

Nocturnal Synchronization and Synergy of Interactive Inhibitory and Stimulatory Systems Secondary to Light Dark Cycle Modulation Dictates Timing of Birth and Pregnancy Duration: A Hypothesis III

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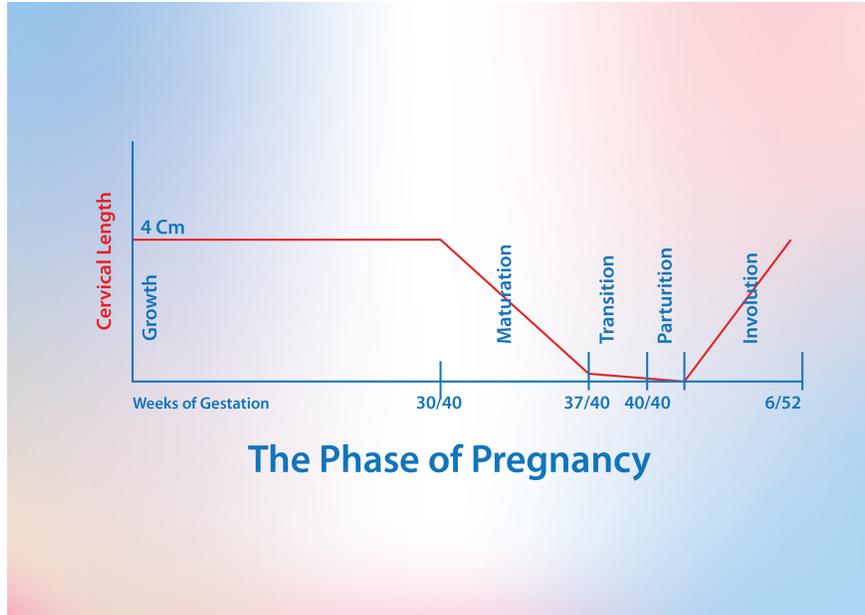
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Abstract

Objective: The clock that measures the duration of pregnancy consists of two interacting timers: an interval timer measuring the overall length of gestation, and a circadian timer defining when within a 24-hour cycle birth occurs, and they have not been definitively established or systematically studied and our objectives to study pregnancy interval and circadian timers. **Design:** Research Study **Setting:** Portiuncula University Hospital, Ireland **Population:** N/A **Methods:** This study investigated the current evidence-based literature and research that may support our proposed hypothesis, accompanied by a 40-second 3D animation. **Main Outcome Measures:** N/A **Results:** Gestation is divided into five clinical phases, growth, maturation, transition, parturition, and involution secondary to light-dark cycle modulation of the interactive inhibitory and stimulatory systems. During the maturation phase (30-37 weeks), the inhibitory system transiently wears off due to cortisol modulation. This occurs alongside the modulation of melatonin and oxytocin, and the latter induces contractions of the stimulatory system, resulting in nocturnal synchronization and synergy of the two systems and causing the cervix to lose its strength by transforming it into the lower uterine segment. Pregnancy interval and circadian timers are achieved by a single mechanism, that is, exponential uterine wall tension (EUWT) failure, secondary to the complete loss of cervical resistance nocturnally. **Conclusion:** The creation, autonomic maintenance, and eventually autonomic termination of the EUWT make gestation an autonomic cycle with constant intervals and circadian timers. There is evidence-based support for the hypothesis which will have an impact on obstetric practice and maternal and family welfare.

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