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Perspective Article

Optimizing Metabolic Rhythms through Regular Daily Exercise: A Global Guideline

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Abstract

This article creates a new vision on exercise-driven endocrinology for generating regular circadian patterns of healthy intermediary metabolism and cardiovascular dynamics. An emphasis is placed on the necessity of establishing short-term regularities in cell physiology through daily exercise. Weekly programs and minimalism on physical activity is greatly criticised. Nature must be the final target and source of inspiration for the modern man to realize optimal life quality in the overmodernized age.

Keywords: Endocrinology; Metabolism; Exercise; Circadian pattern

Innovation and Discussion

Weekly recommendations on minimal limits of physical activity must be criticised for the natural fact that cell physiology functions under circadian patterns. The weekly recommendations for exercise of any duration do not demand a minimum length and intensity of physical work on a daily basis. Regular daily exercise allows both leading endocrinological and peripheral cells to develop high sensitivity towards internal and external metabolic messengers including those initiated by hormones (Figure 1). Insulin, for instance, acts via mediating proteins that build special structures to enable cells to receive nutrients of mainly glucose and amino acids timely and adequately (Figure 2). This is to avoid obesity and diabetes. Failure to remind cells such a regular continuous daily nutrient entry - by not conducting daily and adequately intense exercise – would rather create irregular patterns that interfere with normal cell function. Cells must be taught to respond quickly, regularly and rhythmically to nutrients presence most preferably within a circadian timeframe (Figure 3).

Recent discoveries and recommendations described the importance of circadian timing of nutrient consumption and oxidation for improved metabolic health [1-5]. Notable, cancer has been suggested to be preventable and workable through establishing circadian regularities in eating, resting and physical working [6]. Time has already come to view human endocrinology as an interscience being under circadian orchestration, which must be dealt with through circadian strategies. Because human cells tend to develop nocturnal insulin resistance and glucose intolerance, eating large energy-dense meals during evening and night must be avoided [7-11]. With that, adequate daily exercise (e.g., at least 25-30 min of intense exercise, increased heart rate, and sweating) permits cells to harmonically prepare the whole body for normal endocrinology and metabolism during the forthcoming circadian period (Figure 3). It must be noted

that such a daily exercise requirement applies to all of those who are healthy enough to move their major parts of the body, including both healthy and patient individuals. Certainly, unusual patients with considerable physical, cardiovascular and mental disabilities require their own and individualized fitting exercise regimens.

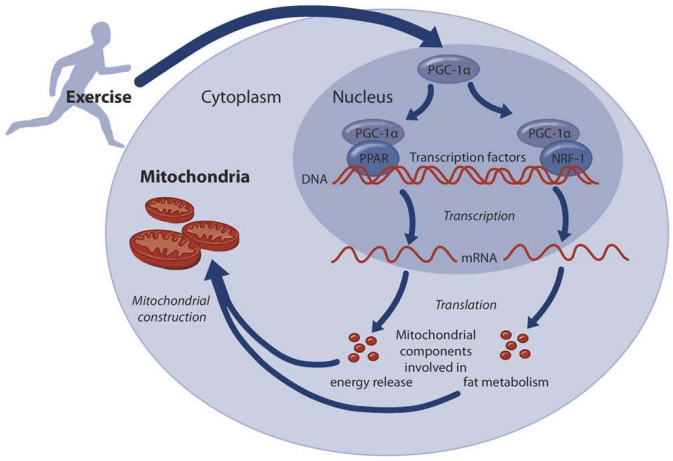

Figure 1. Exercise-driven initiations of the mechanisms involving synthesis of proteins and inducing factors that regulate timely substrate oxidation and energy release. This health-maintaining process must be taught to cells on a circadian basis.

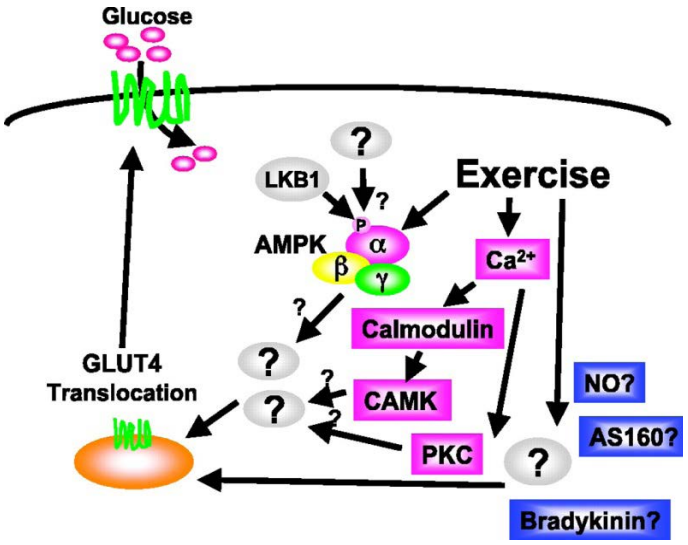

Figure 2. Proposed impacts of regular rhythmic exercise on generating critical proteins and messengers for optimal cell endocrinology and metabolism.

More research will be required to focus on optimal circadian times of physical activity. However, nature-wise, early morning and later afternoon respectively just before and after the activity period should be suitable times for preparing both splanchnic and peripheral cells to timely create optimal patterns of endocrinology [11,12]. Nature and its circadian patterns must be the ideal rhythms to approach for effective prevention of obesity, diabetes and related cardiometabolic disorders. In addition, circadian timing of eating, exercise and resting all need to be optimized for improved life satisfaction [13-15].

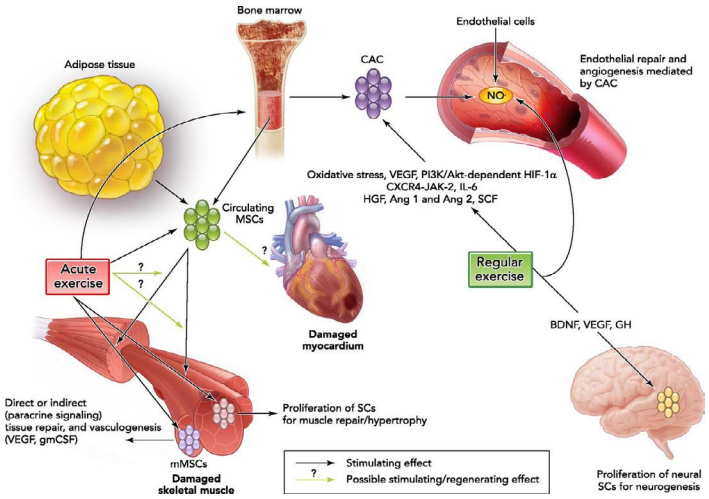

Figure 3. Exercise-driven harmony in endocrinology and healthy metabolic interactions among nervous, splanchnic, cardiovascular and peripheral tissues for effectively-waste-managed nutrient utilization.

Implication

This article created a new pragmatic vision on physical activity to be conducted adequately intense and essentially daily and not in longer intervals. A minimum daily intense exercise of 25-30 min for the general public is an obligation to meet metabolic and health requirements for normal rhythmic operation. This pragmatic guideline originates from nature where human physiology has evolved to function on circadian patterns of endocrinology and metabolism for a healthy lifetime.

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