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Original Article

Relationship between migraine and hypertensive disorders of pregnancy

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Abstract

Aim: Preeclampsia is a pregnancy-specific syndrome associated with vascular spasm and endothelium dysfunction that leads to reduced organ blood flow. Migraine is a syndrome of benign recurrent headaches, nausea, vomiting, or other signs of neurologic dysfunction. Some studies have shown that women who have a history of migraines during pregnancy are at high risk of preeclampsia. The aim of this was determine the relation between migraine and hypertensive disorders of pregnancy.

Material and Methods: In this case- control study, cases consisted of 100 women with preeclampsia, and controls were 100 normotensive women. All women were hospitalized in Ardabil city hospital and all of them were evaluated for any history of migraine. The two groups were matched for confounding factors. The data were collected by questionnaire including demographic, medical, obstetrics, and migraine assessment sections. Data were analyzed by statistical methods using SPSS version 19.

Results: The mean age of women in study group was 28.12±6.50 and in control group was 25.2±5.75. Majority of persons in the study, were in age group16 to 35 years old and their education levels were high school graduates and they were housewives. The mean of BMI was 24.8. Of people, 11% were suffering from migraine. The history of migraine in the study group was 16% and in the control group was 6% and the difference was significant between two groups (p=0.001). History of migraine headaches in patients with hypertensive disorders was 2.65 times more than women in control group.

Conclusion: Results showed that migraine headaches to be associated with gestational hypertension and history of any migraine could be as a risk factor for PE /gestational hypertension (GH) in future.

Keywords: Gestational hypertension; migraine; preeclampsia.

INTRODUCTION

hypertensive disorders are the most common complications of pregnancy that occur in 1-10% of pregnancies (1). These disorders together with bleeding and infection causes 28.2% of maternal mortality and pregnancy-related complications (2). hypertensive disorders during pregnancy are classified into 4 categories, as recommended by the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy: 1) chronic hypertension, 2) preeclampsia-eclampsia, 3) preeclampsia superimposed on chronic hypertension, and 4) gestational hypertension (transient hypertension of pregnancy or chronic hypertension identified in the latter half of pregnancy) (3-4).

Preeclampsia reduces platelets , increases liver enzymes, hemolysis and eclampsia causes to damage vital organs such as brain, liver and kidneys (1). Preeclampsia also causes many fetal complications, including intrauterine growth restriction , abnormal heart rate, low Apgar score and need for intensive care unit (4). Risk factors of preeclampsia include chronic kidney disease, chronic blood pressure , familial history of preeclampsia , multiple pregnancy, null parity , new sexual partners , mothers under the age of 19 and over 40 , diabetes, obesity , incompatibility of the Rh blood group and poor socio economic status (5). Preeclampsia and hypertensive disorders during pregnancy have common pathogenesis and epidemiologic features of migraine and both are associated with an increased risk of ischemic stroke . Migraine, a common chronic-intermittent disorder of idiopathic origin characterized by severe debilitating headaches and autonomic

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nervous system dysfunction, and preeclampsia, a hypertensive disorder of pregnancy, share many common epidemiological and pathophysiological characteristics (6-7). Platelets and prostaglandins are thought to be involved in the pathophysiology of gestational hypertension and migraine . Gestational Hypertension is due to an increase in the prostacyclin-to-thromboxane A2 ratio. Thromboxane A2 which has vascular contraction potential and platelet aggregation is made in platelets. Drugs such as sodium naproxen and aspirin which inhibit the production of prostaglandin and platelet aggregation, have a significant role in preventing recurrence of migraine. Therefore, probably migraine is associated with an increased risk of gestational hypertension (8). The aim of this study was to investigate the relationship between migraine and gestational hypertension disorders in pregnant women referred to Ardabil city hospital.

MATERIAL and METHODS

This retrospective case control study that was conducted on 200 pregnant women referred to gynecology ward of Alavi hospital in Ardabil city. This study approves by University ethics committee by number REC. ARUMS.2018.438.The patients were admitted to two groups with a history of preeclampsia and eclampsia with normal blood pressure each with 100 women. Sampling was done randomly. The data collection tool was a questionnaire containing demographic information such as age, level of education, occupation and clinical information such as BMI, parity, number of delivery, history of OCP use, history of hypertension in previous pregnancy and its outbreak in first degree relative, history of migraine and type of it. Exclusion criteria included women with chronic hypertension , kidney disease , diabetes , connective tissue disease, history of smoking and multiple pregnancies . SPSS version 19 was used to analyze the data. To test the differences between quantitative and qualitative variables t-test and chi-square test were used respectively and the odds ratio was used to determine the ratio of migraine headaches .

RESULTS

There were no significant differences between the groups regarding age, and employee status, primiparity, and educational status (p=0.070, p=0.40, p=0.10, p=0.070). (Table 1)

Table 1. Demographic data of women

Age	16-26	120 (60)
	27-36	70 (35)
	37-46	10 (5)
	26.7 ± 12.6	
Education status	Illiterate	14 (7)
	Diploma and under	150 (75)
	Academic	36 (18)

In study groups , 49 neonates and in control group 53 neonates were girls .The average body mass index 24.8 kg/m^2. There were no significant difference between the average BMI , number of pregnancies , number of abortion and number of deliveries between two groups (p=0.20, p=0.30, p=0.090, p=0.10, respectively) (Table 2). Of women in the study and control groups 25% and 22% had history of contraceptive use which wasn't statistically significant (p=0.090) . Of women in the study and control group 16% and 6% had a history of migraine which was significant between two groups (p=0.001) but there was no significant difference in the type of migraine between two groups (p=0.70). The results of the odds ratio indicated that the history of migraine headaches in the group with gestational hypertension was 2.65 times more than the control group [OR=2.65, 95%CI:1.9-4.5]. Of women in the study group, 23% had a history of hypertension in their previous pregnancies which was significantly higher than control group (p=0.003) (Table 3). The incidence of severe preeclampsia in women with a history of migraine was 10% and the history of migraine in women of case group significantly higher than women of control group (P =0.001) .

Table 2. The mean of individual characteristics and pregnancy by groups

Characteristics		Groups	Min	Max	Median	mean±sd	p-value
Individual	Age (mean±sd)	Case	16	40	27	28.12 ± 6.50	0.1
		Control	18	46	26	25.28 ± 5.75	
	BMI (mean±sd)	Case	18	30	25.5	25.56 ± 6.03	0.2
		Control	18	28	25	24.15 ± 3.99	
Pregnancy	Parity (mean±sd)	Case	1	3	2	2.06 ± 1.51	0.3
		Control	1	2	1	1.74 ± 0.93	
	Number of delivery (mean±sd)	Case	1	2	1	1.57 ±1.05	0.1
		Control	1	2	1	1.55 ± 0.76	
	Number of abortion (mean±sd)	Case	0	1	0	0.35 ± 0.82	0.09
		Control	0	1	0	0.18 ± 0.38	

Table 3. Clinical Characteristics of women in two groups

Clinical Characteristics	Groups	Case		Control		p-value
		%	n	%	n	
History of uses OCP		25	25	22	22	0.09
History of HTN in previous pregnancy		23	23	2	2	0.003
Prevalence of HTN in first degree relative of women		32	32	21	21	0.1
History of migraine	Common	16	16	6	6	0.001
Type of migraine	Classic	13	81.2	83.3	5	0.7
		3	18.8	16.7	1	

DISCUSSION

Hypertensive disorders are the most common complication of pregnancy that involved 5% to 10% of all pregnancies. The results of this study showed that the history of migraine in the group with gestational hypertension was 2.65 times more than the control group . In the study of Facchinetti et al in 2006, it was found that migraine without urea in the group with gestational hypertension was 4.59 fold higher than control group (9). In the study of Adeney et al in 2005, results showed that a history of migraine with a risk of 1.8 increased preeclampsia compared to the control group and women who were more than 30 years in diagnose time of migraine had a 2.5 fold higher risk than others (10). The results of Marcoux et al study showed that 16% of preeclamptic patients and 12% of hypertensive people had a history of migraine headache. In the present study, 16% of mothers in study group had a history of migraine which was in line with the study of Marcoux et al (8). In another study by Moore et al, 33% of women with preeclampsia and 6% of women in control group had a history of migraine and in the recent study 6% of the control group had a history of migraine (11). Although the primary mechanism of migraine and preeclampsia is poorly known but the increased vascular reactivity and endothelial damage associated with platelet aggregation and increased vascular contraction observed in patients with preeclampsia is a typical characteristic of migraine patients. In the present study, the prevalence of migraine in women with preeclampsia was higher than that of normal blood pressure (12). The results of this study showed that there was no significant difference between the two groups in terms of overweight but results of a study showed that overweight in migraineurs women compared with non- migraineurs women had a 12-fold increased risk of preeclampsia (13).

In this study, of women in the study and control groups respectively 25% and 22% had history of contraceptive use which wasn't statistically significant. In a study by Andrea et al, the results showed that hormonal contraceptive options were associated with headache that was similar to our study results (14).

CONCLUSION

A history of migraine headaches could be a risk factor for the occurrence of gestational hypertension and further studies can show that severe preeclampsia as an important risk factor has a stronger relationship with migraine headaches in compare to mild preeclampsia .

Limitation

The only limitation in this study could be that preeclamptic women with headache may be remembering their headaches more than other women did and it could be a bias in analysis data.

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