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# Optimizing Gestation and Early Life Physiology through Timing of Energy Turnover: Bioprocessing of Human Life

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The objective of this perspective article was to describe a novel pragmatic ideology on optimizing pregnancy metabolism and growing child endocrinology and health through timing of energy intake. Energy herein is defined as any substrate that directly or indirectly contributes to fuelling pregnancy progression and growing child development of brain and non-brain cells. Timing of energetic is characterized by adopting optimal circadian occasions (e.g., over an almost 24-h period) for energy-yielding foods and fruits consumption.

Evidence suggests that human develops nocturnal insulin resistance [1,2]. The overnight glucose intolerance stems from the evolutionary fact that human is a diurnal creature being active during day and resting overnight. As such, endocrinology and intermediary metabolism have evolved to be activated during day and especially in morning when cells anticipate increased metabolic activity [3,4]. Thus, energetic timing will determine how effectively the body can manage the ingested energies in different amounts and forms. Ruminant animal models data indicated that morning versus evening feed delivery once daily significantly alters circadian rhythms of nutrient intake and metabolism as well as nutrient partitioning [5-9]. Such an effect would be of great public health importance in pregnant woman and the resulting child growth and development efficiency.

Pregnancy especially in later stages is known for high development risks of metabolic disorders such as insulin resistance, diabetes, splanchnic and abdominal adiposity and fatty liver [9,10]. Disciplined food regimes and appropriate exercise are increasingly being emphasized to prevent such problems and likely to improve foetal and child metabolism and health [10-12]. Timing of energetic through optimizing timing of energy intake can accomplish a great deal of success in managing pregnancy metabolism and health. Accompanied by regular physical activity, optimal timing of energy-yielding nutrients intake helps improve the maternal metabolism that is already complicated with the growing foetus physiology and thus the altered nervous and hepatic cell omical properties. Due to the high risk of insulin resistance overnight, large nocturnal food meals and even considerable energy-dense fruits consumption can induce and augment the factors contributing to central obesity and diabetes mellitus development in pregnant women. Such an abnormal maternal metabolism would in many ways impair normal foetal health [13]. This abnormality is subsequently extendable to child development post-birth. Altered foetal genomics, proteomics and metabolomics could, thus, build pathologic foundations for a forthcoming entity as a child, adult and public.

To sum, pregnancy health and metabolism is highly related to the health and wellbeing of the child, adult and public as a whole. Optimizing the timing of energtics through optimal times of energy consumption over the almost 24-h circadian periods during pregnancy and child growth is a feasible, pragmatic, global and lifetime ideology towards bioprocessing and constructing quality public health.

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