REVIEW

Impact of Preeclampsia on Public Health and Its Comprehensive Management

Impacto de la Preeclampsia en la Salud Pública y su Abordaje Integral

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ABSTRACT

Introduction: Preeclampsia was recognized as a public health issue due to the increase in cases over the past decades. According to the World Health Organization, it affected 10 million women during pregnancy each year, causing 76,000 maternal deaths and 500,000 neonatal deaths related to hypertensive disorders. In Latin America, a quarter of maternal deaths were linked to these complications, with women in developing countries being the most vulnerable. In Peru, preeclampsia represented the second leading cause of maternal death, with hospital prevalence rates ranging between 10% and 14.2%.

Development: Preeclampsia affected both the mother and the fetus, requiring continuous care to prevent complications. It emerged from the 20th week of pregnancy until the 30th day postpartum, presenting with hypertension, proteinuria, and occasionally edema. Its classifications included mild and severe preeclampsia, differentiated by symptom severity. The pathophysiology involved placental dysfunction and damage to target organs such as the brain, kidneys, and liver. Among the most severe complications were eclampsia and HELLP syndrome, which increased maternal and fetal morbidity and mortality. Dorothea Orem's self-care theory highlighted the importance of educating pregnant women about preventive practices, such as prenatal care and monitoring risk factors.

Conclusions: Preeclampsia proved to be a complex and potentially fatal condition. Addressing it required comprehensive actions focused on prevention, education, and clinical management. In Peru, strengthening prenatal care programs and ensuring access to specialized services was essential to improve maternal-fetal health outcomes.

Keywords: Preeclampsia; HELLP Syndrome; Public Health; Maternal Morbidity and Mortality; Self-Care.

RESUMEN

Introducción: La preeclampsia fue reconocida como un problema de salud pública debido al aumento de casos en las últimas décadas. Según la Organización Mundial de la Salud, cada año afectó a 10 millones de mujeres durante la gestación, provocando 76 mil muertes maternas y 500 mil neonatales relacionadas con trastornos hipertensivos. En América Latina, la cuarta parte de las muertes maternas estuvieron vinculadas a estas complicaciones, siendo las mujeres en países en desarrollo las más vulnerables. En Perú, la preeclampsia representó la segunda causa de muerte materna, con prevalencias hospitalarias entre 10% y 14.2%.
Desarrollo: La preeclampsia afectó tanto a la madre como al feto, requiriendo cuidados continuos para prevenir complicaciones. Emergió desde la semana 20 del embarazo hasta el día 30 posparto, manifestándose por hipertensión, proteinuria y, ocasionalmente, edema. Sus clasificaciones incluyeron preeclampsia leve y severa, diferenciadas por la gravedad de los síntomas. La fisiopatología implicó disfunción placentaria y daño a órganos diana como cerebro, riñones e hígado. Entre las complicaciones más graves destacaron la eclampsia y el síndrome de HELLP, que aumentaron la morbimortalidad materno-fetal. La teoría de autocuidado de Dorothea Orem resaltó la importancia de educar a las gestantes sobre prácticas preventivas, como el control prenatal y el monitoreo de factores de riesgo.
Conclusiones: La preeclampsia demostró ser una condición compleja y potencialmente mortal. Abordarla requirió acciones integrales enfocadas en prevención, educación y manejo clínico. En Perú, fortalecer los programas de control prenatal y garantizar el acceso a servicios especializados fue fundamental para mejorar los resultados en salud materno-fetal.

Palabras clave: Preeclampsia; Síndrome de HELLP; Salud pública; Morbimortalidad materna; Autocuidado.

INTRODUCTION

Currently, preeclampsia is considered a public health problem due to the increasing number of cases in recent decades. According to the World Health Organization [WHO], preeclampsia occurs in ten million women around the world every year during pregnancy. Worldwide reports tell us that 76,000 pregnant women die from preeclampsia and related hypertensive disorders, as well as from their complications. The number of newborns who die each year from these disorders is believed to be 500,000. It should be emphasized that in Latin America, a quarter of maternal deaths are related to these types of complications (Rojas Pérez et al., 2019).

In developing countries, a woman is seven times more likely to develop preeclampsia than those living in a developed country and end up in maternal death from 10 to 25% of probable cases (Pereira Calvo et al., 2020).

In Peru, preeclampsia is the second leading cause of maternal death, accounting for 17 to 21% of deaths. Prevalence in Lima hospitals fluctuates between 14.2% and 10%. Mild to severe hypertensive disorders have been found in 4.8%, 5.36%, 6.6%, and up to 7.31% of pregnant women who go to hospitals (Velumani et al., 2021).

DEVELOPMENT

Preeclampsia

Preeclampsia currently represents a public health problem. Due to the increase in cases that is evident in maternal deaths, it has come to occupy second place in Peru. As it is a public health problem that affects both the mother and the fetus, permanent care is needed to avoid obstacles in the future. A vital basis for preventing or controlling preeclampsia is the capacity for self-care that each pregnant woman

must put into practice. The goal is for each pregnancy and birth to end satisfactorily for the mother and child. (Guevara Ríos, 2019)

Preeclampsia is a disease peculiar to human pregnancy. It emerges from the twentieth week and even on the 30th postpartum day and can be determined by the appearance of high blood pressure and proteinuria. Preeclampsia is also associated with edema, although it is not essential for diagnosing the pathology (Velumani et al., 2021).

Classification of preeclampsia

In pregnant women, this disease can become complicated and develop into eclampsia, help syndrome, or even cerebral hemorrhage. In mild preeclampsia, blood pressure is at values from 140/90 mmHg or has been reflected in a rise of 30 mmHg in systolic blood pressure and 15 mmHg in diastolic blood pressure. Protein in urine is more than 300 mg in 24 hours, and there is no vasospasm (contraction of the blood vessels) (Laveriano et al., 2015).

Severe preeclampsia is characterized by the same triad as mild preeclampsia, but in this case, the blood pressure is 160/110 mmHg or higher, proteinuria is greater than 5 grams in 24 hours, and edema, headache, tinnitus, and phosphenes are present (Velumani et al., 2021).

Pathophysiology

The pathophysiology of preeclampsia involves maternal, placental, and fetal factors, which determine two fundamental pathophysiological alterations: an abnormal trophoblast invasion and a secondary endothelial dysfunction, which explains the microangiopathy produced in preeclampsia, with the latent risk of damage to target organs such as the heart, brain, kidney, liver, placenta and hematological system. The early alterations that occur in the growth of the placental vessels give rise to a relative hypo perfusion of the placenta, followed by hypoxia and ischemia, which produces the release of anti-angiogenic factors into the maternal circulation, producing systemic endothelial dysfunction, which causes hypertension and the clinical manifestations of preeclampsia and its complications (Vasquez, 2018).

In a physiological pregnancy, cytotrophoblast cells migrate through the decidua and invade the mother's spiral arteries, as far as the inner third of the myometrium, to initially replace the endothelial cells and then destroy the muscular layer of the tunica media of these vessels, which are the terminal branches of the uterine artery, responsible for perfusing the placenta and fetus. The transformation of these arterioles begins at the end of the first trimester and is completed between 18 and 20 weeks of pregnancy. The changes that occur in the spiral, muscular and small diameter arteries, to larger caliber vessels with a reduction in their muscular layer, allow for the creation of a low resistance, high capacitance uteroplacental circulation to facilitate blood flow to the placenta and allow for the release of vasodilator substances that act locally and systemically (Peraçoli et al., 2019).

Clinical manifestations

The symptoms of preeclampsia are hypertension (increased blood pressure), proteinuria (protein in the urine), edema (fluid retention), excessive weight gain, nausea, vomiting, epigastralgia (pain in the epigastric region), headache, blurred vision, hyperreflexia (stimulation of the osteotendinous reflexes), increased pulse, even mental confusion in more severe cases and constant anxiety (Calle Criollo & Cárdenas Heredia, 2023).

Risk factors for preeclampsia

In contrast to maternal factors, we find in cases of the conception of maternal age under 20 and over 35, black race, previous pregnancies with preeclampsia, presence of some chronic diseases of the mother such as arterial hypertension, obesity, diabetes mellitus, insulin resistance, kidney disease, neurofibromatosis, antiphospholipid syndrome, and dyslipidemia (Orellana, 2020).

There are also those related to the pregnancy itself in the case of a first pregnancy or as in the case of pregnancies with a new sexual partner, as well as uterine distension due to twin pregnancy or polyhydramnios, or molar pregnancy in nulliparous women, while environmental factors include malnutrition due to deficiency or excess, due to low calcium intake before and during pregnancy,

hypomagnesemia and deficiencies of zinc and selenium, as well as cases of alcoholism during pregnancy (Aguirre Lipa, 2017).

Hypertensive complications in pregnant women

Eclampsia.

Eclampsia is one of the most frequent complications, referring to seizures similar to an epileptic fit that appear in the context of preeclampsia and hyperreflexia. They are life-threatening and can occur before, during, or after childbirth (Velumani et al., 2021).

Hellp syndrome.

Help syndrome, known by its initials SH, is a severe complication of pregnancy characterized by hemolysis, elevated liver enzymes, and thrombocytopenia. Many authors conclude that it is one of the most serious complications of pregnancy, causing high rates of maternal and perinatal morbidity and mortality. The most frequent complication in a patient with Hellp syndrome is hemorrhage, with blood transfusion or blood products becoming key to correct hypovolemia, anemia, or coagulopathy, the most catastrophic complication being spontaneous hepatic hematoma (Zapata Díaz & Ramírez Cabrera, 2020).

Dorothea Orem's model applied to pregnant women: Self-care.

In this regard, Vera (2016) argues that self-care is an active phenomenon. The knowledge and the collection of skills of each individual determine this preconceived and intentional action. Dorothea Orem argues that the capacity for self-care is not innate; on the contrary, it is influenced by the beliefs, habits, and practices the person maintains by the social group to which they belong. In this case, the capacity for self-care is related to specific requirements, the purpose of which is to promote the conditions necessary for life and the prevention of adverse conditions or to alleviate them. This theorist proposes three requirements:

The first is the universal requirements, which represent the basic behaviors for developing each life cycle. Pregnancy is a natural physiological state of changes and modifications of the organism that each woman undergoes during the course of gestation until its end. However, during gestation, both the mother and the fetus are exposed to different risk elements. If the mother does not take good care of herself during her pregnancy, preeclampsia can occur, causing significant damage to the mother-fetus binomial (Naranjo Hernández et al., 2017).

The second is addressed by the requirements of development, which are the conditions that guarantee growth and development in specific life cycle situations. As pregnancy is synonymous with reproduction, it is where the pregnant woman must take good care of herself so that preeclampsia is not generated and affects her life and that of the new being. She manages to preserve good Health (Meza et al., 2021).

The third is the requirements derived from the deviation of Health, which encompasses the necessary behaviors for sick, injured, or disabled people. During pregnancy, women experience various changes and modifications that require self-care needs and, on occasion, self-care deficits that must be restored to maintain or preserve good Health. For this reason, pregnant women must be influenced and instructed to carry out self-care actions, including prenatal nutrition, blood pressure monitoring, and other actions that avoid the risk factors for preeclampsia (Naranjo Hernández et al., 2017).

CONCLUSIONS

Preeclampsia is an obstetric condition that persists as a global public health problem, significantly affecting both the mother and the fetus. According to the evidence reviewed, millions of women face this disorder during pregnancy every year, and its complications contribute significantly to maternal and fetal morbidity and mortality rates. In developing countries such as Peru, the incidence and mortality rates are even higher due to factors such as limited access to health services, socioeconomic inequalities, and the lack of specialized resources.

In Peru, preeclampsia is the second leading cause of maternal death, accounting for between 17% and 21% of cases. The prevalences found in various hospitals reflect a significant range from mild to severe

hypertension, highlighting the urgent need for effective interventions. The pathophysiology of preeclampsia and its clinical manifestations, such as hypertension, proteinuria, and edema, underline the complexity of this condition, which affects multiple body systems and requires a multidisciplinary approach for its management.

Among the most severe complications are eclampsia and HELLP syndrome, both of which have potentially lethal consequences if not identified and treated promptly. These findings reinforce the importance of adequate monitoring during pregnancy and preventive strategies based on promoting self-care by pregnant women. Dorothea Orem's theoretical model highlights the relevance of self-care as a key component in preventing and managing preeclampsia, emphasizing the need to educate pregnant women about healthy practices that reduce risk factors.

In conclusion, addressing preeclampsia requires a combination of preventive, educational, and therapeutic actions that guarantee the well-being of the mother-fetus binomial. It is essential to strengthen prenatal control programs, train health personnel, and guarantee equitable access to specialized services, especially in vulnerable contexts. Only through these comprehensive efforts will it be possible to reduce the burden of this condition and improve maternal-fetal health outcomes.

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