

Perspective Article

Timing of Physical Training to Optimize Metabolism: Founding a Workable Public Health Program

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Summary

This article finds a public health program involving optimal exercise timing. Although exercise per se is by all means health-improving, at certain times of the circadian phase it could be more synchronous with internal physiological rhythms of cell metabolism. Afternoon and especially evening physical work could enhance glucose tolerance and improve insulin-oriented substrate oxidation and waste management. This is due to the evolutionary cell physiology that demands highly active diurnal cell metabolism and much less active nocturnal nutrient turnover when body prevails to rest and not burn much energy. Nonetheless, care must be exercised to not overly pressure the body late in evening and not adversely affect sleep.

Keywords: Exercise Timing; Nutrient Turnover; Public Health; Chronobiology

Philosophy and Objective

This article describes a novel perspective of exercise biology in optimizing public health programs. The perspective is concerned with timing of physical work to better meet cell requirements for biochemical dynamics and optimal functionality and longevity. Fundamentally, exercise is a must for the modern man already exposed to a variety of stressors such as passive lifestyle, stressful urbanism, unnatural life rhythms, and untimely nutritional regimens circadian-wise [1]. Spending more circadian time sitting at work and home and less time for intense exercise and proper sleep exacerbates the current state of modern human life quality. Thus, global workable exercise strategies are required to minimize the challenges of the modern suboptimal lifestyles. This article encounters with such a significant public health subject through development of a timely exercise program.

Critical Discussion

Since human physiologically is oriented based on its evolu-

tion of intermediary metabolism and endocrinology, evening and overnight are when the body is more prone to metabolic complexities [1-4]. Both body and brain human work is affected by such evolutionary patterns of lifestyle [5]. Owing to the occurrence of most physical and mental activities during morning and day-time, hormones of mainly insulin have evolved to be more actively involved in metabolic bio-processing during light-phase of the circadian period. As a result of the much less nutrient required overnight vs. day-time, less insulin must be needed to handle nutrients consumed [6,7].

Based on the above philosophies and principles, should nutrients be oversupplied in evening and night, intermediary metabolism may not effectively bioprocess them towards a healthy balance between substrate supply and demand [8,9]. Splanchnic metabolism could be adversely influenced by such an asynchrony [10]. This challenge becomes more problematic when the lack of adequate intense physical work reduces internal capacities for substrate oxidation and turnover [11-13]. As such, regardless of timing, exercise could be

greatly health-improving. However, since time is short for the very busy modern man being at work for the most of the day, timing of exercise gains increasing importance [14-17]. Scheduling the adequately intense exercise (causing consistent and prolonged sweating and increased heart rate) of lasting for at least 20-30 min for late afternoon and early evening is considered an optimal strategy. This biological approach is consistent with the evolutionary human metabolism and can improve insulin sensitivity and glucose tolerance during the most risky times of the circadian period [13,14]. It is likely that optimizing exercise and eating timing could reduce risks from cardiometabolic disorders and cancer [18-20].

In a nutshell, the metabolic and public health benefits of physical activity may be considerably expanded through optimizing exercise timing. This systematic approach is well suited to the greatly abnormal and arrhythmic modern lifestyle. Improving public education on such a significant matter is of increasing importance for establishing a sound deep-rooted science for quality life [21].

Implications

Optimal timing of adequately intense physical exercise has immense capacities to improve human endocrinology and metabolism. The evolutionary and challenging reductions in glucose tolerance and insulin sensitivity can be effectively overcome with appropriate timing of exercise in the modern metabolically imbalance lifestyle.

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