

Pregnancy is a State of Balance Between Opposing and Interactive Inhibitory and Stimulatory Systems Secondary to Exponential Uterine Wall Tension and Laplace's Law: A Hypothesis II

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Abstract

Objective: Labor is viewed as the result of a physiologic release from an inhibitory effect of pregnancy on the myometrium, rather than an active process mediated by contractile agonists. The contractile stimulators and relaxation mechanisms have not yet been well defined. The objective of the study is to identify the systems that control uterine function during pregnancy. Design: Research Study Setting: Portiuncula University Hospital, Ireland Population: N/A Methods: This study investigated the current evidence-based literature that may support the hypothesis, accompanied by a 40-second 3D animation. Main Outcome Measures: N/A Results: Uterine mechanotransduction has functional and molecular components, wherein the exponential uterine wall tension (EUWT) is the functional component, and the intrinsic myometrial cell character (IMCC) is the molecular component. IMCC enables the uterus to control its functions both autonomically and intrinsically, secondary to changes in tension. EUWT is measured by Laplace's Law and is created and maintained by interaction among the gestational sac, uterus, and cervix, for which the primary function is to maintain the EUWT. Directly, EUWT mechanotransduction and progesterone/estrogen stimulation induce the inhibitory system and indirectly, they induce the stimulatory system by inducing myometrial hyperplasia and hypertrophy. The inhibitory system is the main system that maintains pregnancy through a stretch-dependent mechanism. The stimulatory system makes the cervix lose its strength through the YVU pattern formation by transforming it into the lower uterine segment, thus terminating the pregnancy. Conclusion: There is evidence-based support for the hypothesis which might be the first step in uncovering the human parturition's mystery.

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