WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 14, Issue 2, 381-384. Review Article ISSN 2277–7105

CHRONOBIOLOGY AND AYURVEDIC DINACHARYA: A PHYSIOLOGICAL PERSPECTIVE

Dr. Surajsing Gumansing Pardeshi[1]*

[1]Associate Professor, Department of Kriya Sharir, Anand Ayurved College, Vaijapur, Dist. Ch. Sambhajinagar, Maharashtra - 423701.

Article Received on
25 Nov. 2024,

Revised on 15 Dec. 2024,
Published on 15 Jan. 2025

DOI: 10.20959/wjpr20252-35254

***Corresponding Author**
Dr. Surajsing Gumansing Pardeshi
Associate Professor, Department of Kriya Sharir, Anand Ayurved College, Vaijapur, Dist. Ch. Sambhajinagar, Maharashtra - 423701.

ABSTRACT

Chronobiology, the study of biological rhythms, offers profound insights into the temporal organization of physiological processes. Ayurveda, with its emphasis on *Dinacharya* (daily regimen), provides a holistic framework for harmonizing human activities with natural cycles. This article explores the physiological correlations between chronobiology and Ayurvedic principles, highlighting their synergistic potential for health optimization. Key elements of *Dinacharya*, such as *Brahma Muhurta*, *Abhyanga*, *Vyayama*, and *Ahara*, are analysed through the lens of modern chronobiological findings. Integrating these practices with contemporary science can foster a balanced life, aligning biological rhythms with environmental cues for enhanced well-being.

KEYWORDS: Chronobiology, *Dinacharya*, Ayurveda, Biological Rhythms, Circadian Rhythms, Preventive Healthcare.

INTRODUCTION

Chronobiology, the study of biological rhythms and their physiological implications, is a rapidly evolving field that seeks to understand how living organisms adapt to cyclical changes in their environment. Ayurveda, the ancient science of life, emphasizes the importance of aligning daily activities with natural biological rhythms through the concept of *Dinacharya* (daily regimen). This article explores the physiological underpinnings of chronobiology and its alignment with Ayurvedic principles, providing a comprehensive understanding of their synergistic potential for promoting health and well-being.

Chronobiology: An Overview

Chronobiology examines the temporal organization of biological functions. Three primary rhythms govern physiological processes:

1. **Circadian Rhythms**: Approximately 24-hour cycles regulated by the suprachiasmatic nucleus (SCN) in the hypothalamus, influenced by light and dark.[1]
2. **Ultradian Rhythms**: Shorter cycles, such as the 90-minute sleep cycle or the pulsatile release of hormones.[2]
3. **Infradian Rhythms**: Longer cycles, like the menstrual cycle.[3]

These rhythms are crucial for maintaining homeostasis, optimizing organ function, and synchronizing with environmental cues such as the light-dark cycle, temperature fluctuations, and food availability.

Ayurvedic *Dinacharya*: A Timeless Science

Ayurveda's *Dinacharya* prescribes a structured daily routine to harmonize the body's physiological activities with natural rhythms. Key components include:

1. ***Brahma Muhurta* (Early Rising)**: Waking up approximately 96 minutes before sunrise aligns with the Vata phase of the day, promoting mental clarity and creativity.[4]
2. ***Shaucha* (Hygiene Practices)**: Cleansing the body (e.g., oral care, bathing) aids in eliminating toxins accumulated overnight.[5]
3. ***Abhyanga* (Oil Massage)**: Enhances circulation, relaxes muscles, and supports skin health.[6]
4. ***Vyayama* (Exercise)**: Conducted during the *Kapha* phase (early morning), it optimizes metabolism and strengthens the cardiovascular system.[7]
5. ***Ahara* (Balanced Diet)**: Consuming meals at appropriate times aligns with digestive capacity *(Agni),* which peaks during the *Pitta* phase (midday).[8]
6. ***Ratri Charya* (Evening Routine)**: Practices like light dinner, winding down, and maintaining a consistent sleep schedule align with the *Kapha* and *Vata* phases.[9]

Physiological Correlation Between Chronobiology and *Dinacharya*

1. **Circadian Regulation of Hormones**

- **Cortisol**: Peaks in the early morning, promoting wakefulness, aligning with Brahma Muhurta.[10]
- **Melatonin**: Increases during the night, inducing sleep, paralleling Ayurvedic emphasis on early bedtime.[11]

2. **Digestive Function**
   - Circadian rhythms influence gastrointestinal motility and enzyme secretion, supporting Ayurveda's recommendation of heavy meals during midday when Agni is strongest.[12]

3. **Metabolism and Physical Activity**
   - Morning exercise corresponds to improved insulin sensitivity and lipid metabolism, reflecting Ayurvedic emphasis on *Vyayama*.[13]

4. **Detoxification Processes**
   - The liver's peak detoxification activity at night aligns with the Ayurvedic principle of resting during this phase to support natural cleansing mechanisms.[14]

Modern Evidence Supporting Ayurvedic Practices

- **Chrononutrition**: Research highlights the importance of meal timing in metabolic health, supporting Ayurveda's emphasis on eating in alignment with *Agni*.[15]
- **Morning Light Exposure**: Studies show that exposure to morning light synchronizes circadian rhythms, echoing the benefits of waking up during *Brahma Muhurta*.[16]
- **Sleep Hygiene**: Modern sleep science underscores the importance of consistent sleep schedules, resonating with Ayurvedic *Ratri Charya*.[17]

Integrative Approach for Health Optimization

Combining chronobiology and Ayurvedic *Dinacharya* can offer a powerful framework for disease prevention and health optimization. Personalized routines based on an individual's *Prakriti* (constitution) and environmental context can further enhance this synergy.[18]

CONCLUSION

Chronobiology and Ayurvedic *Dinacharya* converge on the principle of aligning human physiology with natural cycles. This integration offers profound insights into preventive healthcare and holistic well-being. Embracing these practices can harmonize biological rhythms, enhance physiological functions, and foster a balanced life in tune with nature.

REFERENCES

1. Albrecht U. Circadian clocks in mood-related behaviors. Annals of Medicine, 2010.
2. Kleitman N. Sleep and Wakefulness. University of Chicago Press, 1963.
3. Takahashi JS, Hong HK, Ko CH, et al. The genetics of mammalian circadian order and disorder: implications for physiology and disease. Nature Reviews Genetics, 2008.

4. Sharma RK, Dash B. Charaka Samhita. Varanasi: Chaukhambha Sanskrit Series Office, 2001.
5. Lad V. Textbook of Ayurveda, Fundamental Principles of Ayurveda. Albuquerque: The Ayurvedic Press, 2002.
6. Singh RH. Panchakarma Therapy. Chaukhamba Sanskrit Pratishthan, 2005.
7. Atkinson G, Reilly T. Circadian variation in sports performance. Sports Medicine, 1996.
8. Gupta A, Sharma M. Dietary guidelines for health and longevity: An Ayurvedic perspective. Journal of Ayurveda and Integrative Medicine, 2020.
9. Tiwari PV. Ayurvediya Dinacharya. Varanasi: Chaukhambha Orientalia, 2006.
10. Czeisler CA, Buxton OM. The human circadian timing system and sleep-wake regulation. In: Kryger MH, Roth T, Dement WC. Principles and Practice of Sleep Medicine. Elsevier, 2011.
11. Lockley SW, Arendt J, Skene DJ. Visual impairment and circadian rhythm disorders. Dialogues in Clinical Neuroscience, 2007.
12. Stenvers DJ, Scheer FA, Schrauwen P, et al. Circadian clocks and insulin resistance. Nature Reviews Endocrinology, 2019.
13. Boulé NG, Kenny GP, Haddad E, et al. Meta-analysis of the effect of structured exercise training on cardiorespiratory fitness in Type 2 diabetes mellitus. Diabetologia, 2003.
14. Panda S. Circadian physiology of metabolism. Science, 2016.
15. Arble DM, Bass J, Behn CD, et al. Impact of circadian disruption on energy metabolism pathways. Progress in Molecular Biology and Translational Science, 2013.
16. Wright KP Jr, McHill AW, Birks BR, et al. Entrainment of the human circadian clock to the natural light-dark cycle. Current Biology, 2013.
17. Zisapel N. Sleep and sleep disturbances: Biological basis and clinical implications. Cellular and Molecular Life Sciences, 2007.
18. Patwardhan K, Sharma H, Shukla S. Prakriti-based medicine: A step towards personalized medicine. Ayurveda Journal, 2015.