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Journal of Clinical Immunology and Microbiology

Short Communication

Night Meals to Pay Bills: An Immunological Innovation

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Received Date: 12-09-2022; **Accepted Date:** 29-09-2022; **Published Date:** 06-10-2022

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Abstract

This objective of this policy opinion article was to address a perspective if chrono-eating can help prevent immunodeficiency diseases by optimizing circadian rhythms of nutrient assimilation and metabolism. In the modern era, eating timing, sequence, and frequency have been modified significantly. People tend to consume fast foods during later times of the circadian phase or almost 24-h period. Rising evidence indicates that eating at wrong times (i.e., evening and night) and inadequate physical activity would lead to suboptimal physiological rhythms of nutrient assimilation and metabolism. This trend is postulated to weaken immunity and cause obesity, diabetes, and other immunodeficiency and autoimmune diseases. These abnormalities are amongst the foremost metabolic disorders worldwide. Eating slowly releasing energy later in the evening and overnight may help optimize immunity. Therefore, chrono-eating is a mounting science that helps optimize circadian food consumption behavior to prevent, or at the very least, reduce immunodeficiency and associated metabolic disorders development.

Keywords

Chrono-Eating; Circadian Rhythm; Nutrient; Immunodeficiency; Physiology

Nikkhah A | Volume 3; Issue 3 (2022) | JCIM-3(3)-055 | Short Communication

Citation: Nikkhah A. Night Meals to Pay Bills: An Immunological Innovation. J Clin Immunol Microbiol. 2022;3(3):1-4.

DOI: <http://dx.doi.org/10.46889/JCIM.2022.3301>

Philosophy and Elaboration

This objective of this opinion article was to develop and address a public policy if chrono-eating can help prevent immunodeficiency diseases by optimizing circadian rhythms of nutrient assimilation and metabolism. The Suprachiasmatic Nucleus (SCN) is a structure in the hypothalamus and a central clock that contributes greatly to regulating circadian rhythms of nutrient metabolism [1,2]. Glucose tolerance, for instance, decreases during evening and night probably because less nutrients are required overnight when the human body is at rest [3]. Hence, eating large evening or night meals of mainly high-sugar foods should be avoided to reduce immunodeficiency diseases such as obesity and diabetes. These suggest reduced insulin sensitivity and pancreatic β -cells function overnight [2]. Increased insulin resistance is a predisposing factor for autoimmune diseases and diabetes development [4]. Moreover, energy over-consumption may cause splanchnic and abdominal adiposity, which could increase hepatic insulin resistance and lead to suboptimal hepatic and peripheral nutrient metabolism [4]. This cascade implies that nutrient over-flow overnight may increase immunodeficiency and its related disorders likelihood [5].

Glucose assimilation and metabolism are precisely entrained with circadian systems. Thus, altering the main eating time from morning to evening might cause hyperglycemia and its related challenges. The evening chronotype individuals are more willing to consume foods heavily overnight. Night workers, for example, exhibit reduced glucose tolerance, and thus, are at high risks of metabolic disorders. This suggests weakened immunity and abnormal circadian metabolism of glucose in shift workers and nocturnal eaters [6].

Furthermore, increased melatonin secretion occurs in late eaters, suggesting impaired glucose/nutrient metabolism and troubled glucose circadian rhythms [2]. Melatonin is branded for its role in sleep-cycle and circadian rhythms regulation. Elevated melatonin secretion overnight coincided with intense night eating could further impair glucose metabolism towards reduced glucose tolerance and increased immunodeficiency [7]. Hence, immunodeficiency and increased diabetes risk in nocturnal eaters and shift-workers might be, at least partly, because of the disrupted circadian rhythms of glucose metabolism. Apart from that, melatonin may inhibit insulin secretion that might complicate the challenge further [7].

From a meal-timing perspective, hence, chrono-eating implies that energy-dense nutrients should be consumed rather early in the morning when physical activity and brain work are at peak [5]. As such, for improved immune function and reduced risks of immunodeficiency and autoimmune diseases, taking breakfast is encouraged, but night eating is discouraged [8]. More functional nutrient/waste management will depend, also, on appropriately coordinated eating and physical activity that warrants future research. Another simple mechanism of diabetes development is related to sarcopenia that could be reduced with optimal chrono-eating [8-11].

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All in all, chrono-eating is an emerging science that can provide a simple approach to help optimize immune function and reduce risks from immunodeficiency diseases [9,10,12,13].

Implication

Effective nutrient assimilation and metabolism are concerted via circadian rhythms. For example, glucose tolerance, decreases overnight. Night eaters may exhibit hyperglycemia more often. The greater hyperglycemia alongside increased insulin resistance could weaken immunity towards metabolic syndromes development. Chrono-eating as a growing science has a pivotal role in helping prevent, or at the very least, reduce immunodeficiency and its related metabolic complications. This would be accomplished through improved nutrient metabolism circadian rhythmicity. Innovative investigations are warranted to discover the optimal times of the circadian phase for consumption of different foods and fruits to boost immunity and prevent/reduce metabolic disorders.

Conflict of Interest

Author declare no conflict of interest.

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