

EDITORIAL

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Clinical achievements with the new definitions of Hypertension and Preeclampsia - Hypertension at high altitude

Logros clínicos con las nuevas definiciones de Hipertensión arterial y Preeclampsia - Hipertensión en la altura

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The current issue of The Peruvian Journal of Gynecology and Obstetrics includes articles of great interest on proposals based on the findings of new high blood pressure figures in the Peruvian Andes, micronutrient intake during pregnancy and lactation, evaluation of the fetal brain, early placental aging, various fetal pathologies diagnosed by means of the valuable ultrasound, comparison between classifications of endometrial hyperplasia, and presentation of clinical cases on antithyroid antibodies during pregnancy, vulvar neoplasms, vaginal vault pathology and evisceration, male breast cancer.

Cardiovascular disease (CVD) and kidney disease are responsible for the majority of deaths worldwide. One of the major risk factors for CVD, stroke, and other circulatory diseases is hypertension. In November 2017, the American Heart Association and the American College of Cardiology modified the definition of hypertension (previously defined as a systolic blood pressure (SBP) of 140 or higher, or a diastolic (DBP) of 90 or higher) to an SBP of 130 or higher and a DBP of 80 or higher⁽¹⁾.

In women, CVD is the leading cause of death worldwide. In 2019, there were approximately 275 million women worldwide with CVD. Ischemic heart disease was the leading cause of CVD death, accounting for 47% of CVD deaths, followed by stroke (36% of CVD deaths). Although the overall prevalence of CVD in women has decreased by 4.3% since 1990, some of the world's most populous countries, such as China (10% increase), Indonesia (7% increase), and India (3% increase), have experienced an increase in CVD. Bolivia, Peru, Colombia, Ecuador and Venezuela would have the lowest prevalence. However, it should be borne in mind that in socially disadvantaged regions, mortality in women is higher than in men, and that arterial hypertension is the risk factor that causes the most years of life to be lost in women, followed by high body mass index and high LDL cholesterol. In addition, there is evidence of increased female-specific CVD risk factors, such as pregnancy disorders, menopause, and gynecological conditions. Women are underrepresented in cardiovascular clinical trials, and the COVID-19 pandemic has demonstrated how women's socioeconomic status and cultural role in society affect their physical and mental health and well-being worldwide⁽²⁾.

With regard to arterial hypertension in Peru, the TORNASOL I and II studies, commissioned by the Peruvian Society of Cardiology in 2005 and 2010, provided information on the incidence of cardiovascular risk factors in Peruvians (arterial hypertension, diabetes, smoking and sed-



entary lifestyle), evaluating more than 14,000 people in each study, of whom more than 6,000 lived in the highlands. In the TORNASOL II study, the prevalence of arterial hypertension had increased from 23.7% (found in TORNASOL I) to 27.3%, and in the highlands from 20.4% to 23.2%. Dr. Luis Segura Vega, who led both studies, has considered that blood pressure values in the Andean region, above 3,000 m.a.s.l., are not exactly the same as those of the coast. This important finding is analyzed in an article published in the present issue of our Journal⁽³⁾. The author proposes that 134/89 mmHg is the limiting pattern of normal systolic and diastolic blood pressure in the adult inhabitant of the Andean altiplano. Later we will see how this finding will affect, in our specialty, the management of pregnant women with hypertension in the Peruvian highlands.

Recently there have been publications on the feared presence of preeclampsia in more than 1 in 10 pregnant women in our country and Latin America. In addition to the complicated pathophysiology of preeclampsia, the form, time and severity of presentation vary according to maternal, paternal and fetal genes, race, geography, social situation and several other intervening factors. Its management seems to have become more complex with the new definition of preeclampsia proposed by the American College of Obstetrics and Gynecology (ACOG), which makes it independent of the presence of proteinuria, but includes, in addition to arterial hypertension, the involvement of the various organs and systems involved⁽⁴⁾. On the other hand, the new definition of arterial hypertension proposed by several American arterial hypertension societies led by the American College of Cardiology and the American Hypertension Association, decreases the figures of arterial hypertension from 140 mmHg of systolic pressure and 90 mmHg of diastolic pressure to 130-139 / 80-89 mmHg, values that currently consider it as Stage I arterial hypertension⁽⁵⁾.

Among others, the International Society for the Study of Hypertension during Pregnancy (ISSHP) has made an assessment of how the new definition of preeclampsia without the requirement of proteinuria affects the mother and her fetus, and has found that it increases the incidence of the diagnosis of preeclampsia, but with a milder phenotype, being uncertain whether it will improve the outcomes of the disease⁽⁶⁾.

In another large study to determine the incidence and performance of the new definition of preeclampsia, 66,964 singleton pregnancies were evaluated from 11 to 14 weeks gestation by clinical history and fetal ultrasound to determine gestational age, rule out malformations, and assess the pulsatility index of the uterine arteries by color Doppler ultrasound. In addition, maternal laboratory tests were obtained and this large number of pregnant women who gave birth in two hospitals in the United Kingdom were closely followed. It was found that the diagnosis of preeclampsia increased by 21% (from 2.8% to 3.4%) with the new ISSHP criteria (*de novo* hypertension with maternal organ damage or uteroplacental insufficiency even without proteinuria) and by 7% (from 2.8% to 3.0%) with the ACOG criteria (hypertension and proteinuria during pregnancy or -in the absence of proteinuria- evidence of renal, hepatic or hematologic dysfunction)⁽⁷⁾. The gestational age at delivery, birth weight percentile, and incidence of a small-for-gestational-age (SGA) neonate in the additional PE cases were similar to those in cases with gestational hypertension and less severe than in cases with preeclampsia according to the above ISSHP and ACOG criteria. The incidence of perinatal death was low. In other words, without changing the definition of the minimum blood pressure levels, the new definition of preeclampsia has made it possible to increase the presence of preeclampsia in a greater number of women - and, we would add, to take an acute medical approach to the possibility of the involvement of multiple organs and systems to which due importance was not given, except belatedly when preeclampsia presented itself in a florid manner.

Personal experience in hospital practice shows that little consideration is given to the increase in blood pressure in pregnant women when the systolic pressure reaches 130 mmHg and/or diastolic pressure 80 or 85 mmHg; these figures are considered by health professionals to be within the normal range. However, when reviewing the sequence of blood pressure of the pregnant woman over time, we observe that quite a few of the pregnant women considered "without hypertension" by the classic definition of 140/90 mmHg, later present preeclampsia of varying severity, affecting the health and life of the mother and fetus(es). This, without considering that many women with preeclampsia and HELLP syndrome do not show hypertension.



If the institutions that care for pregnant women agreed to incorporate the new ACOG and ISSHP designations for preeclampsia - which warn of the possible involvement of various organs and systems of the pregnant woman, and not just the kidney (proteinuria) - as well as adopting the new lower figures for arterial hypertension declared by the American societies, we would have an increase in cases of preeclampsia, and obstetricians would be more attentive to the evolution of the pregnant woman and her fetus during the remainder of her pregnancy.

This would also allow alerting the pregnant woman and her family environment of the importance of maintaining her prenatal control visits, the necessary maternal and ultrasound studies of the fetus and to permanently observe the premonitory signs related to preeclampsia.

Initially, hospitals with a greater number of pregnant women and deliveries should establish the new preeclampsia protocol and, after a certain period of time, compare it with the morbidity and mortality results with the "classic" care of pregnant women. We dare to predict that, possibly, we will save a greater number of mothers and newborns during pregnancy and childbirth, as well as the sequelae in mother and child secondary to this complex endothelial disease.

On the other hand, Segura's article opens new fields to explore - hypertension in women and preeclampsia in the highlands of our *sierra*. Alzamora, in 1938, in a study of 160 pregnancies in La Oroya, Peru, at 3,800 m.a.s.l., had already published that the placenta had a weight 43% higher than normal⁽⁸⁾. Another study in Puno, Peru, at 3,850 m.a.s.l., in 46 normal pregnancies and 46 in Lima at 150 m, the weights of the newborns were similar in both places; however, placental weight and volume were higher in Puno, with a higher placental coefficient at high altitude⁽⁹⁾. In Colombia, evaluating pregnancy and placenta in municipalities at low altitude (≤ 1 500 m.a.s.l.), the mean prevalence of preeclampsia was 0.58%, and for municipalities at high altitude (>1 500 m.a.s.l.), 0.75% (95% CI 0.7-0.8%), a statistically significant difference ($P=0.0000$)⁽¹⁰⁾.

Uterine blood flow and birth weight are thought to be reduced and the risk of preeclampsia increased in high-altitude pregnancies. Previous work has demonstrated marked villous

angiogenesis in high-altitude placentas⁽¹¹⁾. But altitude-associated IUGR susceptibility varies among high-altitude populations in relation to the duration of their high-altitude exposure, with multigenerational residents demonstrating one-third of the drop in birth weight present in the shorter duration resident groups. Natural selection acting on regulatory or hypoxia-inducible factor (HIF)-targeted genes would have enabled maternal vascular adaptation to pregnancy in the long-duration altitude resident groups^(12,13).

It remains in the minds and hands of our younger investigators to study the possible consequences of the new definitions of arterial hypertension and preeclampsia in the woman and her child, and their application at high altitude.

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