

THE PHYSIOLOGICAL STUDY OF NIDRA W.S.R. OF BIOLOGICAL CLOCK

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ABSTRACT

Humans spend almost a third of their lifetime sleeping. Good sleep is essential and advantageous to the quality of life. A number of vital physiological changes occur during sleep and help people stay healthy and function at their best. Ayurveda regards nidra (sleep) as one of the most essential factors responsible for a healthy and fulfilling life. It is one of the Trayopastambhas (three great subsidiary pillars) on which a person's health is firmly balanced. According to Ayurvedic concepts, body is made up of three types of Doshas, viz. Vata, Pitta, Kapha. Balancing between Doshas leads to health whereas the imbalance leads to disease condition. At specific time in each day, or seasons or at given age the balance between Tridosha is in constant flux. Balancing of Doshas is possible with 'Dinacharya' and 'Rutucharya', which will lead to syncing of the inner biological clock.^[6] As per Ayurvedic science, nidra is one among most essential factors responsible for a healthy life. It is one of the trayopastambha i.e., three basic supporting pillars on which the health of a person depends.^[7] Nidra is a very important regimen of day to day life, which if not taken properly can cause severe pathological manifestation, which will affect somatic, psychological and sexual health as well. The life style changes of recent era i.e., not following dincharya, ritucharya etc. have led to various disorders. Nidra plays an important role in all of them. In Ayurvedic literature, sleep is one of the four basic, natural instincts, and is considered as the pioneer for health; the remaining three being the desire to eat, drink and have sexual contact. In almost all Samhitas, there is detail description of Dinacharya, Ratricharya, Ritucharya, Ahara Vidhi, Adharaniya and Dharaniya vega, Sadvritta etc. is given which are very helpful to an individual for healthy life and prevention of diseases. Nidra is part of lifestyle and may cause many diseases.^[21]

KEYWORDS: Doshas, Ayurveda, Dinacharya, Rutucharya, biological clock, disease, nidra.

INTRODUCTION

Sleep is abroad term which affects various bodily functions regulated by it. In today's modern era, it has been a topic of great concern. Due to increased technologies, night shift duties, excessive social networking indulgence, stress etc. there has been some direct or indirect impact on the quality of a healthy sleep which in turn affects the health of an individual. Nidra is an essential phenomenon of life, which affects the physical as well as mental status of an individual. There is a wide description of sleep in Ayurveda as an important part of traya-upstambha as well as in context of various disorders. Circadian rhythm is the cyclical 24-hour period of human biological activity. Within the circadian (24-hour) cycle, a person usually sleeps approximately 8 hours and stays awake for 16 hours. During the wakeful hours, mental and physical functions are most active and tissue cell growth increases. During

sleep, voluntary muscle activities nearly disappear and there is a decrease in metabolic rate, respiration, heart rate, body temperature, and blood pressure.^[11] In *Ayurveda*, this concept is based on three *Doshas*- Vata, Pitta, Kapha - which predominantly govern our daily routine life. These *Doshas* maintain the integrity of our body by creating, assimilating & diffusing strength.

Nidra gives nourishment to the body, keeping us away from the diseases. Nidra is one which helps to attain longevity, memory, intelligence, and freedom from disease, youthfulness, excellence of luster, complexion, voice, optimum development of physique and sense organs, mastery over phonetics, and brilliance. Nidra is also helpful to increase the immunity of the person to keep him away from the disease also reverses the disease processes and prevents the reoccurrence. Ayurveda being a science of life, explains daily routine and

regimens to be followed by individuals to stay healthy. Nidra being a day to day phenomenon, ayurvedic texts have detailed information about its definition, types, and physiology and health benefits.^[7]

According to Charaka, when the mana including the indriyas is exhausted and they dissociate themselves from their objects, then the individual sleeps². The disturbance in Nidra might be related to the faulty life style, mental tension, changed food habits and stress which ultimately disturb the Nidra. Charaka has described Nidra among the primary tripod of life with its merits and demerits, classification and management. Ayu the individual life entity is considered as miniature replica of the universe. The Nidra is so important for maintenance of health. This is true in the light of modern scientific knowledge also. According to Ayurvedic concept, the Kapha and Tamas are responsible for Nidra. Sleep production has been attributed to many factors which include stimulation of certain areas of brain, food activities, external stimuli etc. Any variation in the normal sleep pattern is not at all desirable thing and they may cause the serious health problem which demand proper medical attention.^[21]

The regulation of sleep is processed by the homeostatic physiology of the circadian rhythm, the sleep/wake

cycle. Circadian rhythm is the 24-hour internal clock in our brain that regulates cycles of alertness and sleepiness by responding to light changes in our environment. As the day progresses and sunlight diminishes in the afternoon, melatonin production turns back on. Melatonin production peaks at night after the sun has gone down to help you fall asleep. Be careful, exposure to indoor lights and light from Smartphone's, tablets, computer screens, and TVs can interfere with melatonin production and disrupt your sleep.

MATERIAL AND METHODS

Etymological Derivation of the Word 'Nidra'

The word 'nidra' is derived from nind+ ruk+tap= na lopa.^[11]

The term 'Nidra' origine as —nindyate iti nidral (Sadbakalpadrumam).^[12]

Means that —Nothing loss is there. In Upanishads also explanation about Nidra is there. So that while explaining about diff. types of avastha, like Jagrutavastha, Swapnavastha, Sushiptavastha, and Trutiyavastha. Nidra is one among the Adharaniya vega which was explained by Charaka.^[3]

Synonyms

Samhita's	Synonyms
Amarkosha	Shayanam, Svapah, Svapnah, Samvesh
Vaidyaka Shabda Sindhu, ^[12]	Sambhashah, Suptih, Svapanam
Charaka Samhita ^[21]	Bhutadhatr
Sushruta Samhita ^[4]	Vaishnavi Maya

Definition

Samhita's	Definition
Charaka Samhita ^[1]	When the mind (as well as soul) gets exhausted or becomes inactive and the sensory and motor organs become inactive then the individual gets sleep.
Ashtanga Sangraha ^[8]	The Manovaha Strotas become accumulated with Shleshma and mind is devoid of sense organs because of fatigue, when individual falls asleep.
Sushruta Samhita ^[4]	The sleep occurs when the Hridaya the seat of Chetana is covered by Tamas.

Types of Sleep

Acharya charaka ^[1]	Acharya Sushruta ^[4]	Acharya Dalhana ^[5]	Acharya laghu vagbhatta ^[7]	Acharya Varidh Vagbhatta ^[8]
1. Tamobhava	1. Vaishnavi Nidra	Tamsik Nidra	Mithyayoga	1. Kalasvabhawajanya Nidra
2. Shleshma-samudbhava	2. Tamsi Nidra	Swabhaviki Nidra	Hinayoga	2. Aamayjanya Nidra
3. Manah-sharir-shrama-sambhava	3. Tamobhuyishtha Nidra	Vaikariki Nidra	Atiyoga	3. Chitta-khedajanya Nidra
4. Aagantuki	5. Satvabhuyishtha Nidra		Samyakyoga	5. Kaphajanya Nidra
5. Vyadhyanuvaritini	6. Vaikariki Nidra			6. Aagantu Nidra
6. Ratrisvabhava-prabhava				7. Tamobhava Nidra

Relation Between Age And Sleep.^[13]

Ages	Hours of sleep required
Birth to 1 month	18-20 hrs.
1-6 months	15-18 hrs.
6 months – 1 year	14-16 hrs.
1-2 yrs.	12-14 hrs.
2-5 yrs.	10-12 hrs.
5-16 yrs.	9-10 hrs.
Adults	8 hrs.
Old persons	4-6 hrs.

Relation Between Deha Prakriti And Sleep.^[1]

Vata prakriti	Pitta prakriti	Kapha prakriti
6-7 hours of sleep	7-8 hours of sleep	8-9 hours of sleep

Relation Between Manushik Prakriti and Sleep.^[13]

Sattvika prakriti	Rajasika prakriti	Tamasika prakriti
4-6 hours of sleep	8 hours of sleep	10-12 hours of sleep

Importance of Nidra

Acharya Charaka ^[1]	Acharya Sushruta ^[4]	Acharya Bhavamishra ^[10]	Acharya Vagbhata ^[8]	Acharya Kashyapa ^[14]
Sukha, dukha, pusti, karshya, bala, abala, vrushata, klibata, gnyanam, agnyana (ignorance), jivana and death all these occur depending on the proper or improper nidra ³⁹ .	Free from diseases, will have a pleasure in mind endowed with strength, color or complexion and virility ⁴⁰ .	When nidra is used after meal, it mitigates vata and pitta, while increases kapha. It status the body and brings comfort ⁴³ .	When nidra is observed judiciously, it will lead to happiness and long life just as the mind of the yogis become clear from knowledge of the soul and penance ⁴¹ .	Accepted that comfortable nidra is essential for milk production in mother ⁴⁴ .

Raatiri-Jaagran^[1]

Raatiri-jaagran indications	Raatiri-jaagran effect
a. Persons with kapha constitution and kaphaja disorders. b. Obese persons c. Persons who are poisoned d. 4) Persons taking diet rich in fat	a) Roughness in the body b) Increases vata and pitta c) Constipation d) Weakness e) Giddiness f) Lack of concentration g) Hyperacidity h) Burning of eyes, hands and feet

Divaswapna

Acharya's	Indications	Contra-indications
Charaka	1) People exhausted by singing, study, alcoholic, sexual acts, elimination therapy, carrying heavy weight, walking long distance. 2) Those suffering from phthisis, wasting, thirst, diarrhea, colic pain, dyspnea, hiccup, insanity 3) Those who are too old, too young, weak and emaciated. 4) Those who are injured by fall and assault, those who are exhausted by journey by a vehicle, vigil, anger, grief and fear. ^[1]	Persons with excessive fat, people who are addicted to taking unctuous substances, those with sleshmic constitution, those suffering from dushivisha. ^[1]
Sushruta	1) It is permissible for 48 minutes in case of children, aged, emaciated by sexual	Day-sleep is contra-indicated in all seasons except summers, in these too, it is permissible for a muhurt

	intercourse, wasted due to chest wound, alcoholic addicts 2) Those tired by riding, travelling in carriage or on foot and by hard work, those having not taken food 3) Suffering from deficiency of fat, sweat, kapha, rasa and blood and having indigestion. 4) Day-sleep is also desirable for half the normal period in case of those having awoken in night. ^[4]	(48minutes) in some cases mention under indications of sleep. ^[4]
Vagbhata	1) Persons who are exhausted by long speaking, riding on animals or vehicles, walking long distances by enjoying excess drinks, sexual intercourse 2) Lifting and carrying heavy weights, who are tired by anger, grief and fear. Who are afflicted by dyspnea, hiccup. Diarrhea. 3) Old, children, weak, emaciated, injured, thirsty, have pain, indigestion, are wounded and insane. 4) Those who are accustomed to daysleep. ^[8]	1) Persons who are very much fatty and have kapha-predominancy Who are habituated to oleation 2) Should not sleep during day time. ^[8]

Sleep and Biological Clock

When people talk about circadian rhythm, it's most often in the context of sleep. The sleep-wake cycle is one of the most clear and critical examples of the importance of circadian rhythms.

During the day, light exposure causes the master clock to send signals that generate alertness and help keep us awake and active. As night falls, the master clock initiates the production of melatonin, a hormone that promotes sleep, and then keeps transmitting signals that help us stay asleep through the night. In this way, our circadian rhythm aligns our sleep and wakefulness with day and night to create a stable cycle of restorative rest that enables increased daytime activity.^[11]

DISCUSSION

Now in modern text books scholars are more focusing over the water, food, sleep. But about this, before thousand years our Acharyas have told about Nidra and ahara under the heading of Trayopasthamba. As pillars support the house in the same way food, sleep, and sexual activities support the living body.^[7] In *Ayurveda*, all physiological and pathological phenomenons depend on delicate balance of *dosas* and to precisely regulate *dosic* biological clocks adjustments are made in the form of *dinacarya* and *ritucarya*. The concept of *ritucarya* implies dietetics, habits and behavioral adjustments to seasonal changes. *Ritucarya* aims at health maintenance in all seasons through a balanced state of *dosas* i.e. *dosas samya*. A balanced (and well adjusted) diet is the prerequisites for maintaining the optimum state of *dosas*. Dietary substances are chosen on the basis of complementarily, i.e dietary substance with properties similar to vitiated *dosas* are avoided while choosing the contrary. These *doshas* maintain our circadian body physiology i.e. early morning awaking, hunger, thirst, body vigor, slumber etc. Thus it can be concluded that

everybody has their own circadian rhythm or biological clock according which we work and any derangement in the homeostasis of *doshas* can alter this biological rhythm.

The pineal gland receives signals from the SCN and increases production of the hormone melatonin, which helps put you to sleep once the lights go down. Release of adenosine (a chemical by-product of cellular energy consumption) from cells in the basal forebrain and probably other regions supports your sleep drive. There are two internal biological mechanisms in body; Circadian rhythm and homeostasis which work together to regulate when you are awake and asleep. Now days one of the common problem for infertility is Nidra. The people now a days in their busy schedule are not having the proper time for food and sleep. Some people are having the duty at night time, and then they are not able to take sleep also. So that not getting sleep at day time, the persons are suffering from anxiety and other psychological problems which will leads to infertility.^[11] So our Acharyas have given importance to sleep as one of the pillar for life. sleep has its effect on human's physique as well. Ayurveda has given importance to nidra in order to gain or lose weight. Modern science claims that body repair mechanisms take place during sleep. As human growth hormone is released by brain stem in blood during sleep; it can be said that sleep promotes metabolism, enhances physical performance. Sleep is a state of consciousness that differs from alert, wakefulness, by a loss of critical reactivity to events in the environment with a profound alteration in the respiration etc.

CONCLUSION

On the basis of above description, it can be concluded that proper sleep at proper time is very essential for the growth and development of the body and mind. Sleep is

very necessary for the well-being of a person's life. Sleep is a state when both the mind and the body are at rest. By emphasizing an appropriate routine and timings of the day's natural cycle, we can promote the sleep state, and, in turn, promote health. Sleep plays a vital role in good health and well-being throughout your life. Getting enough quality sleep at the right times can help protect your mental health, quality of life and safety. - To combat the lifestyle disorders and lead a healthy life, ideal Nidra plays important role. It plays great role in prevention of the disease which are produced due to improper nidra. It promotes health when it is used as prescribed regimen. According to rules and regimen, nidra should be used and taken seriously. We must use nidra as a therapy in some diseases.

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