

HEALTHY LIFESTYLE SLOWS EPIGENETIC AGING: NATUROPATHY OFFERS INSIGHT

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Abstract: Now it is established by various scientific experiments and epidemiological surveys that those who have adopted lifestyle in accordance to “biological clock” which in turn govern by natural factors, are leading healthy life compared to those who are leading so called “Modern Lifestyle”. In recent years, allopathy (ALP) and naturopathy (NAP) have become a favourite topic of discussion, the dispute remains active, and the debate over what to do about it continues. In recent years, even in allopathy medicine system rather than chemical drugs more “body friendly therapeutics” are being used, for example, gene therapy, cell therapy, stem cell implantation, biologics, and immunotherapeutic. With the better understanding of epigenetic naturopathy gained more importance. The therapeutic approach for any given disease should be adopted not on symptoms but on the basis of causes. And at last, as Ayurveda believes “Prevention is Better than Cure”, the “Eternal Truth” can guide us to remain healthy and disease free throughout our life span.

Keywords: Epigenetic Aging: Naturopathy

INTRODUCTION

Epigenetics is a switch to turn genes on and off by a mechanism using chemical tags the epigenetic marks, attaching to DNA directing the cell either to use or ignore a particular gene. One such epigenetic mark is a methyl group having the capability to block (by methylation) the attachment of proteins which normally turn the genes on by fastening to DNA (Fig.1). Epigenetic aging is the process by which the organization and regulation

of DNA degrades, which can drive aging in an organism [1]. Epigenetic changes are closely related to aging and can contribute to aging-related diseases. Understanding these mechanisms may lead to new strategies to delay aging lies in Naturopathy. Naturopathy is a way of life that aims to improve overall health and wellness through a holistic approach [2]. For example, some studies suggest that adopting healthy lifestyle choices, such as caloric restriction and exercise, can improve epigenetic age.

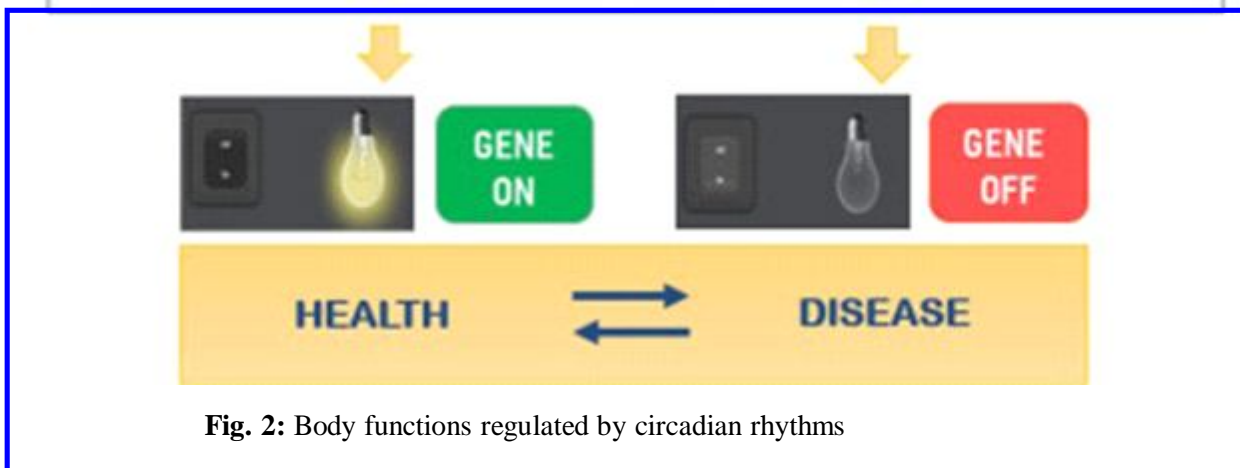
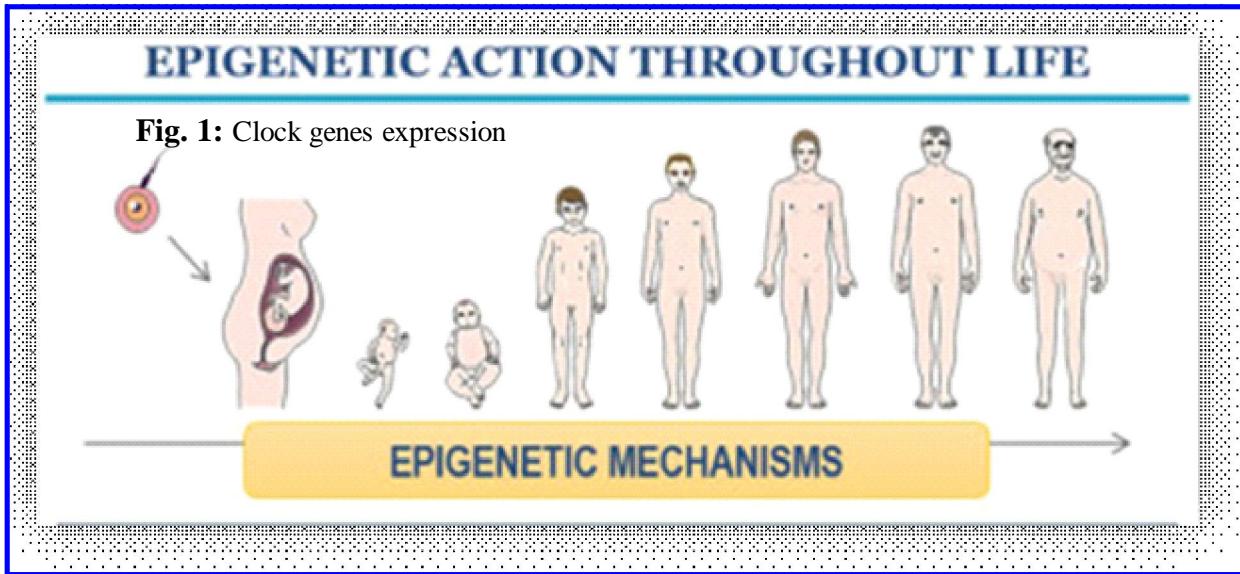


Fig. 2: Body functions regulated by circadian rhythms

There are various factors which regulate the epigenetics, out of which “Biological Clock” is the most important which in turn regulated by the Earth’s natural cycles — day and night, temperature fluctuations, ocean tides all these regulate our biological clock. These cycles influence various aspects of our lives, from the rhythms of sleep to the production of hormones. Our internal “biological clock,” a complex system of proteins encoded by numerous genes, controls these circadian rhythms [3]. The system that regulates an organism’s innate sense of time and controls circadian rhythms is called a biological clock. It’s composed of proteins encoded by thousands of genes that switch on and off in a specific order (Fig. 1). A master clock coordinates all the biological clocks in an organism. The primary regulatory centre of this system is the suprachiasmatic nucleus (SCN) in the hypothalamus,

which responds to light to maintain the timing of these processes. The secretion of melatonin is inhibited by light and triggered by darkness [4]. So, when the level of melatonin increases, we feel sleepy and when it decreases we wake up. Thus, this gland acts as a biological clock. This master clock coordinates a variety of physiological functions, including the sleep-wake cycle, hormone release, appetite regulation, and body temperature. These biological clocks help you feel alert during the day, hungry at mealtimes, and sleepy at night. Keeping your body’s daily cycles, or circadian rhythms, in sync is important for your health. “Circadian rhythms are big influencers in the body,” Disruptions in circadian rhythms have been linked to various health issues, including metabolic disorders and cardiovascular disease [5].

The importance of circadian rhythms: Circadian

rhythms are critical to the following bodily functions such as sleep, metabolism, immune response, microbiota, cancer, aging and cardiovascular response.

- * Sleep-wake cycle: Regulates alertness and fatigue in response to light and dark.
- * Hormonal regulation: Governs the release of hormones that influence mood, growth, and metabolism.
- * Metabolism: Impacts eating behaviours and digestive processes.
- * Body temperature: Helps maintain optimal internal temperature.
- * Cardiovascular function: Affects heart rate and blood pressure.
- * Urinary function: Regulates urine production based on the body's needs.
- * Energy expenditure: Optimizes energy use throughout the day.

The natural sleep cycle: Most people's natural circadian cycle is slightly greater than 24 hours. Some people naturally wake up early and some naturally stay up late. For example, it is natural for many teens to prefer later bedtimes and to sleep later in the morning than adults. The rhythm and timing of the body clocks also decline with age.

Diet and eating habits: The circadian rhythm diet, also known as the body clock diet, is basically a form of time-restricted eating plan where one eats in sync with this internal clock. "This means that you eat during the daylight hours, within a window of 12 hours or less and fast for the remaining 12 or more hours each day". The adage "You are what you eat" has profound implications for immunity, health and longevity [6], however, if ultraprocessed or junk food is consumed frequently one may suffer with many lifestyle diseases [7]. A healthy vegetarian diet involves consuming a wide range of vegetables, fruits, legumes, and whole grains, prepared using nutritious fats like groundnut oil, sesame oil etc. This contrasts with "junk food vegetarians" who rely on processed foods such as pizza and ice cream. Adopting whole foods vegetarian approach can help reduce harmful fats, promote healthier arteries, and lower the risk of chronic diseases [8].

Vegetables are rich in antioxidants, which combat oxidative stress and help repair cellular damage. Regular consumption of plant-based foods helps maintain a healthy weight, a crucial factor in preventing heart disease. Given that cardiovascular disease is the leading cause of death globally, adopting a plant-based diet may significantly reduce the risk of heart disease and stroke [9].

Role of food and diet: Eating what and when make all the difference in our health, aging, behaviour and prevention and treatment of diseases. Gupta and his team at CCMB, Hyderabad, made a pilot study on the beneficial effect of fasting and surprised to find that during fasting, lot of metabolic energy is saved. He gave scientific proof for the benefits of fasting, ranging from energy conservation to cancer prevention. This plays a pivotal role in maintaining good health [10,11]. To optimize circadian rhythms, it is essential to:

- * Establish a consistent daily routine with regular activities during the day and night to support circadian rhythm regulation.
- * Maintain regular meal times, especially for shift workers or those with irregular sleep patterns.
- * Follow a calming bedtime routine to promote better sleep quality and reduce stress.
- * Limit caffeine, alcohol, nicotine, and certain medications before bedtime to avoid disrupting sleep.
- * Expose yourself to sunlight to boost vitamin D production, essential for bone health and overall well-being.

Power of sunlight: Sunlight exposure is one of the simplest and most effective ways to enhance health and life expectancy. Sunlight triggers the production of vitamin D in the skin, which is crucial for maintaining healthy bones and preventing a range of diseases, including heart disease and diabetes [12,13]. Studies suggest that spending just 15 minutes a day outside can help maintain adequate vitamin D levels, which is especially important for older adults at risk for bone fractures and muscle weakness.

Physical activity: Exercise is another powerful tool

for extending life expectancy. Research indicates that individuals who engage in moderate physical activity for about three hours per week exhibit biological markers associated with youthfulness [14], such as DNA and cellular health, compared to sedentary individuals. Incorporating daily exercise, even through home activities like yoga or stretching, can enhance overall health, improve sleep, and increase energy levels.

Managing Stress: Chronic stress has detrimental effects on both physical and mental health. It can lead to cardiovascular disease, compromise immune function, and increase the likelihood of unhealthy behaviours like smoking and overeating. Therefore, adopting stress-reduction techniques, such as meditation or deep breathing exercises, can improve both short-term well-being and long-term health [15].

Heart health and epigenetic aging: Cardiovascular disease remains a leading cause of mortality worldwide. Lifestyle modifications, including a healthy diet, regular exercise, and stress management, can help reduce the risk of heart disease and promote a healthier life span. Studies have shown that lifestyle changes can positively impact epigenetic age biomarkers, especially in individuals with genetic predispositions for premature aging. Managing heart disease risk factors through diet, physical activity, and weight management can help delay the aging process and reduce the likelihood of heart-related deaths [16].

Role of social connections: Maintaining strong social connections is another important factor for longevity. Engaging in meaningful relationships with family and friends is associated with better health outcomes. These relationships help reduce stress and encourage healthy behaviours. Additionally, nurturing these connections through regular communication and shared experiences can improve mental and emotional well-being, further contributing to increased life expectancy [17].

Oral hygiene: Good oral hygiene is not only crucial for preventing gum disease but also for protecting

cardiovascular health. Chronic oral infections can contribute to the development of heart disease by introducing bacteria into the bloodstream, which can then contribute to plaque formation in the arteries. Regular brushing and flossing help reduce this risk, promoting both oral and cardiovascular health.

Reducing screen time: Excessive screen time, particularly television watching, can negatively impact health by promoting a sedentary lifestyle, encouraging unhealthy eating habits, and increasing stress. Reducing TV time can lead to better physical activity levels, improved social interactions, and a reduction in the stress associated with consuming media content [18].

Impact of positive thinking: Studies have shown that individuals with a positive outlook on aging tend to live longer than those with more negative views. Positive thinking can enhance heart health, reduce stress, and boost immune function, all of which contribute to better overall health and longevity. By focusing on optimism and reframing negative thoughts, individuals can improve both their quality of life and life expectancy.

CONCLUSIONS

Incorporating these lifestyle changes, including a balanced and nutritious diet, regular exercise and yoga, stress management, sound sleep, positivity regular exposure to sunrays and social connections can significantly increase life expectancy. By embracing these habits, individuals can promote healthier aging, prevent chronic diseases, and improve their overall quality of life. The journey to a longer, healthier life begins with small, positive changes that add up over time.

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