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## Crítica de Libros/Book Review

## Programación fetal: ambiente de crecimiento y desarrollo prenatal, de Rafael A. Caparrós González. Ediciones Pirámide, 231 pp., año 2019

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The intrauterine universe has traditionally been considered an isolated space, impassive from the outside world. In the past, the fetus was believed to grow in the womb regardless of what was happening outside. Later, this protection was shown to be partial. During the 9 months of gestation, the environment that surrounds pregnant women affect the fetus and her/his later life.

Fetal programming is a relatively new concept. Since 2008, publications about this topic have increased exponentially, reaching almost 70,000 registers in the last 10 years. This increase comes from the importance of studying intrauterine environment influence on fetal well-being and its relationship to numerous health problems throughout life.

Large cohorts and records studying an exposure to extreme starvation, such as the Netherlands or Leningrad siege during World War II, supports the hypothesis of fetal origins of adult disease. It was shown how the exposure to malnutrition in those pregnant women was related to the appearance of diseases in the offspring regardless of individual lifestyle. This fact shows that the human body remains programmed from the perinatal period despite healthy habits.

Furthermore, the relationship between low birth weight and development of cardiovascular diseases upholds the fetal programming hypothesis. Subsequent projects confirmed its relationship with other disorders in the postnatal stage, such as the metabolic syndrome, insulin resistance, or diabetes. So, our body is designed to be adapted to the environment, especially in the early stages of development, though sometimes they do not improve the chances of survival, but the opposite of it.

The book *Fetal programming: Prenatal growth and developmental environment* [Programación fetal: ambiente de crecimiento y desarrollo prenatal] synthesizes all the available evidence on prenatal environment and consequences on postnatal health in the short and long term.

As cited in this book, pregnancy is a stage characterized by the continuous interaction between mother and fetus, in which genetic, environmental, and behavioral factors can determine the present and the future health of the mother and the newborn. In this way, fetal

stages determine postnatal life's health. Exposure to environmental factors, such as stress, anxiety, violence, pollution or communicable diseases, has been shown to induce epigenetic modifications that will be transmitted to the offspring and future generations.

Among other topics, this book addresses assisted reproduction techniques, which have increased due to conception difficulties given the social transformations in the last decades. This book discusses possible obstetric complications related with their use.

Another important topic addressed by this book is the influence of a mother's lifestyle on fetal and postnatal health. A mother's diet quality and her physical activity are modifiable factors that have been largely studied, which are described in this book. But this publication reports certain behavioral habits that have been less explored and also determine mother's and newborn's health.

On the other hand, highly prevalent pathologies, such as preeclampsia, gestational diabetes, or anemia, are also widely described in the book, given their high prevalence and their impact on pregnancy.

Something to highlight is the multidisciplinary authorship of this book, which I consider a positive aspect. Researchers from different fields (psychology, medicine, sociology, physiology, anthropology, midwifery, and nursing) and institutions have made their contribution to this book, addressing fetal programming from many perspectives, describing it in all its aspects.

The first chapter introduces the fetal programming concept. The second chapter addresses the importance of fetal programming for the development of the metabolic syndrome in adulthood. From third to sixth chapter the relationship between exposure to stressors and psychological alterations during pregnancy and the development of diseases from the prenatal stage to childhood and adulthood are discussed. The seventh chapter describes the physiology of the predisposition to certain diseases determined by the quality of the diet during pregnancy. The eighth chapter reveals the importance of preeclampsia in future obesity development, diabetes, cardiovascular diseases, metabolic syndrome, and other chronic non-communicable diseases in the adulthood. The ninth chapter focuses on short

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and long term consequences of assisted reproductive techniques. Chapter ten deals with the relationship between intimate partner violence during pregnancy and its serious consequences on the offspring in the postnatal stage and the adolescence. In chapter eleven, GESTAFIT (GESTation and FITness) project results are shown, describing the relationship between physical condition and physical exercise and physiological, social, and genetic markers of pregnant women and the newborn. Chapter twelve and thirteen tell us about

neurodevelopmental and psychopathology disorders as a result of exposure to environmental pollutants, which in many cases is preventable.

The last chapter is dedicated to how viral epidemics and pandemics have influenced prenatal and postnatal health. It addresses how situations such as the one that we are experiencing nowadays due to the COVID-19 pandemic can determine the health of future generations.