MedPress
Nutrition & Food Sciences

Night Eating: The Light Killer?

Perspective Article

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Article Information

Received: 24-07-2022;
Accepted: 01-08-2022;
Published: 03-08-2022.

Abstract

This perspective article aimed to develop a question if night eating interferes with normal circadian nutrient metabolism in humans. The modern man has tremendously changed his circadian eating time, sequence, and frequency. The modern human prefers to eat fast foods at later times of the circadian phase. Bad time or night eating and lack of adequate physical activity may interfere with optimal physiological rhythms of nutrients and hormones metabolism. This can cause diabetes and obesity, two foremost metabolic disorders worldwide. Eating less available energy overnight may help optimize human chrono–physiology. Optimal chrono–nutrition through optimizing meal timing offers modern humans a practical lifestyle to help prevent or at the very least reduce risks of disability in today's stressful life.

Keywords: Chrono–Nutrition; Circadian Rhythm; Night Eating; Physiology; Science.

Philosophy

The aim of this perspective article was to develop and address a question if optimal chrono–nutrition can help prevent today's major health issues (e.g., diabetes and obesity) by optimizing the circadian rhythms of nutrient assimilation and metabolism. The superchiasmatic nucleus (SCN) is a structure in the hypothalamus that helps orchestrate circadian rhythms of nutrient metabolism [1,2]. Glucose tolerance, for instance, decreases at night simply because less nutrients are needed overnight during much reduced physical and mental activities [3]. As such, eating large night meals of mainly sugary and starchy foods should be avoided to reduce risks of diabesity. Research on the circadian rhythms of nutrient metabolism indicate reduced insulin sensitivity and pancreatic β–cells function at night vs. morning [2]. Greater insulin resistance is a predisposing factor for development of type 2 diabetes [4]. Moreover, insulin resistance and energy over–eating lead to splanchnic adiposity, likely increasing hepatic insulin resistance and suboptimal hepatic and peripheral glucose metabolism [4]. Subsequently, glucose over–flux overnight increases the risk of insulin resistance that could increase diabesity risks [5]. Nutrient assimilation and metabolism are pedantically related with circadian systems. Hence, over–eating dinner leads to increased hyperglycemia and its associated complexities. The night chronotype individuals tend to eat largely overnight. For example, shift or night workers experience lower glucose tolerance, and thus, are at greater risks of diabesity. This suggests abnormal circadian metabolism of nutrients in night eaters and shift workers [6].

In addition, increased melatonin secretion in late and night eaters could suggest impaired nutrient and energy metabolism and disturbed glucose circadian rhythms [2]. Melatonin is needed for normal sleep and optimal nutrient circadian rhythms regulation. Increased melatonin secretion overnight, if coincided with night over–eating, may further harm energy metabolism towards reduced glucose tolerance and increased insulin resistance. Therefore, increased diabesity risks in night–eaters and shift–workers might be, at least in part, due to such disturbed circadian rhythms in energy metabolism. Moreover, melatonin may inhibit insulin secretion and action. This could compound the challenge.

From a pragmatic metabolic perspective, hence, optimal chrono–nutrition means that energy–dense meals must not be eaten at night when body and brain work are considerably low. Accordingly, while eating breakfast should be encouraged, night eating must be dispirited. It must not be forgotten that in addition to optimal eating timing, improved overall health will depend on optimal eating–exercise coordination. This needs much investigation to be well elucidated. All in all, chrono–nutrition as a rising science provides the modern man with a pragmatic, simple, and feasible lifestyle strategy towards optimizing nutrient circadian metabolism. This innovation should lead to decreased diabesity risks and improved general health and wellbeing. Future research will be warranted to shed light on various aspects of this moving phenomenon.

Applications and Implications

Nutrient assimilation and metabolism are concerted through circadian or almost 24–h rhythms. Because of reduced glucose

tolerance overnight, night over–eating must be avoided; otherwise would lead to increased hyperglycemia or major risks from diabesity. The concurrently elevated blood glucose and insulin resistance are suited towards diabesity and associated issues. Optimal chrono–nutrition as an emerging science helps the modern man not be trapped by the light killer or night eating. This approach would help optimize energy and glucose metabolism over the course of the circadian period. Encouraging morning and day eating and avoiding heavy night eating should equip the man with a strong lifestyle strategy to minimize diabesity and related cardiovascular issues. Future investigations are required to enlighten the many aspects of this innovation for global and practical human uses.

Acknowledgement

Nature for its inspirations towards scientific innovations.

Conflict of interest

Authors declare that there is no conflict of interest.

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