

Research Article

Prevalence of pre-eclampsia and eclampsia risk factors among pregnant women, 2011-2013

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ABSTRACT

Background: Pre-eclampsia is a common problem during pregnancy which complicated 5 to 10 % of total pregnancies and 20 % of first pregnancies. Mothers with pre-eclampsia are at higher risk of maternal and fetal complications. The aim of this study was to estimate the prevalence of pre-eclampsia and eclampsia risk factors among pregnant women.

Methods: In this cross-sectional study in 2011-2013, 592 Pre-eclampsia and eclampsia mothers have been studied. Information gathered by a checklist include information about risk factors of PE&E such as age up 30, family history, abortion, HTN, thrombophilia, diabetes before pregnancy, parity, renal failure, infertility and twin birth from archived files in hospital. Gathered data analyzed by statistical methods in SPSS-19. The level of significance was $p < 0.05$.

Results: From all files 18 cases (3%) were eclampsia and rest of them were Pre-eclampsia (55.2% with mild and 41.7% with sever PE). There was no significant relation between PE and E incidence with variables such as history PE, age, family history, twin birth, abortion, thrombophilia, infertility, renal failure and Urinary symptoms.

Conclusions: Results showed that in Ardabil province, the prevalence of PE was almost similar with other studies. Various factors could be effective in PE and E incidence which between these factors we can point to chronic HTN in mother, diabetic before pregnancy and gravity in this study.

Keywords: Pre-eclampsia, High risk pregnancies, Eclampsia

INTRODUCTION

Pre-eclampsia is the most common medical problem in pregnancy, and its incidence has been reported in different parts of the world. This complication makes pregnancy problematic and is considered as common cause of prenatal and maternal morbidity and mortality in the world.¹ This complication develops in 5-10% of all pregnancies and 20% of first pregnancies and entails more than 40 percent of premature birth resulting from treatment.^{2,3} Due to high incidence rate of pre-eclampsia and its main role in maternal and infant mortality, it is necessary that extensive investigations to be conducted in the society, so that the numerous maternal and fetal complications may be prevented by early diagnosis,

raising individuals, awareness about pre-eclampsia, the mothers regular visits with doctors, and receiving full care during pregnancy. Because of the importance of the disease, many studies have been undertaken on its risk factors. And many risk factors have been identified including null parity, age, race, genetic and environmental factors such as living at high altitudes, obesity, chronic hypertension, and multiple births.⁴

In some other studies, the mother's job, family history of pre-eclampsia, urinary tract infection during pregnancy, mothers low education, the womb's being exposed to DES, a long interval with a previous pregnancy, history of preterm delivery, IUGR, insufficient prenatal care, blood type, low maternal weight at birth, and smoking

have been identified as risk factors.⁵ According to another study, pre-eclampsia in a previous pregnancy, family history, high blood pressure and high body mass index (BMI) are considered as risk factor for pre-eclampsia.⁶

As it is reported, the risk factors vary across different studies and populations, which might be due to genetic factors or other unknown underlying issues. Therefore the studies of that nature should be undertaken in various communities.⁷

Since the process of pre-eclampsia is very complex, it probably cannot be attributed to a single cause. Here upon, further studies on the risk factors in various aspects may help to better understanding of the pre-eclampsia causes. According to studies done in different areas, the overall rate of pre-eclampsia varies from 4.5% to 23%, and the incidence rate of pre-eclampsia is 8.6 per thousand live births.⁸ The aim of this study was to investigate some risk factors for pre-eclampsia and eclampsia in pregnant women in Ardabil city during 2011-13.

METHODS

This was a cross – sectional descriptive study that has been done on 592 women with pre-eclampsia and eclampsia hospitalized in a hospital in Ardabil city during 2011-13. The instrument used in the present study was a checklist containing questions in regard to maternal age, history of previous pre-eclampsia, abortion, hypertension, infertility, thrombophilia. The necessary data were collected by searching through archival record in hospital from 2011 to 2013, and completing checklist. The obtained data was analyzed by SPSS.19 using statistical methods. The significant level was $P < 0.05$.

RESULTS

Totally, 592 cases of pregnant women with eclampsia, severe pre-eclampsia, and mild pre-eclampsia were studied from 2011 to 2013. Of this number 3%, 55.2% and 41.7% had eclampsia, mild pre-eclampsia, and severe pre-eclampsia, respectively. Of entire sample, 341 cases (57.6%) were of 30 years and below, and the rest were over 30 (Table 1). 105 patients (17.7%) had a family history of eclampsia or pre-eclampsia, of whom 2 patients (1.9 %), had eclampsia, and 103 (98.1%) had mild and severe pre-eclampsia. Among women with a history of abortion, 2.9% had eclampsia, and the rest had pre-eclampsia. Of mothers with a history of infertility, 2.7% were patients suffering from eclampsia and the remainders were those with pre-eclampsia. And in mothers with four or more pregnancies, the incidence rate of mild pre-eclampsia was about 2.2 times more than severe pre-eclampsia. Of all mothers with renal insufficiency, 1.7% had eclampsia and the rest were those with pre-eclampsia. The incidence rate of mild pre-eclampsia was approximately 1.5-fold, compared to severe pre-eclampsia. Concerning women with urinary

symptoms, 3.6% were of eclampsia and others had pre-eclampsia, and the incidence rate of mild pre-eclampsia among them was about twice higher than Severe pre-eclampsia. The results of statistical analysis didn't find any significant relationship between incidence of eclampsia or pre-eclampsia and history of previous pre-eclampsia, age of mother, history of preeclampsia or eclampsia in close family, twinning, abortion, thrombophilia, renal insufficiency, infertility and urinary symptoms. Of all pregnant women with chronic hypertension, 4.7% were those with eclampsia and the rest had pre-eclampsia. Of mothers with pre-gestational diabetes, 1.2% had eclampsia and the rest had pre-eclampsia. And in women with history of diabetes, 67.1% were with mild pre-eclampsia, and 31.7% with severe pre-eclampsia. There was a significant relation between the history of diabetes before pregnancy, chronic hypertension, parity and the incidence of pre-eclampsia or eclampsia. According to the total number of women admitted to the maternity ward (19,440 people) during study years, the estimated incidence of eclampsia and pre-eclampsia was 30.4 per thousand people which the prevalence of eclampsia, severe Pre-eclampsia and mild Pre-eclampsia were 0.09%, 1.27% and 1.68%, respectively.

DISCUSSION

In the present study, of the cases under study, 18 women (3%) had eclampsia and the rest (97%) had pre-eclampsia. Moreover, of those with pre-eclampsia, 55.2% suffered from mild preeclampsia, and 41.7% from severe pre-eclampsia and these rates were lower than those reported in the study of Ehdavand and colleagues. This diversity can be perhaps due to the development of services and prenatal care, high quality services in hospitals, improvement of hospital facilities, and the mothers' increased awareness of health care.

The result of this study showed that the prevalence of severe pre-eclampsia is not concordant with the findings of the study conducted by Kahnamouei and colleagues in 2000.⁹ They showed that the incidence rate of severe pre-eclampsia and mild pre-eclampsia was 49.8% and 42.3%, respectively which can be ascribed to prenatal care, forming pregnancy book, referral of high risk women to specialized centers, and receiving feedbacks from their doctors and finally early hospitalization.

Numerous studies have shown that unpleasant consequences of pregnancy such as preterm delivery, intrauterine fetal growth retardation, placental abruption, visual impairments, coagulation abnormalities, elevated liver enzymes, renal failure, seizures and coma are very common in severe pre-eclampsia and eclampsia. Our study showed the effectiveness of some factors including chronic hypertension, pre-gestational diabetes, and parity in the incidence of pre-eclampsia, however other risk factors had no effect on its incidence. To examine the hypothesis that if the history of previous pre-eclampsia

and eclampsia is involved in its incidence, the present study was conducted and it was found that 28.9% of the mothers had a history of previous pre-eclampsia, of whom 94.7% had pre-eclampsia and 5.3% had eclampsia. Hereupon, it can be claimed that in women with previous history of pre-eclampsia the incidence rate of pre-eclampsia was greater than eclampsia. Whereas it was predicted that having a history of previous pre-eclampsia may affect the incidence of eclampsia or pre-eclampsia, the results of the present study, compared with other studies that considered these factors effective in the incidence of pre-eclampsia or eclampsia, didn't show statistically significant results.¹⁰

Examining the relationship between age and pre-eclampsia revealed that 7.6% of mothers aged below 30 of whom 97.3% were with pre-eclampsia and only 2.6% with eclampsia. Likewise, in mothers above 30 years, the incidence rate of the pre-eclampsia and eclampsia was 96.4% and 3.6%, respectively. Taking the findings of other studies done in different areas into account that have demonstrated the influence of age on pre-eclampsia incidence, it was expected that age to be an effective factor in the incidence of pre-eclampsia and eclampsia but it was not.

As other effective factor in the incidence of pre-eclampsia and eclampsia we can refer to history of eclampsia or pre-eclampsia in family. In this study, the proportion of incidence of pre-eclampsia was higher in the mothers with family history of pre-eclampsia and eclampsia than other mothers. It should be mentioned that perhaps due to large sample of the previous research studies the efficacy of this factor has been proven, however, in this study its effectiveness was not confirmed statistically. Studies in other places have also expressed that a family history partly affects the incidence of pre-eclampsia. As an instance, Mostello and colleagues in their study found that the lower the gestational age at previous pregnancy is, the higher the risk of pre-eclampsia in the next pregnancy, which indicates this factor strongly affects the pathogenesis of the disease.

Another research question of this study was: does twinning have effect on the incidence of pre-eclampsia or eclampsia? The results showed that 4.1% women had twinning that all of them had pre-eclampsia. But 96.8% of the mothers who didn't have twinning were with pre-eclampsia and 2.3% with eclampsia. Thus, it can be concluded that the incidence of pre-eclampsia in mothers with twinning is higher than mothers without. Other conducted studies also have presented the same finding.¹¹

In this study, 23.3% of the mothers with pre-eclampsia and eclampsia had a history of abortion, of which 2.9% had eclampsia and 97.1% pre-eclampsia. The incidence of pre-eclampsia in mothers with abortion was slightly higher than mothers without abortion, but it was not statistically significant and our study confirmed the findings of Safari and colleagues study.

In this study, 95.3% of all the women who had chronic hypertension suffered from pre-eclampsia and 4.7% from eclampsia. In comparison, the women without chronic hypertension, 97.4% were with pre-eclampsia, and 2.6% with eclampsia. Therefore, it can be said that rate of eclampsia was higher in women with chronic hypertension, but lower regarding pre-eclampsia. It can also be mentioned that chronic hypertension is involved in the incidence of pre-eclampsia and eclampsia which is concordant with the outcomes of other studies done in other regions.^{7,9,11,15-17}

Does presence of thrombophilia in women affect pathogenesis of pre-eclampsia and eclampsia? In the entire sample, there was only one woman with thrombophilia who had severe preeclampsia, however, this relationship was not statistically significant. Other studies carried out in other regions haven't found any significant relation between them, as well.¹⁸

Presence or absence of infertility in women and its relationship with incidence of eclampsia and pre-eclampsia was another hypothesis that was tested in this study. Although the incidence of eclampsia and pre-eclampsia in women with infertility was less than those without infertility, the results didn't indicate any significant relationship between them, which supports the findings of other studies undertaken.^{1,17}

Exploring the relationship between the incidence of eclampsia and pre-eclampsia and diabetes before pregnancy, it was found that in mothers with pre-gestational diabetes, the incidence of eclampsia was 13.9% lower than those without diabetes, but the rate of pre-eclampsia was greater among them. And it can be said that this factor can affect the incidence of eclampsia and pre-eclampsia. Therefore, it seems necessary to take proper precautions and effective control over pre-gestational diabetes in women regarding the risk of having pre-eclampsia and eclampsia. Other studies have demonstrated pre-gestational diabetes as an influencing factor.^{8,13,17}

The number of pregnancy has been pointed out as an effective factor in the incidence of eclampsia and pre-eclampsia. In our study the incidence rate of eclampsia and pre-eclampsia decreased by increasing the number of pregnancies. Accordingly, programing for prenatal care in the mothers with first pregnancy seems necessary compared to others. In addition, it is essential that health-care personnel to be trained on and aware of this requirement. There was a significant relation between number of pregnancy and the incidence of eclampsia or pre-eclampsia. Correspondingly, previous studies carried out in other regions have found this factor as an effective one in the incidence of eclampsia and preeclampsia.^{8,4,13,19-21}

Table 1: Frequency of risk factors effective in pre-eclampsia and eclampsia incidence.

Risk factors	type	N(%)
Previous P.E	+	171(28.9)
	-	421(71.1)
Age	<30	341(57.6)
	>30	251(42.4)
History of P.E in family	+	105(17.7)
	-	487(82.3)
Twin birth	+	24(4.1)
	-	568(95.9)
Abortion	+	138(23.3)
	-	454(67.7)
HTN	+	127(21.5)
	-	465(78.5)
Thrombophilia	+	1(0.2)
	-	591(99.8)
Infertility	+	75(12.7)
	-	517(87.3)
G.D	+	82(13.9)
	-	510(86.1)
Parity	1	279(47.1)
	2	140(23.6)
	3	103(17.4)
	4 +	70(11.8)
Renal failure	+	59(10)
	-	533(90)
Urine symptom	+	139(23.5)
	-	453(76.5)

It was hypothesized that renal failure can intervene in the incidence of eclampsia or pre-eclampsia. The results showed that in mothers with renal failure, compared with the healthy mothers, the incidence of eclampsia was lower and of pre-eclampsia was higher, though the difference was not statistically significant. But studies have been done in other places identified it as an influencing factor.^{1,11-12} Another effective factor in the incidence of eclampsia or pre-eclampsia may be the presence or lack of urinary symptoms in mothers that was examined in the current study. It was observed that the incidence rate of eclampsia and pre-eclampsia in both groups mothers was the same and there was no significant difference between two groups. Study conducted by Kashanian and colleagues identified it as a factor influencing the incidence of pre-eclampsia, though this hypothesis was not confirmed in the present study. This divergence in our study may be ascribed to the low incidence of urinary symptoms or flaws in recording information related to mothers.⁴

CONCLUSIONS

The results of this study revealed that the prevalence of pre-eclampsia had no significant difference in Ardabil province compared to other studies. Various factors may be involved in the incidence of eclampsia and pre-

eclampsia, which among them chronic hypertension in mother, diabetes before pregnancy and number of pregnancies can be noted. In order for the mothers to be prevented from having eclampsia or pre-eclampsia during pregnancy, it is suggested that future studies to be undertaken in more detailed ways and over larger sample. Besides, it seems necessary that future research studies devote more attention to investigating the effect of nutritional and pharmaceutical supplements (omega-3) in preventing or reducing this complication, more than ever.

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