Perspective Article

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Social health betterment via optimizing embryonic and foetal omics: an obesity perspective

Abstract

This article develops a pragmatic approach to optimize child healthy growth and upcoming public health by optimizing gestational foetal cell omics. A particular emphasis is placed on obesity. This is also to minimize risks from metabolic complexities. Affecting genome properties in foetal cells may be realized by optimizing pregnant women's life style and food regimens. Optimizing exercise intensity, frequency and timing, circadian eating occasions, social interactions and atmosphere and exposure to fluctuating environments are to be pursued.

Keywords: foetal health, gestation, genomics, obesity

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Discussion of philosophy

Gestation is characterized by challenging of maternal metabolism and health and thereby child quality of birth and postpartum growth and development. Despite lasting for only approximately 9 months, foetal life must be considered greatly crucial in determining the entire lifetime quality of the resulting individual as a child, youth, adult and elderly.[1–3] This means that many health issues that neonates, children, adults and elderlies suffer from may be effectively prevented or become workable with minimal unfavourable effects, should foetal genomics be manipulated constructively and rhythmically during gestation.[2–4]

Many of today's diseases and health problems such as obesity, diabetes, cardiovascular malfunction, nervous system's abnormalities, memory issues and aging related challenges possess in some way roots in gestational environment and genomic developmental properties. For instance, effective adaptation to reduced air oxygen pressure, cold temperatures, humid conditions and nutrient availability variations can fundamentally develop over pregnancy when foetal genomics properties develop and specialize.[2] Another example is obesity that has been a real threat to quality human life, which can be prevented at least in part via manipulating gestational characteristics of foetal cellular omics.[4]

Regular, appropriate and adequately intensive physical activity during all phases of pregnancy can improve maternal intermediary metabolism by enhancing insulin sensitivity and minimizing gestational visceral adiposity and diabetes.[1,4–7] This could basically enhance foetal genomic status in preventing obesity and dealing with glucose intolerance at certain unique times over the resulting individual lifespan. Sufficient exercise during pregnancy can modulate maternal substrate turnover and optimize fuelling foetal tissues for healthy growth towards optimal birth weight and height. For instance, for a foetus whose parents are lower than average in body size and height, gestational optimization in extent and timing of exercise, resting and eating can generate a child that is normal and above average in phenotype. It is theorized that childhood and adulthood obesity risk may be effectively minimized by optimizing maternal and thus, foetal nutrient metabolism.

Evening and nocturnal overeating during pregnancy is greatly discouraged.[8,9] Due to nocturnal glucose intolerance, large nocturnal meals may seriously damage pancreatic cells and increase diabetes development and indeed central obesity. The latter weakens immunity and sets the stage for occurrence of other health disorders. Cancer and obesity are currently among hot research topic as far as maternal and child-adult health and life quality are concerned.[10–18]

Involvement in thought-provoking and psyche-relaxing social activities is suggested to improve neonatal adaptations to the new environment post-birth. Timely and complementary brain development and nervous function may be optimized as the neonate grows, as a result. However, it is unexplored if such a gestational training, social and nutritional program can affect occurrence of any of brain and nerve related diseases frequently observed today.

Conclusion

Optimizing embryonic and foetal cell omical properties including genomics and proteomics through optimizing maternal daily programs of physical and social activities as well as nutrition and health, could help optimize neonatal, childhood, youthhood, adulthood and elderly quality of life. Future research on further expansion and specification of the theory is required.

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Conflict of interest

The author declares no conflict of interest.

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