

Hypertensive Disorders in Pregnancy (1978), by Leon Chesley

Leon Chesley published *Hypertensive Disorders in Pregnancy* in 1978 to outline major and common complications that occur during pregnancy and manifest in abnormally high blood pressures in pregnant women. The book was published by Appleton-Century-Crofts in New York, New York. Chesley compiled his book as a tool for practicing obstetricians and teachers. The book focuses on preeclampsia and eclampsia, but it also describes other common and rare hypertensive diseases and disorders of pregnancy and discusses their histories, diagnoses, management plans, pathologies, and immediate and remote prognoses for mothers and fetuses. Doctors used the book and all subsequent editions to help diagnose and manage complications during pregnancy and to avoid deaths for pregnant women and fetuses.

In *Hypertensive Disorders in Pregnancy*, Chesley compiled 40 years of his and others' research on hypertensive disorders. Chesley worked as a researcher and associate professor in obstetrics and gynecology at the State University of New York Downstate Medical Center in Brooklyn, New York. The first edition of the book written included a foreword by Chesley's colleague, Ralph Wynn from The Abraham Lincoln School of Medicine at the University of Illinois in Chicago, Illinois.

In his preface Chesley states that he wrote his book to counter the high mortality rates due to hypertensive disorders in pregnancy. Chesley argued that those deaths were largely preventable, and that early detection and proper management would help pregnant women and their fetuses. The book has eighteen chapters.

The first chapter, titled "Orientation," is a basic framework about what Chesley discusses in later chapters. Chesley notes that doctors struggled to conceptualize hypertensive diseases because they are often named toxemias. Chesley states that toxemia, a term that doctors used interchangeably with the term preeclampsia, is an outdated misnomer because the symptoms of most hypertensive diseases do not result directly from toxins. Chesley states that around six percent of all pregnant women have high blood pressure complications during pregnancy, and he acknowledges that the number varies due to geographic, racial, and socioeconomic factors. The chapter defines different types of hypertensive disorders such as diseases peculiar to pregnancy (preeclampsia and eclampsia), diseases independent of pregnancy (chronic hypertension), preeclampsia or eclampsia superimposed upon chronic hypertension, transient hypertension, and unclassified hypertensive disorders. The book focuses more on preeclampsia and eclampsia, and less on the remaining types of hypertensive disorders.

In "Orientation," Chesley explains that preeclampsia is an acute hypertensive disorder found most often in women experiencing their first pregnancies, and that doctors often diagnosed it after the twentieth week of gestation in women. Additionally, preeclampsia leads to eclampsia if it is not properly managed or detected in pregnant women. In addition, Chesley discusses the symptoms of severe preeclampsia, which include high blood pressure and protein in the urine, low urinary volume, cerebral or visual disturbances, fluid in the lungs (pulmonary edema), or the presence of a bluish tint to the skin (cyanosis) due to poor circulation.

According to Chesley, in 1978, doctors often misdiagnosed preeclampsia, and that they confirmed those diagnoses by the presence of lesions in the kidneys seen in imaging or biopsies. Chesley explains that, although protein in the urine is often a tool used to diagnose preeclampsia, it results from many diseases and syndromes. Chesley calls attention to the need for clearer diagnostic guidelines.

Chapter two of Chesley's work is a history on preeclampsia and eclampsia. The author describes their symptoms, which include convulsions. Those symptoms were mentioned in literature from the ancient Egyptians, Chinese, Indian, and Greek societies. Chesley hypothesized that eclampsia had fewer references in ancient works because it was not differentiated from epilepsy until later in history. The chapter also states that midwives typically handled issues of pregnancy and birth, so fewer written material was available for reproductive medicine since males traditionally were the ones publishing written works. According to Chesley, Francois Boissier de Sauvages introduced the word eclampsia in 1739 France in *Pathologia Methodica* (Methods in Pathology), in which he differentiated eclampsia from epilepsy. The chapter credits various scientists and researchers with being the first to use specific diagnostics and associate them with preeclampsia and eclampsia such as protein in the urine, swelling, and high blood pressure. The history of the disease is also marked with treatments including bloodletting and experimental procedures and surgeries that often forcibly delivered fetuses, often causing more harm than good in women. The historical chapter concludes that hypertensive disorders in pregnancy were given specific classifications in 1940 by the American Committee on Maternal Welfare.

Chapter three discusses some of the most common predisposing factors for a pregnant woman to develop preeclampsia. Among the factors that Chesley attributes to preeclampsia include familial history to preeclampsia-eclampsia, diabetes, being pregnant with multiple fetuses, and never having before been pregnant. Other factors included extremes in age, preexisting hypertensive vascular or kidney related diseases, or other rare conditions such as the presence of a hydatidiform mole, a rare growth that forms inside the womb at the beginning of a pregnancy, or fetal hydrops, another rare complication linked to the abnormal accumulation of fluid in fetal compartments. The chapter notes that a woman can have preeclampsia-eclampsia even if none of the predisposing factors are met. Chesley discusses other hypotheses that researchers had proposed as caused of preeclampsia, such as illegitimate pregnancies, socioeconomic status, city compared to countryside pregnancies, and weather. The chapter conveys that preeclampsia can originate from a number of different predisposing factors, and that no one singular factor has been seen in all diagnoses.

Chapter four, titled "Structural Lesions," discusses how preeclampsia and eclampsia affected the bodies of pregnant women, results established from postmortem examinations of women who died during childbirth. Preeclampsia and eclampsia affect the kidneys because those organs filter the blood and are vulnerable to abnormal blood pressures. Continued high pressure causes the kidneys to less effectively filter proteins and other large molecules out of the small capillaries that collect urine. Lesions that cause the kidneys to malfunction can accumulate and result in near or total occlusion of the capillaries in the kidney. The degree of damage associated with kidney damage can vary from in nine grades, from slight lesions to death of the outer portion of the kidneys (gross cortical necrosis) due to blockage of arteries that circulate blood within the kidneys. Preeclampsia-eclampsia also can damage, the lungs, the heart, the spleen, and the brain, causing convulsions and comas.

In chapter five, "Disseminated Intravascular Coagulation," Chesley discusses how eclampsia affects how blood clots in pregnant women. Eclamptic women exhibit higher rates of blood clotting than non-eclamptic women. Additionally, Chesley describes abruption placentae, a premature separation of the placenta from the uterus. He states that abruption placentae occurs at a higher rate in women with preeclampsia-eclampsia, and that some of those cases are connected to defects in blood clotting. Chesley notes that not all cases of preeclampsia-eclampsia cause abnormal blood clotting.

In chapter six, "Blood Pressure and Circulation," Chesley discusses blood flow and blood pressure in pregnant women. The author describes preeclamptic women as being more sensitive to three hormones that control blood pressure responses, including vasopressin, norepinephrine, and angiotensin. Pregnant women with hypertension but not preeclampsia only show small increase of blood pressure in response to those hormones.

In chapter seven, "The Kidney," Chesley highlights the role of the kidney in hypertensive diseases, because kidneys filter blood. Chesley notes that doctors diagnose pre-eclampsia by checking for proteins in the urine of pregnant women. Chesley says that protein in the urine for pregnant women with preeclampsia does not usually manifest until late in the course of the disease, and that some

eclamptic women deliver their babies without that symptom. Chesley also elaborates that the amounts of protein in the urine can fluctuate in pregnant women from hour to hour, making it a variable metric for diagnosis.

In chapter eight, "Fluids and Electrolytes," Chesley describes the abnormally large retention of salt, or sodium, in preeclamptic pregnant women. The retention of sodium manifests as swelling, or edema, a very common symptom of the disorder. In chapter nine, "Renin, Angiotensin, and Aldosterone," Chesley discusses the three hormones that are responsible for the raise blood pressure in all humans.

In chapter ten, "The Liver," Chesley discusses the liver in relation to hypertensive disorders. Lesions on the liver occur as a result of preeclampsia and Chesley describes the tests for liver functioning. He states that many of the tests used to diagnose preeclampsia failed for that purpose.

In the final chapters of the book Chesley discusses the implications of preeclampsia for pregnant women and fetuses. Chapters eleven through fourteen discuss the management of the disorder. In chapter fifteen, "Assessment of the Fetal Status," Chesley shifts focus away from the pregnant woman to the fetus. Chesley says that as maternal mortality due to the disorder dropped in the previous decades, physicians worked to improve the physical and mental development fetuses.

In chapter sixteen, "Remote Prognosis," Chesley describes the prognosis of preeclampsia, details the typical course of the disorder in pregnant women, and discusses the potential long-term effects on women. In chapter seventeen, titled, "Hypothesis," he describes some hypotheses that scientists and researchers proposed as the cause of preeclampsia. Some hypotheses proposed immunologic factors, renal or kidney factors, or specific placental factors. The final chapter, "Hypertensive and Renal Diseases," discusses other diseases not related to preeclampsia or eclampsia that occur in pregnant women, but that are due to preexisting hypertension in women or relate to other diseases like diabetes.

Chesley's *Hypertensive Disorders in Pregnancy* became a standard reference in the fields of obstetrics and gynecology after its publication in 1978. In 1999, one year before Chesley died, Chesley's colleagues compiled a second edition of the book. Each subsequent edition of the text compiled scientific information on hypertensive disorders and diseases that women face during pregnancy. The text continued to influence reproductive medicine with further editions. A third edition was published in 2009, and the book's fourth edition was published in 2014.

Sources

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