



A conceptual study on nidra as adharniya vega and it's role in metabolic diseases

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Abstract

The ultimate goal of *Ayurveda* is to achieve health of every human being. *Nidra* is one of the most important dimensions of health amongst the *Trayaupstambha* i.e. *Aahara*, *Nidra* and *Brahmacharya*. It is essential phenomenon for maintenance and restoration of both body and mind. Modern lifestyle and the demands of today's world can contribute to sleep deprivation for many people. But, the biological clock which is mandatory for the well being of life's rhythm is getting disturbed due to it. Once this harmony is violated sleep as well as total health will be hampered because sleep runs according to biological clock. The importance of sleep is well accepted by modern science because of its restorative, recuperative and resting actions to the living organisms. This lack of sleep can lead to many conditions such as gastro-intestinal disorders, metabolic disorders, autoimmune diseases, reproductive issues, etc. *Ayurveda classics* have long ago identified the negative consequences of night awakening in the context of *Adharniya Vegas*. Sleep deprivation has been associated with an increased risk of various metabolic diseases. When the body does not get enough sleep on a regular basis, it can disrupt several physiological processes involved in metabolism, leading to the development or worsening of metabolic diseases. This concept has been enlightened in this article.

Keywords: *Adharniya Vega*, *Nidra*, Metabolic disorders, Circadian Rhythm

Introduction

In *Ayurveda*, adequate and restful sleep is considered crucial for maintaining overall health and well-being. Sleep deprivation causes a disturbance in the balance of *Doshas* (energies) and can have negative impact on both physical and mental health. It has recognized *Nidra* as one of the most important dimensions of health and is acknowledge as one amongst the *Trayaupstambha*.

Acharya Charka has mentioned *Nidra* as one of the *Adharniya Vega* which can cause various ill effects on a person's health. Several factors in today's world can disrupt sleep patterns and lead to insufficient sleep such as long working hours, engaging in late night social activities, prevalence of electronic devices, such as smartphones, tablets, and computers, can interfere with sleep. The blue light emitted by these devices can suppress the production of melatonin, a hormone that helps regulate sleep, making it harder to fall asleep and maintain a good sleep quality. This leads to a disturbance in circadian rhythm which is linked to an increased risk of metabolic diseases. The circadian rhythm is the body's internal clock that regulates various physiological processes, including sleep-wake cycles, hormone production, metabolism, and energy regulation. Metabolic disorders refer to a group of conditions characterized by abnormalities in the body's metabolism, which is the process of converting food into energy and the utilization of that energy by cells. These disorders can affect

various aspects of metabolism, including digestion, absorption, transportation, and storage of nutrients. Some common metabolic disorders include obesity, diabetes mellitus, dyslipidemia, metabolic syndrome, etc.

Material and methods

Ayurveda classics, Modern medicine text books, relevant published research articles and internet source related to this topic has been used for present research work.

Definition

Sleep is defined as a state or condition in which a person's mind including the sensory and motor organs get exhausted, and they dissociate themselves from their objects. In human beings, happiness and misery, nourishment and emaciation, strength and weakness, fertility and infertility, and longevity and death depend upon proper (and improper sleep). Untimely, excessive sleep and sleep deprivation hampers both happiness and longevity of a person. On the other hand, proper sleep brings about happiness and longevity in human beings just as real knowledge brings about spiritual power in *Yogis*.

Importance of Nidra

The person having *Samyak Nidra* (proper sleep) will have *Sukha* (happiness), *Pushiti* (good physique), *Bala* (strength), *Vrushta* (sexual power), *Gyan* (knowledge), *Jivita* (long life).

The person having *Asamyak Nidra* (improper sleep) will suffer from *Dukha* (unhappiness), *Karshya* (emaciation), *Abala* (weakness), *Klibata* (impotence), and *Agyan* (illiteracy), *Ajivita* (death).

Nidra as Adharniya Vega

Acharya Charaka has mentioned 13 natural urges which should never be suppressed. '*Nidra*' being one of them should never be suppressed. Sleep suppression leads to excessive yawning (*Jrumbha*), bodyache (*Angamarda*), drowsiness (*Tandra*), diseases of head & eyes (*shiro-akshi roga*), etc. *Acharya Sushruta* has mentioned that the *Nidra Vegadharanajanya lakshna* resembles to the diseases of *vata* and *pitta* Such as *Kasa*, *Swasa*, *Pratisyaya*, *Shirogaurava*, *Angamarda*, *Jwara*, *Agnidaurbalya*.

CIRCADIAN RHYTHM

Circadian rhythms refer to the cyclical changes like fluctuations in body temperature, hormone levels, sleep, wakefulness that occur over a 24-hour period, driven by the brain's biological clock. The biological clock consists of a group of neurons in the hypothalamus called supra chiasmatic nucleus (SCN). These internal 24 hour rhythm in physiology and behavior are synchronized to the external physical environment and social/work schedules. In humans, light is the strongest synchronizing agent. Light and darkness are external signals that control the biological clock and help to determine when weneed to wake up or go to sleep.

DISRUPTIONS OF CIRCADIAN RHYTHM

Circadian rhythm disturbance has been linked to an increased risk of metabolic diseases. Disruptions in the circadian rhythm can occur due to factors such as shift work, jet lag, irregular sleep patterns, and exposure to artificial light at night. These disruptions can have negative effects on metabolism and increase the risk of metabolic diseases such as obesity, type 2 diabetes, and cardiovascular problems. Biological rhythmicity is important for metabolic health, but circadian rhythms are affected and impaired by nocturnal activities and irregular food intake in modern society. Maintenance of a physiological circadian rhythm is crucial for metabolic health and is an important strategy for combating obesity.

OVERVIEW OF CIRCADIAN RHYTHM SLEEP DISORDERS:

There are six distinct CRSDs currently recognized in the International Classification of Sleep Disorders (ICSD-2)

1. Delayed sleep phase type
2. Advanced sleep phase type
3. Irregular sleep-wake phase type

4. Free-running type
5. Jet lag type
6. Shift work type

“The essential feature of CRSDs is a continuous or recurrent pattern of sleep disturbance primarily due to alterations in the circadian rhythm or a misalignment between the endogenous circadian rhythm and exogenous factors that affect the timing or duration of sleep.” Thus, either exogenous or endogenous factors or often both can contribute to the misalignment between the timing of internal circadian rhythms and the desired or required time for sleep.

SHIFT WORK SLEEP DISORDER:

Although the term “shift work” lacks an appropriate definition, shift work has been defined as occurring when at least a portion of the shift occurs between 7:00 PM and 6:00 AM. The symptoms of insomnia and excessive somnolence in association with some degree of social, occupational, or other impairment are collectively known as shift work sleep disorder (SWSD).

PATHOPHYSIOLOGY :

From a physiologic perspective, shift work means a sleepwake schedule that is different from the natural, endogenous rhythm of sleep and wakefulness. This leads in shift workers experiencing impairments in both sleep and wakefulness that occur from the desynchronization of the two processes that regulate these physiologic functions. The sleep is regulated by interaction between a “homeostatic pressure” to sleep and a “circadian alerting signal” that causes wakefulness. The homeostatic pressure increases with each hour of wakefulness and gradually leads to disturbance in sleep. Suprachiasmatic nucleus of the anterior hypothalamus regulates circadian alerting signal. These disturbances leads to hampering of many physiologic functions that vary across the day, such as body temperature, blood pressure, and hormone secretion, including cortisol and melatonin. After the onset of sleep, as homeostatic sleep pressure decreases, the circadian alerting signal also then subsides. The synchronization of circadian rhythms to the 24hs cycle is mainly maintained by external and environmental causes. The natural light/dark cycle is one of the main factors affecting circadian regulators. Misalignment between the endogenous circadian rhythm and the external 24-hour environment forms the basis for SWSD.

ROLE IN METABOLIC DISORDERS

Biological rhythmicity is important for metabolic health, but circadian rhythms are affected and impaired by nocturnal activities and irregular food intake in modern society. Maintenance of a physiological circadian rhythm is crucial for metabolic health and is an important strategy for combating obesity.

The circadian rhythm plays a crucial role in regulating various metabolic processes within the body. It helps in maintaining a wide range of physiological functions, including sleep-wake cycles, hormone secretion, body temperature regulation, and metabolism. When this rhythm is disrupted, it can lead to metabolic disorders.

1. **Obesity:** Disruption of the circadian rhythm, such as irregular sleep patterns or shift work, has been linked to obesity. This is partly because the circadian system influences appetite- regulating hormones like leptin and ghrelin, as well as the timing of food intake. Irregular eating patterns can disrupt the body's metabolism, leading to weight gain and obesity.
2. **Type 2 Diabetes:** The circadian rhythm influences insulin secretion and sensitivity. Disruption of this rhythm, as seen in individuals with irregular sleep patterns or those with work night shifts, can lead to insulin resistance and impaired glucose tolerance, contributing to the development of type 2 diabetes.
3. **Cardiovascular Diseases:** Circadian disruptions have been associated with an increased risk of cardiovascular diseases such as hypertension, coronary artery disease, and stroke. This is partly because the circadian rhythm influences blood pressure regulation, heart rate variability, and the timing of cardiovascular events.

4. **Metabolic Syndrome:** Metabolic syndrome is a cluster of conditions including obesity, high blood pressure, abnormal lipid levels, and insulin resistance. Disruption of the circadian rhythm can contribute to the development of metabolic syndrome by influencing multiple metabolic pathways.

5. **Non-Alcoholic Fatty Liver Disease (NAFLD):** The circadian rhythm regulates liver metabolism, including processes such as glucose and lipid metabolism. Disruption of this rhythm, such as through irregular eating patterns or circadian clock gene mutations, can contribute to the development of NAFLD and its progression to more severe liver diseases.

DISCUSSION

Understanding the interplay between the circadian rhythm and metabolic processes is essential for the development of strategies to prevent and treat metabolic disorders. Lifestyle modifications such as maintaining regular sleep-wake cycles, adopting healthy eating habits, and minimizing exposure to circadian disruptors like artificial light at night can help support metabolic health. Additionally, research into pharmacological interventions targeting the circadian system holds promise for the management of metabolic disorders in the future.

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