Review Article

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Sleep: Prime Essence of Life

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Abstract

Insomnia is highly prevalent and impairs cognitive and physical functioning of person. Irregular and impaired sleep patterns are reported to manifest many fatal diseases. Sleep, one among the three essential factors required for living as per ayurveda. Proper sleep leads to healthy and long life. Ancient *Acharyas* have stated that happiness and sorrow, growth and wasting, strength and weakness, virility and impotence and the knowledge and ignorance as well as the existence of life and its cessation depend on the patterns of sleep. Certain contemporary studies revalidated the concept laid down in classical literature about sleep. Seers emphasize sleep as an important factor for human life and put it under three sub-pillars of body which shows their deep knowledge of science. It is advisable to have good and sound sleep to maintain proper health.

Keywords: Sleep; *Nindra;* Non Communicable Diseases.

Introduction

Chronic insomnia is highly prevalent and affects approximately 30% of general population. Insomnia (inadequate quality and quantity of sleep) impairs cognitive and physical functioning and is associated with a wide range of impaired daytime functions across a number of emotional, social, and physical domains[1]. It may be a symptom of stressful lifestyle, depressive illness, anxiety disorders, certain psychiatric conditions or certain other pathological manifestations. Incidences are increasing day by day in developing countries like India, Nepal, Sri Lanka, Bangladesh etc. If left untreated; it may reduce mental capacity, efficacy, increases the chances of accidents and ultimately may drag the individual towards several psychosomatic disorders[2].

Ayurveda not only focuses on curing diseases but also emphasizes on preventing them. Emphasis has been laid down towards maintaining health in healthy individuals by means of different approaches. Certain activities under the heading of *Dinacharya*, *Ritucharya* are a few to refer in this regard. Impact of *Upastambha* (three sub- pillars) on health and diseases widely been discussed [3]. Sleep, one among the three is the essential factor required for living as that of food [4]. It affects body physically and mentally. Irregular and impaired sleep patterns are reported to manifest many fatal diseases. On the other hand, proper sleep that is followed by ayurveda guidelines lead to healthy and long life [5].

To precise, proper sleep is an indicator of good health. Sleep is also said to have effect over foetus. *Bhavamishra* has mentioned that during the pregnancy, when the mother sleeps, the foetus in the womb enjoys better rest and comfort [6].

While discussing about *Nidra (*sleep*);* ancient *Acharyas* have stated that happiness and sorrow, growth and wasting, strength and weakness, virility and impotence and the knowledge and ignorance as well as the existence of life and its cessation depend on the patterns of sleep [7].

Certain contemporary studies revalidated the concept laid down in classical literature about sleep. An attempt has been made to collect few such evidences that support ayurvedic concept of *Nindra*.

Sleep and Immunity

Bala (Immunity) of an individual improves with

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proper *Nindra*. It increases *Kapha* which is responsible for the strength and immunity of the body as well as mind. Physical health and immunity are promoted by *Sthirata* (stability), *Snigdhata* (unctuousness) and *Guruta* (heaviness) while mental health and immunity are promoted by *Kshama* (forgiveness), *Dhriti* (steadiness) and *Alobha* (contentment) which are the functions of *Kapha* in normal state.

Studies reported that sleep deprivation has an impact on the function of the human immune system and inadequate sleep increases the risk of cardiovascular diseases and type 2 diabetes [8].

Very robust changes are evident during the regular sleep–wake for immune parameters like leukocyte numbers, function, proliferation and cytokine production, manifest immunodeficiency characterised by an enhanced susceptibility to infections and a reduced immune response to vaccination [9]. Chronic sleep deprivation can be seen as an unspecific state of chronic stress, which per se impacts immune functions and general health [10,11].

Sleep and Growth Hormone

Sleep has been considered as nourishing factor as it promotes health by providing nourishment to the *Dhatus*. It has scientific correlation with normal secretion of growth hormones that maintain normal body functions.

The largest and most predictable GH peaks occurs about an hour after onset of sleep with plasma levels of 13 to 72 ng/mL [12]. Nearly 50% of GH secretion occurs during the third and fourth NREM (Non Rapid Eye Movement) sleep stages [13]. Peak of plasma GH, which followed the delayed onset of sleep was lower than that which occurred after the onset of sleep earlier in the night [10]. Sleep deprivation generally suppresses GH release, particularly after early adulthood [14].

Sleep and Memory

In classics, *Jnana* (memory) is said to be one of main function of *Kapha Dosha*. Normal sleep increases *Kapha Dosha* and promotes memory functions of brain [15].

Many research works prove role of sleep in normal functioning of brain and memory functions by modulating trace consolidation [16]. Sleep has been implicated in the plastic cerebral changes that underlie learning and memory. Reactivations of neuronal assemblies during sleep recently challenged by new environmental circumstances have been reported. These neuronal assemblies are proposed to be involved in the processing of memory traces during sleep [17]. In the initial stages of sleep, energy levels increase dramatically in brain regions found to be active during waking hours. Results suggest that a surge of cellular energy may replenish brain processes needed to function normally while awake [18]. Another study suggests that sleep-induced surge in ATP and the decrease in P-AMPK levels set the stage for increased anabolic processes during sleep and provide insight into the molecular events leading to the restorative biosynthetic processes occurring during sleep [19].

Sleep and Fertility

Fertility (*vrishta*) is one of the actions of *Kapha dosha* mentioned in classics. Proper sleep mitigates *Vata* and *Pitta* by increasing *Kapha*. *Prajagarana* (sitting for late hours) aggravates *vata* dosha and causes *dhatu kshaya*. In progressive stage, ultimately *shukra dhatu* gets decreased leading to infertility [20].

A strong evidence links daily wake-sleep cycles to feminine reproductive cycles. In human females, working night shifts and frequently travelling across time zones has been associated with menstrual irregularities, reduced fertility and a greater number of negative pregnancy outcomes such as low birth weight, preterm birth and miscarriage [21]. Studies also suggest that both male and female fertility health can be adversely affected by disrupted sleep patterns [22].

Diurnal Variation and Diseases

Diurnal variation like working in night hours may affect persons' health and it is due to disturbed circadian rhythm [23]. Gastrointestinal disorders like pain and alterations in bowel habits, especially constipation, diarrhoea and also peptic ulcer are more common in shift workers than in day workers [24, 25]. There is strong evidence in favour of an association between shift work and coronary heart disease. Studies concluded that shift workers had 40% excess risk for CVD compared with day workers [26, 27]. Shift work might have an impact on metabolic variables. Serum concentrations of potassium, uric acid, glucose, cholesterol and total lipids increase during night work. Night work is catabolic, which in turn could have a long-term cardio-vascular health effects [28]. There is an association between shift work and pregnancy outcome in terms of miscarriage [29], low birth weight [30] and preterm birth [31]. Hence, frequent diurnal variation and night sleep are against the nature.

Sleep Deprivation and Non-Communicable Diseases

It is also need of an hour to pay attention to sleep health in reducing global burden of NCDs [32]. Inadequate hours or disturbed sleep contribute to worsening atherosclerosis, hard cardiovascular endpoints, hypertension, diabetes and premature mortality[33-37]. Partial sleep deprivation for one night (3.6 hours of sleep) in healthy subjects increases blood pressure and sympathetic activity compared with a night of normal sleep duration [39]. Another study suggests that one night of sleep loss triggers a stress response that includes stimulation of both pro- and anti-inflammatory proteins [39]. Recent advancement in neurobiology have identified neural pathway such as the orexin system that contribute to regulartion of both sleep and weight. In addition chronically reduced sleep times are associated with obesity [40]. This fact is also mentioned by seers that obesity is depending upon diet as well as sleep also [4]. Sleep deprived subjects have daytime sleepiness and have a tendency to overeat and eat fast. Sleep disorders such as OSA(obstructive sleep apnea), insomnia, short or long-term sleep duration and restless legs syndrome are potential risk factors for insulin resistance, glucose intolerance, type 2 diabetes mellitus and metabolic syndrome [41].

Insomnia also leads to hallucinations, delirium and confusional states like that of dementia [42].

Consequences of Improper Sleep as Per Ayurveda

Seers emphasized on sleeping in night hours and to avoid in daytime. Alteration in this schedule may lead the manifestation of certain disease conditions like *Halimaka* (severe form of jaundice), *Shiroruja* (headache), *Jadya* and *Gaurava* (stiffness and heaviness in the body), *Jvara* (fever), *Bhrama* (giddiness), *Matibhramsha* (loss of mental activity), *Strotorodha* (obstruction of channels), *Agnimandya* (dyspepsia), *Shopha* (swelling), *Arochaka* (loss of appetite), *Hrillasa* (nausea), *Pinasa* (nasal catarrh), *Ardhavabhedaka* (hemicrania), *Kandu* (itching), *Ruja* (pain), *Kotha* (rashes), *Pitika* (eruptions), *Kasa* (cough), *Tandra* (stupor), *Kantharoga* (diseases of throat), *Vishavega pravriti* (quick development of the stages of poisoning) etc[43]. *Vata* gets vitiated with loss of sleep and causes the above symptoms along with generalized vague pain in the body, feeling of heaviness in the head, yawning, lazyness, tiredness, giddiness, indigestion, stupor [44].

Management as Per Ayurveda

If one keeps awake at night under unavoidable circumstances; should compensate by sleeping in the next morning, for half of that period (of lost sleep) without taking any food [45]. Such individuals preferable should use articles like milk, sugarcane juice, meat soup, eatables prepared from jaggery and flour; rice, wines, blackgram, skimmed buttermilk, curd of buffalo's milk in their meal.

Oil massage, bath, *Murdhataila* (Scalp massage with oils), *Karnapurana* (anointing ears), *Shirolepa* (medicinal plaster over the forehead), *Chakshustarpana* (application of soothing ointment to eyes), arrangement of proper bedding in a place with mild breeze and pleasant fragrance also induces good sleep [46].

Certain plants have been reported to be used in the treatment of insomnia like *Aparajita* (*Clitoria ternatea* Linn.), *Aragwadha* (*Cassia fistula* Linn.), *Ashwagandha* (*Withania somnifera* (Linn.) Dunal.), *Brahmi* (*Bacopa monnieri* Linn.), *Devadaru* (*Cedrus deodara* Roxb.), *Jatamansi* (*Nardostachys jatamansi* DC), *Jyotishmati* (*Celastrus paniculatus* Willd.), *Mandookaparni* (*Centella asiatica* Linn), *Musta (Cyperus rotundus* Linn.), *Priyangu* (*Aglaia diepenhorstii* Miq.), *Shallaki* (*Boswellia serrata* Roxb.), *Shankhapushpi* (*Convolvulus prostrates* Forssk.),*Tagara* (*Valeriana jatamansi* Jones.), *Vacha* (*Acorus calamus* Linn.) etc [47].

Conclusion

Sleep is an important consultant of life. Proper and adequate sleep is essential for normal body functioning. Inadequate sleep causes disturbance in physical and mental state of the body and mind and generate various pathological conditions. Sleep is normal function of the body which acts as physical and mental status of the person. Seers emphasize sleep as an important factor for human life and put it under three sub-pillars of body which shows their deep knowledge of science.

Conflict of Interest

Nil

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