, obesity and family history of preeclampsia.^{4,8}

MATERIALS AND METHODS

This was a case-control study, conducted in the Gynaecology/Obstetric departments of three tertiary health care centers of Khyber Pakhtunkhwa (KP) province of Pakistan, Lady Reading Hospital (LRH), Khyber Teaching Hospital (KTH) and Hayatabad Medical Complex (HMC) Peshawar.

A total number of 80 pregnant women (aged 15-35 years) were included in this study all of them were in their third trimester of pregnancy. They were divided into two equal groups, one was study group which included 40 preeclamptic women and the second was the control group which included 40 normotensive pregnant women. Preeclampsia was diagnosed on the basis of pregnancy-induced hypertension (systolic 140 mmHg and above, diastolic 90 mmHg and above) and the presence of proteins in the urine sample.

Ethical approval was obtained from the ethical committee of Khyber Medical University, Peshawar. Written informed consents were taken from the head of departments of concerned Gynaecology/Obstetric departments of all the three hospitals and from the subjects involved in the study.

In the form of printed questionnaires, the subjects in both groups were asked about occurrence of preeclampsia in previous pregnancies, fetal complications associated with preeclamptic pregnancies and family history of hypertension.

RESULTS

Table 1; shows the frequency of occurrence of preeclampsia in previous pregnancies in both the

groups. According to this table, only 1 subject out of 40, had a past history of preeclampsia in the control group, whereas in the preeclamptic group 11 patients out of 40 had a past history of preeclampsia. This difference is very significant ($p < 001$). Thus a patient with preeclampsia is likely to suffer from the same problem in successive pregnancies as well.

Fig 1. Graphically represents the percentage of subjects with and without previous history of preeclampsia in the two groups. We can see that in the preeclamptic group 27.5% patients had a past history of preeclampsia whereas in the control group only 2.5% had a positive history.

Table 2 shows the frequency of previous still births among the preeclamptic and normotensive pregnant women. We can see from it that out of 40 preeclamptic women, two patients gave a history of previous 1 still birth, one patient gave a history of previous 2 still births and one patient had previous 3 still births. On the other hand, in the control group out of 40 subjects only 1 gave a history of previous 1 still birth. This clearly shows that the incidence of still births is more in preeclampsia.

Fig 2 graphically shows the distribution of previous stillbirth among the two groups. We can clearly see that the frequency of previous stillbirths is 10% in the preeclamptic group whereas in the control group it is 2.5%

Out of 11 patients (Table 1) who gave past history of preeclampsia, one patient gave a history of preeclampsia in all previous 3 pregnancies which ended in stillbirths, one patient gave a history of 2 preeclamptic pregnancies which also ended in stillbirths, and the remaining 9 patients gave a history of one preeclamptic pregnancy in the past. Out of these 9 pregnancies 2 ended in stillbirths and the remaining 7 ended in induced premature deliveries.

All the 80 subjects in the two groups were asked about the presence of hypertensive disorders among first degree relatives. Table 4 shows that in the preeclamptic group 27 patients out of 40 gave a positive family history whereas in the control group only 12 subjects out of 40 had a positive family history of hypertensive disorders. Thus preeclampsia definitely has a genetic linkage.

Fig 4; shows graphically the percentage of subjects with and without a positive family history

DISCUSSION

Preeclampsia although is a common but a dangerous complication of pregnancy. It causes both maternal and fetal morbidity and mortality.

Preeclampsia is a serious disease which leads

to maternal and fetal morbidity and even mortality worldwide. Presence of placenta is a must for preeclampsia to occur because after delivery of placenta the disease gets cured.^{9,10} The exact cause for preeclampsia is still not known, therefore it is also known as the 'disease of theories'. One theory

Table 1: Comparison of past history of pre-eclampsia in the two groups.

Past history	Patient	Control	Chi-square	P-value
Yes	11	1	11.227	<0.001
No	29	39		

Table 2: Comparison of the frequency of still births among the two groups.

Still birth	Patient		Control	
	No.	Percentage	No.	Percentage
0	36	90.0	39	97.5
1	2	5.0	1	2.5
2	1	2.5	0	0.0
3	1	2.5	0	0.0

Table 3: Comparison of the frequency of premature births among the two groups.

Patient		Control	
Premature births	Percentage	Premature births	Percentage
7	17.5%	0	0

Table 4: Comparison of a positive family history among the two groups.

Family history	Patients	Control	Chi-Square	P-value
Present	27	12	11.538	<0.001
Absent	13	27		

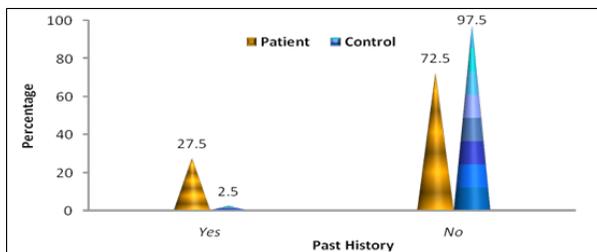


Figure 1: Comparison of percentage of subjects with and without past history in the two groups.

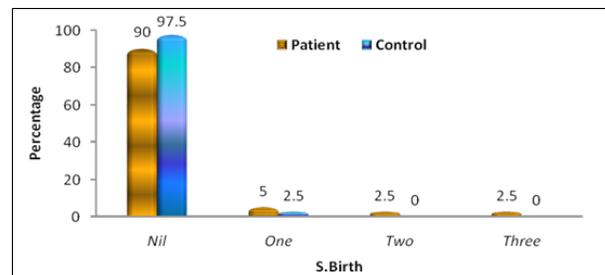


Figure 2: Comparison of frequency of stillbirths in the two groups.

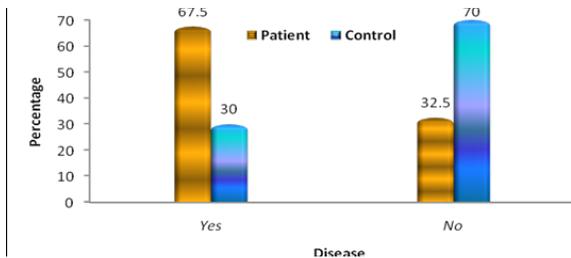


Figure 4: Comparison of percentage of subjects with and without a positive family history in the two groups.

in the two groups. It shows that in the preeclamptic group 67.5% patients had a history of hypertensive disorders among the first degree relatives whereas in the control group only 30% had a family history of hypertensive disorders. This difference is very significant (p-value <0.001).

is that a number of different underlying condition like immunological and or genetic factors alone or in combination with environmental conditions or some underlying disease leads to defective trophoblastic invasion of spiral arteries within the placenta during the first trimester of pregnancy.^{9,10,11} This causes ischemia in the fetoplacental unit which in turn will send a signal to the mother to increase the placental blood flow by increasing maternal blood pressure.

The aim of this study was to find the frequency of fetal complications in preeclampsia in the Khyber Pukhtunkhwa Province of Pakistan. The study included a total of 80 pregnant women during their third trimester of pregnancy. They were divided into two equal groups of 40 each. One group was the preeclamptics (cases) and the second was the normotensive pregnant women (controls). Preeclampsia although is a common but a dangerous complication of pregnancy. It causes both maternal and fetal morbidity and mortality.

If a woman suffers from preeclampsia during her pregnancy there is 10% increased risk of suffering from preeclampsia during her next pregnancies.¹² In our study all the subjects in both the groups were asked about past history of preeclampsia. In the preeclampsia group 11 out of 40 had a positive history whereas in the control group, only one out of 40 gave a history of previous preeclampsia. This is a significant difference ($P=0.001$) as summarized in table 1. and demonstrated in figure 1. Preeclampsia is also attributed to markedly increase the risk for future cardio-vascular diseases. Bellamy et al., showed that preeclampsia increases the risk for future hypertension 4 times and doubles the chances for future thrombo-embolism, coronary heart disease and even cardio-vascular accidents.⁵

Table 2. shows the frequency of still births in the preeclamptic and control groups. The preeclamptic group gave a history of previous 7 stillbirths, whereas in the control group only 1 woman out of 40 gave a history of previous 1 stillbirth. Perinatal mortality or still birth rate is about 59 in 1,000 births in developed countries where as in developing and low income countries it is about 300 still births in 1,000 total births.⁴ Rates are higher if preeclampsia occur early in pregnancy. Very high rates of still births that is more than 800 per 1000 birth occur if severe preeclampsia develops before 24 weeks of gesta-

tion Chances of perinatal mortality is increased in infants affected by Intra-Uterine Growth Retardation (IUGR) or asphyxia.^{13,14} Females with preeclampsia superimposed on chronic hypertension are four times more likely to have a stillbirth.¹⁵

Fig 2. shows the frequency of still births in the preeclamptic and control groups. In the preeclamptic women the percentage of previous stillbirths was 10%, whereas in the control group only 1 woman out of 40 gave a history of previous stillbirth. Thus our study shows that still birth is a common complication of preeclampsia.

Preeclampsia is one of the most common cause for preterm births due to indication for preterm delivery.^{3,10,16} According to Table 3, in the preeclamptic group there was a past history of 11 preterm deliveries, whereas in the control group there was no history of any premature delivery in the past. Premature babies have increased risk of perinatal mortality and morbidity. However preterm newborns of patients having eclampsia or preeclampsia have been exposed to oxidative stress throughout pregnancy. Therefore they are more prone to develop serious diseases of the newborn and hence have increased risk of mortality.^{3,16,17,18}

According to ACOG Technical Bulletin in 2001, a patient with a positive family history of preeclampsia has 5 times increased risk for developing the disease. In our study, the participants were asked about the occurrence of hypertensive diseases in first degree relatives. Table 4 shows that out of 40 preeclamptic women, 27 had a positive family history which is 67.5% whereas in the control group only 12 out of 40 had a family history of hypertensive disorders which is only 30%. Although the exact cause of preeclampsia is still not known, but genetic factors no doubt has a crucial role to play.

CONCLUSION

Preeclampsia still remains a major cause for both maternal and fetal morbidity and mortality. There is increased incidence of still-births and premature births in preeclampsia. The preeclampsia patients have a positive family history of hypertension and increased incidence of pre-eclampsia in future pregnancies.

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