International Journal on Obstetrics and Gynecology

Pre-eclampsia Risk Factors in Patients Treated at Guayaquil University Hospital

Research Article

Volume 1 Issue 1- 2021

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Article History

Received: November 23, 2021 Accepted: December 11, 2021 Published: December 13, 2021

Abstract

Objective: The objective of this research is to determine the risk factors of hypertensive pregnancy disorders in pregnant women who attended at prenatal care at the Universitary Hospital of the City of Guayaquil. Materials and methods: descriptive study, quantitative longitudinal cohort, executed in a group of 104 pregnant patients who attended the prenatal control. Techniques to acquire information were based on the application of a survey previously validated by experts and documentary review (medical records). These methods found variables which allowed identifying the risk factors in the hypertensive disorders of pregnant women. Results: Age distribution was in three ranges: under-19 (20.2%), 20 to 34 years (69.2%) 35 years (10.6%). The risk factors were: weight gain (41.3%), family history related to hypertensive alteration (30.8%), Poor nutrition (50%) marital status free union (54.8%), premium parity (35.6%) more than two couples (23.1%) hypertensive disease (13.5%) Conclusions: Risk factors of personal and family history of hypertensive disorders were observed in (30.8%), nutritional factor, prima parity and partner change took an important place; there are questions debatable risk factors that were taken into account. Prenatal control was not representative because patients attended their control as part of their study.

Keywords: Hypertension; Pregnant women; Risk Factors; Pre-Eclampsia

Introduction

The millennium goals propose the reduction of maternal mortality from 1990 to 2015 by three quarters [1]. Maintaining health during pregnancy is a right and, providing preventive measures, will improve the results for the mother and the child, given that there are risks that can affect the integrity of both, an example is hypertensive disorders of pregnancy [2]. There are risk factors for hypertensive disorders of pregnancy such as: maternal age under 20 and over 35 years; the first pregnancy; personal and family history of disorders in previous pregnancies; molar pregnancy in nulliparous; presence of chronic diseases, obesity, diabetes mellitus, malnutrition, low calcium intake, alcohol consumption, low socioeconomic status, and poor prenatal care [3]. The world health organization (WHO) [4], proposes "a priority health program in the world", aimed at reducing maternal deaths; that represent 80% of direct causes and 20% of indirect. In Ecuador, in 2015 the estimate of maternal mortality was 150 in 336,441 newborns, of which 60% during pregnancy [5]; The goal of the Millennium Development Goals (MDG4) seeks to reduce maternal deaths in Ecuador by a third during 1990 - 2015 [1]; Direct

attention to the prevention and control of risk factors dependent on the mother, the product or the environment. Hypertensive disorders in pregnant women were one of the leading causes of hospital admissions and the leading cause of maternal morbidity between December 2009 and December 2011 [6]. The study on the prevalence of hypertensive disorders in controlled pregnant women shows a significant relationship (p = 0.014) between blood pressure and edema [7]. Chronic hypertensive disorders produce vascular damage that can cause trophoblast deoxygenation and favor the onset of pre-eclampsia [8].

Concluding that the peripheral arteriolar resistance, is determined by the tone and state of the arterioles, complicates 10% of pregnant women and is an important cause of maternal and fetal morbidity and mortality [9]. Therefore, an increase of 30 mmHg in systolic blood pressure and 15 in diastolic blood pressure is an alarm sign that must be strictly monitored during pregnancy, although it is not proving for the diagnosis of arterial hypertension (HTN).

The precise etiology of this entity remains a mystery, there is important evidence that points to inadequate trophoblastic invasion of the maternal spiral arteries as the underlying cause [10]. Histopathological evidence of a defect in placentation or an immunogenic mechanism; This is how some risk factors for hypertensive disorders of pregnancy would be correlated with a deficient perfusion in the placenta [11]. However, there is no typical patient that allows us to identify her prior to clinical manifestations.

Risk factors for pre-eclampsia in some epidemiological studies their association is questionable [12-14]. Among them it is worth mentioning: sudden changes in the climate, urinary tract infections during pregnancy, marital status, height, blond or red hair compared to brown and separation of the upper incisors, educational level, residence in cities compared to rural areas.

The objective of this research is to determine the risk factors of hypertensive disorders of pregnancy in pregnant women who attend prenatal consultation at the Universitary Hospital of the City of Guayaquil - Ecuador

Material and methods

Descriptive, observational study of a longitudinal cohort, carried out on a population of 130 pregnant patients who attended the prenatal check-up at the Universitary Hospital of Guayaquil-Ecuador, from January 2019 to January 2020. The techniques to acquire information were based on the application of a survey previously validated by experts and the review of medical records. Through these methods, variables were recorded that made it possible to identify risk factors for hypertensive disorders in pregnant women.

Age was evaluated as it was considered a risk group, those under 19 years of age were grouped as adolescents, young women between 20 and 34 years of age, and adults over 35 years of age. Those younger than 19 and older than 35 years were considered a risk factor.

Regarding parity, the woman who had never given birth was grouped as nulliparous and having had one or more children or if the current pregnancy was with a new spouse was considered a risk factor. Regarding the occupation of the pregnant woman, she was considered a housewife, student, and others who corresponded to various trades. Folic acid intake from the beginning of pregnancy was recorded. Complications that occurred during pregnancy from the beginning until ending the study. Patients who did not complete the study, chronic arterial hypertension, chronic renal failure, diabetes, and multiple pregnancies were excluded.

For the information processing, the data of each variable was collected and presented through frequency distribution in absolute and relative values in Excel tables.

Ethical aspects: *The research project was approved by the Teaching and Research Committee of the Guayaquil Universitary Hospital (Authorization No. 0131-2018-DI-HUG). The patient and two witnesses were requested to sign informed consent. The confidentiality of the information was guaranteed. The principles of justice, respect and beneficence were guaranteed. The pregnant women at risk of presenting hypertensive disorders were explained the condition and their consultation with the health services was ensured as appropriate.*

Results

Of 130 patients who entered the study, only 104 finished, 26 patients were excluded because they did not meet the inclusion criteria. When analyzing maternal age, those under 19 and over 35 represented 20.2% and 10.6% respectively. Multiparous women predominated with 64.4% and primiparous patients with 35.6%, pregnant women who had a pregnancy with a new spouse was 23.1%. Regarding the mother's occupation, 56% were housewives, 14.3% students, and 30.6% various jobs. 54.8% their marital status was free union; 55.1% had secondary education; and their residence, 58.7% were from the marginal urban area; their diet was moderate the consumption of foods rich in cereals with 53.6% and 51% rich in protein; 30.7% had a history of hypertensive disorders (Table 2). During the pregnancy follow-up, all the patients consumed folic acid from the beginning of the study; 21.4% presented hypertensive disorders of pregnancy, of which 8.6% had gestational hypertension and 4.8% pre-eclampsia; proteinuria 4.8% and weight gain 39.1% (Tables 1,3,4).

Table 1: Characteristics of the population.

Variable		Average
Age		26.33 + 6.86
Initial Weight		65.64 + 15.01
Systolic TA		110 (66-144)
Diastolic TA		68 (44 - 98)
History of Pre-eclampsia	Yes	32 (30.7%)
	No	72 (69.3%)
Gestation	Primigravity	37 (35.6%)
	Multiparous	67 (64.4%)

Table 1 describes the initial values of the study in terms of age, weight, blood pressure, history of pre-eclampsia and number of pregnancies.

Table 2: Risk Factors for Gestational Hypertensive Disease.

Variable		Patients (n = 104)
Age	Less than 19 years	21 (20.2%)
	Over 35 years old	11 (10.6%)
	20 - 34 years	72 (69.2%)
Gestational age	Less 15 weeks	47 (56.6%)
	16-20 weeks	36 (43.4%
Marital status	Free Union	57 (54.8%)
	Single	23 (22.1%)
	Married	24 (23.1%)
Job	Student	14 (14.3%)
	Housewife	54 (55.1%)
	Others	30 (30.6%)
Instruction	Primary	25 (23.1%)
	Secondary	59 (56.1%)
	Higher	20 (19.2%)

Address	Rural	24 (23%)
	Urban	19 (19%)
	Marginal Urban	61 (58.7%)
Weight Gain		43 (41.3%)
History of Pre-Eclampsia		32 (30.8%)
Proteinuria		5 (4.8%)
Gestations	Primigravity	37 (35.6%)
	Multiparous	67 (64.4%)
Couples	A	79 (76.9%)
	More fingers	25 (23.1%)
Folic acid intake	No	12 (11.5%)
	Preconception	19 (18.3%)
	postconception	73 (70.2%)
Foods rich in cereals and vegetables	no	0
	1-2 times	56 (53.8%)
	Over 3	48 (46.2%)
Foods rich in meat	no	4 (3.8%)
	1-2 times	53 (51%)
	Over 3	47 (45.2%)

This table shows risk factors associated with the development of pre-eclampsia, it is important the marital status, work and the type of food they ate.

Table 3: Relationship of gestational hypertensive disease with evolutionary norms.

Variable		Patients (n = 104)
EHG	Evolutionary norm	90 (86.5%)
	EHG	14 (13.5%)
TYPE EHG	Gestational hypertension	9 (8.7%)
	Mild pre-eclampsia	3 (2.9%)
	Severe pre-eclampsia	2 (1.9%)

We observed that 13.5% of the population presented gestational hypertensive disease, predominating gestational hypertension with 8.7%.

Table 4: Proportion of Gestational Hypertensive Disease by Age Groups.

Pregnancy	<19	20 - 34	> 35
Evolutionary norm	18 (85.7%)	67 (93.1%)	5 (45.5%)
Gestational hypertension	2 (9.5%)	4 (5.6%)	3 (27.3%)
Mild pre-eclampsia	1 (4.8%)	0 (0%)	2 (18.2%)
Severe pre-eclampsia	0 (0.0%)	1 (1.4%)	1 (9.1%)
Total	Twenty-one	72	eleven

It is observed that hypertensive disorders of pregnancy occurred in 13.5%, the most vulnerable group were patients older than 35 years for both gestational hypertensive disease and pre-eclampsia.

Discussion

The incidence of pre-eclampsia in the present was 4.8%, added to all hypertensive disorders of pregnancy reach 13.5% figures similar to those reported at the national level by Pacheco [10] in 2006, who indicates as extreme values 10% for the Cayetano Heredia Hospital and 14% for the Arzobispo Loayza Hospital. It also coincides with those found by other authors [2,3,7] who show the high incidence in adolescent pregnancies. Parity is also related to the development of hypertensive disorders of pregnancy, thus it is known that nulliparity is a risk factor for this type of disorder since patients in their first pregnancy could be susceptible to relatively common homozygous genes [8,9,14].

Durán et al. found that 55% of women with hypertensive disorders of pregnancy were primiparous [15], which is in relation to the study by Vargas-Vera et al. where they observed that primigravids are 27% more susceptible than multiparas [12]. Acosta, Vargas-Vera [8,13] established nulliparity as a risk factor for the disease. Extreme age has also been observed as a risk factor for hypertensive disorders of pregnancy as observed lhe incidence of pre-eclampsia increases in women whose maternal age is less than 19 years or older than 35 years [9].

Dekker et al. states that pregnancy-induced hypertension can be a problem of primipaternity, rather than primigravidity [8,11,13] It would be in relation to our research in that it reports 55% of women over 35 years of age with hypertensive disorders [14]. There is a higher incidence of preeclampsia in women who conceive by intrauterine insemination with washed donor sperm compared to intrauterine insemination with unwashed sperm. This indirectly supports an immune basis for pre-eclampsia. The antigenic factor seems to be located in the sperm instead of the seminal fluid itself, which would explain that 23% of the women in our research were the product of the second or third couple [16].The explanation for nulliparity and multiparity with new spouse pregnancies in the development of pre-eclampsia is explained by Sibay et al. in which it supports several theories, based on the pathophysiology of the disease itself: placental ischemia with endothelial dysfunction, very low-density lipoproteins as an activity that prevents toxicity, up to poor immune adaptation and genetic imprinting, the last two are the ones that could explain the development of the disease in this type of patient [17].

Goulet et al, and Ansari et.al. have reported stressful events for the high-risk obstetric situation [18-20]. There are internal and external events of pregnancy that have traditionally been described, typical of high risk, such as the labor issue; related to the stressful activity suffered by patients at work as a housewife or studying, supported by our research work. It is important to highlight the consumption of folic acid as a protective factor against hypertensive disorders, it causes the levels of homocysteine in the blood to decrease, which are related to the lack of foods rich in folates, which were compensated by the supplementation received. its administration was controlled throughout the pregnancy.

Regarding the pathological-maternal and family history, no patients with relevant family, personal or obstetric history were reported, but these factors have been reported to contribute to the risk of hypertensive disorders of pregnancy, such as those reported by Pascuzzo-Lima et al. who manifested a history of maternal diseases such as asthma increases the risk of pre-eclampsia [21].

Likewise, psychosocial factors are risk factors for this pathology documented by Torres-Laguna et al. that conclude that depression, depressive symptoms, violence and the number of prenatal consultations less than 5 are psychosocial risk factors associated with pre-eclampsia. In our study, no depressive disorders or couple conflicts were reported, and domestic work occurred in 30% of them had jobs of various kinds such as administrative and informal jobs and 14% students, increasing the risk of alterations in pregnancy [22,23].

It has been reported that hypertensive and metabolic disorders affect weight and gestational age at birth, with a significant association between neonatal mortality and chronic arterial hypertension and diabetes [24,25]. In our investigation there was no evidence of gestational diabetes or fatal growth alterations despite a relative increase in maternal weight of 41%.

In a study carried out in Peru in 2019, personal factors were evaluated,

such as single marital status, low level of education and low monthly income with risk factors for pre-eclampsia, which was in relation to our work in which It was shown that our patients had a primary level education of 23% and a secondary level of 54%, and 74% were unmarried or single, which would explain the stress suffered by these women to carry out a pregnancy [26,27].

According to a study carried out in Colombia, they reported that the family history related to arterial hypertension present in 45.1% in mothers and 39.2% in sisters [2], which would be in relation to the data of our study that was found in a 30.8% history of hypertensive disorders; on the probability of inheritance or learning of lifestyles; This condition was observed by other authors [3,28], who found a relationship in observational studies with previous generations.

There are a series of risk factors for pre-eclampsia in some epidemiological studies that make their association questionable [14,29]. Among them it is worth mentioning: sudden changes in the climate, urinary infections during pregnancy, marital status, height, blond or red hair compared to brown and separation of the upper incisors, educational level, residence in cities compared to rural areas; some of them mentioned in the present study.

Many challenges remain regarding the prediction, prevention, and treatment of patients with pre-eclampsia and its perinatal complications. However, the identification of maternal and fetal risk factors highlights the biochemical, immunological and ultrasound prediction studies to initiate treatment at the earliest possible time.

Conclusion

Finally, we can say that hypertensive disorders of pregnancy are a public health problem, particularly pre-eclampsia and eclampsia, as they are considered the second cause of maternal death in the world.

Personal and family history of hypertensive disorders was a relevant risk factor, as well as nutrition, premium parity and change of partner occupied an important place; there are questionable risk factors that were taken into account. Poor prenatal care was not considered a risk factor, since the patients regularly attended the consultation for follow-up.

Acknowledgement

Special acknowledgement to the hospital and its patients who allowed us to carry out this research work, as well as to my students who collaborated in the selection of patients.

Conflicts of interest

There are no conflicts of interest. The source of financing was with its own resources and contribution from CEPEGEN (Center for Genetic and Perinatal Studies).

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