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Introduction: Current Preterm Birth Prevention Strategies

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Introduction

Preterm birth (PTB), defined as delivery before 37 completed weeks of gestation, remains a significant problem in Obstetrics as it is the leading cause of morbidity and mortality in infants without major structural anomalies. Despite extensive research, our field has not been able to significantly and permanently decrease the rate of PTB in the US since the 1980s. The etiology of PTB likely involves extremely complex interactions between numerous factors including but not limited to genetics, hormones, the immune system, reproductive tissue properties (uterus, cervix, fetal membranes, placenta), vascular system, nervous system, maternal anatomy (geometric factors), our microbiome and the environment. Since PTB is an extremely complex, multifaceted problem, solving the dilemma of PTB will require a diverse, multi-disciplinary approach. Given the vast and constantly growing amount of research in this area, we are excited to announce that *Seminars and Perinatology* has dedicated two consecutive issues to this topic in a series entitled, “Current Preterm Birth Prevention Strategies”. In this two-part edition, our goal was to have a diverse group of international experts from pertinent fields provide the most up-to-date knowledge from the cutting-edge research that focuses on the etiologies of PTB as well as the current and novel interventions that show promise in decreasing the rate of prematurity.

In the first issue of this exciting two-part edition, the focus will be on discussing the various complex etiologies of PTB with particular interest on the different “compartments” (ie genetics, microbiome, uterus, fetal membranes and cervix) that are involved in the pathways to PTB. Drs Stephanie Purisch and Cynthia Gyamfi-Bannerman will discuss the recent epidemiologic trends that we are seeing in cases of medically-indicated and spontaneous PTB. Lindsay Parnell, Catherine Briggs and Dr. Indira Mysorekar provide an excellent overview of research looking at the relationship between our microbiome and PTB. Drs

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Kara Rood and Catalin Buhimschi review our current understanding of the intricate genetic and hormonal etiologies of PTB. Dr. Ramkumar Menon and Lauren Richardson provide a compelling and in-depth view of how and why fetal membranes rupture prematurely leading to spontaneous PTB. Drs Asha Talati, David Hackney and Sam Mesiano provide a novel and exciting understanding of how the uterus activates prematurely leading to preterm labor with intact fetal membranes. Drs Joy Vink and Mirella Mourad present our current understanding of the pathophysiology involved in premature cervical remodeling with a specific focus on human pregnancies. They also provide a paradigm-shifting model of cervical tissue architecture which will dramatically change our view of cervical function in pregnancy. Dr. Cynthia Gyamfi-Bannerman will conclude the first issue with current thoughts and opinions from the recent annual Preterm Birth International Collaborative (PREBIC) Meeting in Galveston, Texas.

In our second issue, esteemed experts in the field of PTB will first focus on current screening, prevention and intervention strategies to decrease the rate of PTB. Specifically, Drs Emily Miller and Moen Son review current screening options for women at risk of PTB. Dr. Vincenzo Berghella and Rupsa Boelig discuss current options for mechanical prevention of PTB. Dr. Tracy Manuck provides a comprehensive discussion on the role of progesterone in preventing PTB. Drs Isabelle Dehaene, Lina Bergman, Paula Turtiainen, Ben Mol and co-authors Alexandra Ridout and Elsa Lorthe review current rationales for and against tocolysis to prevent PTB. Next, the second issue will change direction from the past and present to focusing on the future. Dr. Feltovich and Lindsey Drehfal present the future of imaging tools that may redefine how we assess a woman's risk for PTB. Andrea Westervelt and Dr. Myers present an exciting new concept of using computer simulation models as tools to better predict a woman's risk of PTB and identify which patients will benefit from current and future interventions. Drs Myers and House present compelling and novel research on ways to strengthen the cervix to prevent premature cervical remodeling and PTB. Lastly, as we move forward on our march to decreasing the rate of PTB, Dr. Manuck will present vital data regarding health disparities that need to be considered when studying PTB and Dr. Norman will discuss the importance of evaluating long-term neonatal outcomes.

We would like extend our sincerest thanks to the contributors who graciously devoted their time and expertise to make this series in Seminars in Perinatology possible. We would also like to acknowledge and thank the production department and our publisher for understanding the enormity of the problem of PTB and allowing us to create this two-part edition. We sincerely hope that the information provided in these chapters inspire and remind the clinicians who manage these challenging cases on the frontlines and the researchers who are hard at work in the lab or performing clinical trials that your efforts and work are vital to solving this perplexing problem of PTB.

Biography

Cynthia Gyamfi-Bannerman, MD, MSc, Co-Director

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