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Review Article

DISTURB SLEEP IS A PATHOLOGICAL CONDITION THAT DISRUPTED THE HEALTH-AN AYURVEDIC APPROACH WITH CONTEMPORARY VIEW

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KEYWORDS: *Ayurveda*, *Anidra,* Sleep. Disturb sleep.

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ABSTRACT

Sleep is thought to have powerful restoratives properties. Sleep deprivation in human is widely believe to impact in health system, and is a well known risk factor for development of many diseases. All most all individual suffer from disturb sleep at least one occasion in his life time. Ayurveda describe sleep (*Nidra*) as a basic need like food and copulation. It is inevitable of all living being like death. *Anidra* (Disturb sleep) include any kind of abnormal sleep in respect of amount and quality in classical text of *Ayurveda*. *Anidra* has been described under the heading of causative factor, premonitory symptom, clinical feature, complication and bad prognostic sign of many diseases and as a disease itself in classical texts. Contemporary science also regarded disturb sleep is one of the pathological condition that distorted homeostasis. All major physiological systems affected by it. Disturb sleep alter the neurological, behavioral, metabolic as well as immune response. The circadian clock controls most hormone secretion and sleep has a major impact on it. Disturb sleep hampered the metabolism of many hormone and there secretions also. Sound sleep is a major criterion for maintenance of normal health. This review is try to illustrate how disturb sleep affect the health and its acute as well as chronic consequences.

INTRODUCTION

Sleep is defined as a natural periodic state of rest for the mind and body, in which the eyes usually closed and consciousness is partially lost. Sleep normally a period of relaxation and repaired, essential to maintain of physiological homeostasis and psychological balance. Disorders of sleep are common in Indian population. Between 8 to 15 percent of adult population have frequently and chronic complain about the quality and the amount of their sleep. The disturbances or shortening of normal sleep has recently been reported to manifest harmful effect to metabolic and endocrine function[1]. Recent biochemical and physiological studied have indicated that chronic sleep deprivation is an important factor in neurobehavioral, Cardiovascular, and metabolic morbidity developed in adult patients.[2] A considerable clinical evidence also suggest that insufficient sleep increases the risk of Hypertension, Atherosclerosis, and Insulin resistance as well as the stress induced remodelling of the brain regions that participate in the regulation of memory, executive function and anxiety.[3] Sleep deprivation result in an increase in plasma glucocorticoids in both human and rodents.[4] *Ayurveda* describe three most important biological factors maintains life process in human beings, designated as *Upasthambha* i.e., *Aahar*, *Nidra* and *Brahambhacharya*. Among them *Nidra* is one of the most important physiological basis to restore the biological integrity in human beings, and inversely it comes in to conclusion that disturb sleep (*Anidra)* is one of the undesirable condition that distorted the homeostasis.

Concept of *Nidra (*sleep*)* in *Ayurveda*

Nidra: The word is derived from *Nidikutsayam* means to abuse, to throw away [5]. When the *Mana* and *Indriya* (mind including sensory and motor organs) is exhausted and they dissociate themselves from their objects, then the individuals sleep.[6] When *Samjnavaha srotamsi* become involved with *Slesma* and dominated by *Tama gunas*, then sleep is manifested. *Satva guna* is the cause for waking. *Nidra* is *Vaisnavi* i.e. related to *Visnu*, it is sinful and encroaches upon all living beings by nature.[7]

Involve *Dosha*, *Dushya* in the physiology of *Nidra*[7]

Sharir Dohsa – Kapha
Manas Dohsa – Tama
Dushya – Mana
Srota – Samjnavaha Srotamsi
Sroto dusti – Srotaborodha

Synonyms: [8] *Nidra*, *Sayanam*, *Swapa*, *Sushupti*, *Swapna*.

Classification of *Nidra*: *Nidra* is of the following seven types.

(1) *Tamobhaba* (caused by *Tamas*)
(2) *Sleshmasamudhbhaba* (caused by *Kapha*)
(3) *Mono sroma sambhaba* (caused by mental exertion)

(4) *Shorir sroma sambhaba* (caused by Physical exertion)
(5) *Agantuka* (indicative of bad prognosis leading to imminent death).
(6) *Vyadhanubhartini* (Complication of other diseases)
(7) *Ratriswabhava* (Physiological night sleep)[9]

Other view, *Nidra* is three kinds viz.

(1) *Tamasi* – when *Samjnavaha srotamsi* become filled with *Sleshma* and dominated by *Tama guna* then sleep known as *Tamasi*, from which persons cannot be awakened. This occurs at the time of death.

(2) *Svabhaviki* – occurring daily for every person.

(3) Vaikariki – persons in whom *Sleshma* has decreased and *Anila* (*Vata*) has increased, and in those whose mind and body are in trouble by disease. It does not appear at all any time. This is *Vaikariki* (abnormal).[10] The *Nidra* is an important psycho physiological states of human being.[11]

In modern science *Tamasi*, *Swabhavika* and *Vaikarika nidra* can be understood as coma, natural sleep, and insomnia respectively.

Effect of *Nidra* (sleep)

(1) Happiness, misery, nourishment, emaciation, strength, weakness, virility, Sterility, knowledge, ignorance, life and death – all these occur depending on the proper or improper sleep. Like the night of distractions (*Kalratri*) untimely and excessive sleep and prolonged vigil take away both happiness and longevity. The same sleep, if properly enjoyed brings about happiness and longevity in human beings or the real knowledge brings about *Siddhi* (spiritual power) in a *Yogin*.[12]

(2) Avoidance of sleep and initiation actions like sleeping with a sense of recollection of the nature of his own soul is the way of salvation.[13]

(3) Proper sleep and proper awakening is the part of daily *Rasayana*.[14]

(4) Avoidance of excessive sleep and awakening is advised in *Sadvritta (*good conduct*)* for maintenances of healthy life.[15]

(5) Like proper diet, proper sleep is also essential for the maintenance of the body corpulence and emaciation and specially conditioned by proper or improper sleep and diet.[16]

(6) Regimen of *Nidra* according to seasons -Sleeping during day is prohibited in all seasons except summer – Good sound sleep at night is advised for all seasons.[17]

Indication and contraindication of *Nidra*

Nidra depends upon the nature of the individuals and time, seasons. The Night sleep is per excellence. This is known a *Bhutadhatri* i.e. that nurses all the living beings. This one caused by *Tamas,* is the cause of all sinful acts. The remaining types are treated as diseases. Sleeping during day is prohibited in all seasons except summer. There are so many conditions and contraindication of day sleep. Day sleep aggravates *Kapha-pitta* [18] or all *Dosas*[19]. Those who are habituated to either day sleep or keeping awake at night such sleep and wakefulness do not cause any harm to them.

Impact of *Manas dosa* in *Nidra*

Sleep manifests naturally in persons with predominance of *Tamoguna* both during day and night. With predominance of *Raja Guna*, it occurs without any reason at any time. With predominance of *Satvaguna*, it occurs at midnights.[19]

Impact of *Sharir dosa* in *Nidra*- Sleeplessness is the clinical feature of aggravation of *Vayu* while excessive sleepiness is concerned with aggravation of *Kapha*. *Alpanidrota* is related to *Pitta* aggravation.[20]

***Nidra* (sleep) as a Natural Disease *(Swabhava bala pravritta Vyadhi)* -** Those produced by naturally, and it is inevitable, it cannot prevent, like others Diseases such as hunger thirst, old age, death, sleep.[21]

Sleep as a part of *Tryo Upastambhas* (Secondary supports) The three supports of life are intake of food, sleep and *Brahmacarya* (control of senses and spiritual bliss conducive to the knowledge of *Brahman*). Being supported by these, three well regulated factors of life, the body is endowed with strength, complexion and growth, continuance till the full life.[22]

Condition of heart (*Hridaya)* during sleep

Hridaya, similar to *Pundarika* (lotus bud) is facing downwards; it opens when the person is awake and closes when he is asleep.[23]

Concept of *Anidra*: It is the pathological condition of *Nidra* (natural sleep).An aggravated condition of bodily *Vayu* or *Pitta*, or enfeebled *Kapha*, an aggravated state of the mind, loss of vital fluid and a hurt or an injury may bring on *Anidra*. *Anidra* or sleeplessness or disturbed sleep is a condition that often causes annoyance, and by depriving the person of his natural rest, result in interference with activity during the day. When it becomes a habit, it may pose a serious menace to health. Excessive sleep, prolong sleep, untimely sleep as *Kal-ratri*.[24]

Causes of *Anidra (*insomnia*)*- Physical factors[25]

Elimination of *Doshas* from the body and head through purgation and emesis, fear, anxiety, anger, smoke, physical exercise bloodletting, fasting, smoke, uncomfortable bed, over work, old age diseases, specially these due to the vitiation of *Vata* like colic pain etc.

Psychological causes – Anxiety, anger, predominance of *Sattva* and suppression of *Tamas* are known to cause of insomnia. Some are insomnia even by nature. [25].Loss of sleep is caused by aggravation of *Anil* (*Vata*) and *Pitta*, exhaustions of the mind, loss of tissues and injury to the body.[26]

Methods and measures to induce good sleep

Sleeplessness should be treated by massage, bath, and intake of soup of domestic marshy and aquatic animals, *Sali* rice, with curd, milk (especially Buffalo milk), unctuous substance, and alcohol, psychic pleasures, smell of scents and hearing of music of owns choice. *Samvahana* (rubbing the body by hand), application of soothing ointment to the eyes, head, face, comfortable bed and home and proper time.[27] For loss of sleep, anointing the body, oiling the head, massaging and oiling the head, massaging and trampling over the body are beneficial. Use of rice, wheat, flour of grains eatables prepared from sugar cane juice is ideal food. Such food being sweat in taste, unctuous, use along with milk and soup of meat etc. soup of meat of animals which live in burrows and of *Viskira* birds, *Draksa*, Sugar and

products of Sugarcane juice should be used at night. Cot, seats and vehicles should be pleasant and soft any other thing which bestows sleep may be adopted by the intelligent person. [28]

Indication of day sleep

Sleeping during the day time in all seasons is prescribed for those who are exhausted by singing, study, alcoholic, sexual acts elimination therapy, carrying heavy weight, walking long distance those suffering from phthisis, wasting, thirst, diarrhoea, colic pain, dyspnoea, hiccup, insanity, those who are too old, too young, weak and emaciated, those injured by fall and assault those exhausted by journey by a vehicle, vigil, anger, grief and fear and those who are accustomed to day sleep. By this equilibrium of *Dhatu* and strength are maintained and the *Kapha* nourishes the organ and ensure longevity.

In summer season night become shorter and *Vata* gets aggravated in the body due to absorption of fluid (*Adana*). Therefore, during this season, sleep during day time is advised for all.[29] *Unmad*, *Atisara*, *Vaman*, *Krodha*, *Ajeerna*, *Visuchika* are indicated condition for day sleep.[30]

Contraindication of day sleeps

Sleeping during the day time causes vitiation of *Kapha* and *Pitta*. Fatty persons those who are taking fatty substance, *Slaismika* constitution, those suffering from *Kaphaja* diseases and *Dusivisa* (artificial poisoning) should never sleep during day time.[31]

Diseases due to day sleep

Patients may suffer from following type of diseases due to day sleep. They are *Halimaka*, headache, laziness, heaviness of the body, malaise, loss of digestive power, *Hridayaprolepa*, edema, anorexia, nausea, rhinitis, hemicranias, urticaria, eruption, abscess, purities, drowsiness, cough, diseases of the throat, impairment of the memory and intelligence, obstruction of the circulating channels, fever, weakness of sensory and motor organ, enhancement of the toxic effect of artificial poisons.[32] Day sleep is definitely abnormal, it aggravates all the *Doshas*. From such aggravation cough, respiratory distress, nasal catarrhal, feeling of heaviness of head, body ache, anorexia, fever and weakness of digestive fire developed. [33]

Effect of Night awakening

Night awakening causes roughness in the body, sleep during day time causes unctuousness and dosing in sitting posture does neither causes roughness nor unctuousness.[34]

Concept of sleep

Sleep is defined as unconsciousness from which the person can be aroused by sensory or other stimuli sleep is normally a period of relaxation and repair essential for the maintenance of physiological homeostasis and psychological balance. It is a biological need that should be fulfilled satisfactory. Sleeping is often over looked as just a means of rest when we are tried but there is a lot that goes on biologically. [35]

Neuroanatomy of sleep

Sleep and sleep pattern can be produced by the medullary reticular formation, the thalamus and the basal forebrain. While the brainstem reticular formation, the midbrain, the sub thalamus and the basal forebrain have all been suggested to play a role in the generation of wakefulness or EEG arousal. Sleep and wakefulness is distributed along an axial 'core' of neurons extending from the brainstem rostrally to the basal forebrain. A cluster of r-amino butyric acid (GABA) and galaninergic neurons in the ventro lateral pre optic (VLPO) hypothalamus is selectively activated with sleep onset and inhibits multiple distinct wakefulness centers, indicating that the hypothalamic VLPO neurons play a key role in sleep regulation. The mid line thalamic neurons are hyperpolarized and discharge on sleep spindle during slow wave sleep but in case be shifted from hyperpolarized phase firing to depolarized tonic by sensory stimulation that produces arousal.[36]

Neurochemistry of sleep

Early experimental studies that focused on the rephenuclei of the brain stem appeared to implicate serotonin as the primary sleep-promoting neurotransmitter, while catecholamine considered responsible for wakefulness. Pharmacological studies suggest that histamine, acetylcholine, dopamine, nor adrenalines are all involved in wake promotion. Pontine cholinergic neurotransmission is known to play a role in REM sleep generation. GABA receptor complex has a role on sleep. Neuropeptide, hypo cretin (Orexin) has recently implicated in the patho physiology of narcolepsy but its role in normal sleep remains to be defined. A variety of sleep-promoting substances have been identified. These include prostaglandin D2, delta sleep-inducing peptide, muramyl dipeptide, interleukin, fatty acid primary amides and melatonin. The hypnotic effect of these substances is commonly limited to NREM sleep. Prostaglandin and interleukin- 1 are immunologically active, suggesting a link between immune function and sleep wake states. The concentration of adenosine changes in some sleep areas during caffeine implicates adenosine. Ritanserin, Serotonin antagonist, increase NREM sleep. Barbiturates decrease the REM sleep.[36]

Organization of Human Sleep

Normal nocturnal sleep in adult displays a consistent organization from night to night. After sleep onset, sleep usually progresses through NREM Stages 1 – 4 within 45 -60 min. Slow wave sleep (NREM Stages 3 and 4) predominates in the first third of the night and comprises 15 – 25% of total nocturnal sleep. The percentage of slow wave sleep is influenced by several factors most notably age. Prior sleep deprivation increases the rapidity of onset and both the intensity and amount of slow wave sleep. The first REM sleep episode usually occurs in the second hour of sleep. NREM and REM alternate through the night with an average period of 90- 110 min (The "ultradian" sleep cycle). Over REM Sleep constitutes 20 – 25% of total sleep and NREM Stages 1 and 2 are 50 – 60%. There is less stage 3 and 4 and more REM Sleep to word morning. Thus 4 -6 REM periods occur per night lasting 5-30 mins. NREM Sleep is divided into four Stages.

Stage 1: A person falling asleep first enters stage 1 which is characterized by low amplitude high frequency EEG activity.

Stage 2: It is marked by the appearance of Sleep spindles. These are bursts of alpha like (10 – 14 Hz), 50 v waves.

Stage 3: The pattern is lower frequency and increased amplitude of EEG wave.

Stage 4: Maximum slowing with large waves. Thus the deep sleep is pattern of rhythmic slow waves, indicating marked synchronization. Most sleep during each night is of slow wave variety. This is deep, restful sleep that the person experiences during the first hour of sleep.[36]

Circadian Rhymicity of Sleep

The sleep-wake cycle is the most evident of the many 24-hrs rhythms in humans. Small difference in circadian period underlie variations in diurnal preference, with the circadian period shorter in individuals who typically rise early composed to those who typically go to bed late. The timing and internal architecture of sleep are directly coupled to the endogenous circadian pacemaker. Paradoxically circadian rhythms of sleep tendency, sleepiness and REM sleep propensity all peak near the habitual wake time just after the circadian temperature cycles whereas the circadian wake propensity rhythm peaks 1-3h before the habitual bed time. These rhythms are thus timed to oppose the homeostatic decline of sleep tendency during the habitual sleep episode and the rise of sleep tendency throughout, the usual waking day respectively. [36]

Physiologic functions of Sleep

All major physiologic system influenced by Sleep. Cardio-vascular function includes a decrease in blood pressure and heart rate during NREM and slow wave sleep. While it has become irregular, this is characteristic of the REM sleep indicating dream state, principally mediated by the vagus. Cardiac dysrhythmias may occur during REM Sleep Respiratory rate becomes more regular during NREM Sleep and becomes very irregular during phasic REM sleep. Decrease in Basal metabolic rate at sleep onset, resulting in higher Pco2.Peripheral muscle tone is exceedingly depressed. Irregular muscles movements occur, including rapid eye movement in REM sleep. Erection occurs in males. The brain is highly active in REM sleep. Brain metabolism increased as much as 20%. Slow-wave sleep is associated with secretion of growth hormone. Peak level of growth hormone occurred about 70 min after initiation of Sleep. There are six differences in secretion of Growth hormone. 60 – 70% of GH secretion occurs at initiation of sleep in men. By contrast, more numerous daytime pulses of GH occur in women. The plasma prolectin level augmented during sleep. The rise starting after the onset of sleep and persisting throughout the sleep period. Sleep has a complex effect on Luteinizing hormone (LH) secretion. During puberty sleep is increased LH secretion. Whereas sleep in the post pubertal female inhibits LH secretion. Slow wave sleep is associated with inhibition of thyroid- stimulating hormone (TSH) and adrenocorticotrophic hormone- cortisol axis, an effect on the circadian rhythm. Thyroid hormone influence the brain's sleep related structure.

The pineal hormone melatonin is secreted at night in both day and night active species. Sleep restores normal level of brain activity and normal balance of the central nervous system, neural maturation. Sleep is necessary for facilitation of learning, memory, cognition and through process. NREM sleep is associated with an alteration of thermoregulatory response to either heat or cold stress but REM sleep complete absence of thermo-regulatory responsiveness. Normal sleep increases gastric acid secretion.[36]

Age related disturbed Sleep

Age has a profound impact on sleep stage organization. Slow wave sleep is most intense and prominent during childhood, decreasing sharply at puberty. After age 30, there is a progressive decline in the amount of slow-wave sleep. In healthy older person slow-wave may be completely absent, particularly in male. In infancy, REM sleep may comprise 50% of total sleep. The percentage is inversely proportional to developmental age. A many on 50% of older individual complain disturbed or light sleep, frequent awakening, early morning awakening, undesired day time sleepiness, frequent interruption of sleep by long periods of wakefulness, possibly an age dependent intrinsic lightening of sleep homoeostatic process or may be sensitive to environmental stimuli. At least some sleep disturbance seen in older adult, apparently independent of medical or psychiatric illness or often referred as 'age related sleep changes'. Men but5 not women tends to poorer sleep with age.[36]

Concept of disturb sleep

Disturbed sleep include insomnia (an inability to fall asleep or to stay asleep as long as desired) dyssomnia (any disturbance or difficulty related to sleep including initiating or maintaining, quality, amount or timing of sleep). Parasomnia (undesirable event that occur during entry into sleep, within sleep or during sleep and other sleep disorder.[35]

Systemic Effect on disturb Sleep -

1. Psychological or behavioral intervention of disturb Sleep

Disruption to normal sleep can have serious effect on cognitive function, emotional regulation, physical and mental tiredness, poor concentration irritation, highly impairment in social and occupational day time function, increase risk of motor vehicles accident etc. If we don't get enough sleep, we are increasingly prone to stress sickness depression, poor job performance and reduce productivity. There is gap between attention span and reaction time, impaired judgments learning sessions do not improve until a period of slow-wave plus REM sleep has occurred.

Prolonged wakefulness is associated with progressive malfunction of thought process and abnormal behaviors even psychotic, poor executive dysfunction (e.g. Organization, planning, multitasks).[37]

2. Neurological effect of disturb sleep

Lack of sleep affect the function of central nervous system, neural maturation, aggravated peripheral neuropathy, chronic insomnia are the leading cause of hypothalamic disorder. Activity of sympathetic nervous system was increased with sleep deprivation.[37]

3. Endocrinal changes due to disturb Sleep

Most hormone secretion is controlled by the circadian clock and sleep has a major impact on it. Disturb sleep-altered metabolism of glucose with insulin resistant pattern diabetes. Plasma progesterone, estradial level are decreased while stress hormone corticosterone level are found to increased. Thyroid hormone influenced the brain's sleep related structure and sleep deprivation leads to may disorder like hypothyrodism, sleep apnoea etc. low level of Serotonin affects the mood. Low level of leptin hormone (apposite inhibitor), highly level of ghrelin hormone (Stimulates hunger) resulting weight gain. All hormone enzymes, neurotransmitters sex steroid are altered their function.[38]

4. Genetic and immunologic aspect of disturb Sleep

IL6, IL8, IL15, and IL18 are all Non REM Sleep, C-reactive protein and tumour necrosis factor, alpha-prostaglandin D2, delta sleep inducing peptide, muramyl peptides. Growth hormone releasing hormone factor, opiate peptides have all been implicated in NREM sleep regulation and link between immune function and sleep wake states. Sleep deprivation delayed repair damage of all or tissue; aggravate disease as damage accumulation, lowered immunity, toxin build up, slower healing. Certain cancers, including prostate, breast, endometrial, colectoral are related to sleep deprivation.[39]

5. Effect on Gastro-intestinal tract

Long term sleep disturbance are more susceptible to gastric upset, irregular bowel syndrome, dyspepsia, constipation, peptic ulcer, desynchronisation of meal time and gastrointestinal phases, irritable bowel syndrome etc. Shift workers mostly suffer from above diseases. Gastric discomfort of duodenal ulcer patients can be attributed to acid hyper secretion on REM Sleep. Sleep deprivation as a stress lowering the gastric mucosal barrier is able to stimulate the heat shock protein 70, and three fold increased in Basal acid output (BAO) but the pangastrin-stimulated acid output (MAO Pg) was unchanged. The human pancreatic polypeptide level is increased two fold after sleep deprivation. [39]

6. Cardio-vascular changes

Sleep deprivation is the leading cause of high blood pressure. Sleep apnoea related sleep disturbance associated with surges in blood pressure, which may increases the risk of hypertension, Coronary event and stroke. Heart rate become irregular and cardiac arrhythmia may occur in the dream state. Chronic sleep deprivation may cause heart disease. [40]

7. Effect on Reproductive System

Regular disruption of sleep can contribute towards disorder of the reproductive system and affects both sexes. It can increase miscarriage risk. Sex drives diminish – men are more exhausted prone to erectile dysfunction, women experience vaginal dryness. Relation difficulties are common when one partner is suffering sleep loss. Women's menstrual cycles & are influenced to circadian rhythms and is very sensitive to sleep patterns. It includes increased or decreased flow, irregular cycles, mixed period, shortening or lengthening of flow, increased pain, and irregular ovulation. In addition to above factors, overweight, chronic stresses, P.C.O.S, insulin resistance are responsible for infertility. [41]

8. Effect on Musculo-skeletal system

Multiple regional musculo skeletal pain and disability associated sleep abnormality. Inadequate night time sleep related to fatigue, malaise, muscles cramp etc. [42]

9. Effect on Respiratory System

During Sleep the respiratory rate remains same as during wakeful states at rest. But the Tidal volume reduces. Sleep deprivation not so effect on respiratory system. [42]

10. Effect on Skin

Sleep deprivation has been show to induced typical dermatitis; severe ulcerative and hyperkeratosis skin lesions may develop. The mucosal epithelial cell proliferation was also suppressed by sleep deprivation. [43]

11. Body Weight change

Experimental animals completely deprived of REM sleep long periods. Shows lose weight in spite of increased calorie intake. Exposure to sleep deprivation had a long lasting impact was on tissue weight. There was a decrease hemi lateral epididymal fat weight in mature animal. Chronic sleep disturbance leads to weight gain due to, low level of leptin hormone (appetite inhibitor) high level of ghrelin hormone (Stimulates hunger) and insulin resistance [43].

12. Bio-chemical changes in Disturbed sleep

Sleep deprivation alters the oxidative metabolic process, conversion of metabolic energy in adult Neurotrammiter (like serotonin melatonin, adenosine) in the brain become altered. Homocysterine concentration increased and decreased super oxide dismutage activity. The homocysteine changes detected in the sleep deprivation contribute to redox changes, controlling gene expression and shaping epigenetic development. All enzyme, hormone altered their bio-availibity with chronic sleep disturbance.[44]

Discussion and conclusion

Sleep is thought to have powerful restoratives properties. Sleep deprivation in human is widely believe to impact in health system, and is a well known risk factor for development of many diseases. The physical and biochemical changes produced by sleep deprivation that results in health consequences and largely unknown. Increase generation of oxidative free radicals or impaired anti oxidant defense mechanism have been implicated in chronic sleep deprivation induced disturbed homeostasis including Immunosuppression, Diabetes mellitus, Acid peptic disorder, Atherosclerosis, Cognitive dysfunction etc.[45] Sleep comes under non-suppressive urges. Clinical feature for its suppression are too much yawning, Malaise, Dizziness, diseases of head, heaviness of eye[46], giddiness, indigestion, stupor, and disease of *Vata* origin also found.[47] Sleeplessness (*Nidranash* or *Aswapna* or *Anidra*) is the causative factor of *Atikrisa* (emaciation)[48]. It is a clinical feature of *Vata-Pitta Jwara*, *Sannipat Jwara*[49] *Gulma* (In the process of Suppurations) [50], *Tamak Swas*[51], *Sannipatik atisar*[52], *PittajaVisarpa*, *Vata-Pitta Visarpa*[53], *Vataja Trisna*[54], *Asthi Majja gata*

Vata[55]. *Anidra* is the complication of *Vatarakta*[56], Excess *Vaman* and Excess *Virachana*[57]. When the life span comes to an end, the person either sleeps always or does not get sleep at all.[58] *Anidra* is the feature of earache; prodromal feature of diarrhea. Feature of alcohol intoxication; insect bite; inadequate and excess application of enema. *Rebati Graha*, puerperal disorder.[59] *Aswapna* i.e. insomnia is under *Vataja namatmaja* disease while excessive sleep (*Atinidra*) is included under *Kaphaja nanatmaja* disease.[60] *Vata* aggravation concern with *Nidranash* (insomnia), whereas *Pitta* aggravation responsible for *Alpa-nidrota*, and *Kapha* for *Atinidra* (excessive sleep).[61]

From overall review it concludes that *Anidra* include any type of abnormal sleep that means inadequate, improper, untimely sleep, and it is one of the pathological conditions that disrupted the homeostasis. All most every system affected by it. Inversely sleep is the key factor for *Arogya* (health) just after food.

REFERENCES

1. Anderson ML, Mortins PJ, Almedia VD, Bignotto M, Endocrinological and Catacholominergic alterations during sleep deprivation and recovery in male rats, J. Sleep Res. 2005 ;14 :83-96.
2. Copinschi Kheirandish and Gozal, Thase, Sleep deprivation and health consequence, New York, 2006.p-1-6.
3. Rechtschaffen A, Bergmann BM, Everson CA, Gulliland MA. Sleep deprivationin the rat :X integration and discussion of the findings. Sleep 2002 ;25 :68-87.
4. Rechtschaffen A, Bergmann BM, Everson CA, Gulliland MA. Sleep deprivation in the rat: X integration and discussion of the findings. Sleep 2002; 25:68-87.
5. Rao SK Ramcharan, Enclycopedia of Indian Medicine (Basic Concept) Popular prokasana, Bombay, 2nd vol, 1987, p-130.
6. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutrasthan, 21th chapter, verse-25, Chaukhambh Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-380.
7. Bhisagratna KL, Susruta Samhita, Sarir Sthan, 4th chapter, verse-33, Chaukhambha Sanskrit Series office, Varanasi, 1st vol, 1981.p-63.
8. Bhisagratna KL, Susruta Samhita, Uttoatantra, 5th chapter, verse-55, Chaukhambha Sanskrit Series office, Varanasi, 3rd Edition, 1st vol, 1981.p-67.
9. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutrasthan, 21st chapter, verse-58, Chaukhambh Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-385.
10. Bhisagratna KL, Susruta Samhita, Sarir Sthan, 4th chapter, verse-33, Chaukhambha Sanskrit Series office, Varanasi, 3rd Edition, 1st vol, 1981.p-63
11. Mishra YK, Padartha Vijnana, Chaukhambha Sanskrit Sansthan, Varanasi, 1st Edition, 1st vol, 1912.p-541.
12. Sharma Ram Karan and Dash Bhagawan., Carak Samhita, Sutrasthan, chapter 21st, verse-36-38, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-381.
13. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sarir sthan, 5th chapter, verse-12, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-420.
14. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsa sthan, 1st chapter, verse-32, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 3rd vol, p-13.
15. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 8th chapter, verse-19, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-173.
16. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21st chapter, verse-4, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-375.
17. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21st chapter, verse-42, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-382.
18. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21st chapter, verse-25, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-379.
19. Murthy.K.R.Srikantha, Susruta Samhita, Sarir Sthan, 4th chapter, verse-33, Chaukhambha Orientalia, Varanasi, Reprint Edition 2010, 1st vol, p-63.
20. Murthy.K.R.Srikantha, Susruta Samhita, Sutra Sthan, 15th chapter, verse-13, Chaukhambha Orientalia, Varanasi, Reprint Edition 2014, 1st vol, p-102.
21. Murthy.K.R.Srikantha, Susruta Samhita, Sutra sthan, 24th chapter, verse-7, Chaukhambha Orientalia, Varanasi, Reprint Edition2014, 1st vol, p-178.
22. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra sthan, 11st chapter, verse-35, Chaukhambha Orientalia, Varanasi, Reprint 2014, 1st vol, p-219.
23. Murthy.K.R.Srikantha, Susruta Samhita, Sarirsthan, 4th chapter, verse-32-36, Chaukhambha Orientalia, Varanasi, Reprint Edition2014, 1st vol, p-61-64.
24. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra sthan, 21st chapter, verse-37, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-381.
25. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21st chapter, verse-55-57, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-383.
26. Murthy.K.R.Srikantha, Susruta Samhita, Sarir Sthan, 4th chapter, verse-52, Chaukhambha Orientalia, Varanasi, Reprint Edition2014, 1st vol, p-65.
27. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21th chapter, verse-52-54, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-382.
28. Murthy.K.R.Srikantha, Susruta Samhita, Sarir Sthan, 4th chapter 4th, verse-53-56, Chaukhambha Orientalia, Varanasi, Reprint 2014, 1st vol, p-65.
29. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsa sthan, 21th chapter, verse-25, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-379.
30. Sastri R, Harit Samhita, Sarir Sthan, 3rd part, verse-33-35, Prachya Prokasana, Varanasi, 1st vol, 1st Edition, 1985, p-132.
31. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21th chapter, verse-52-54,

Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-384.
32. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21th chapter, verse-46-48, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-383.
33. Murthy.K.R.Srikantha, Susruta Samhita, Sarir Sthan, 4th chapter, verse-36, Chaukhambha Orientalia, Varanasi, Reprint Edition2014, 1st vol, p-64.
34. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutra Sthan, 21th chapter, verse-50, Chaukhambha Sanskrit Series Office, Varanasi, Reprint2014, 1st vol, p-384.
35. Guyton and Hall, Text Book of Medical Physiology, Elsevier India Private Limited. Haryana, 12th Edition, 2011, p-712-725.
36. Harrison"s, Principal of Internal Medicine, The Mc Graw Hill Companies Inc. New Delhi, 17th Edition, 1st vol, 2008, p-171-180.
37. Van Houdenhove L, and Von Den Bergh O, Cognitive behavioral changes for primary insomnia, Tijdschr Psychiatry, 2010; 52(2):79-88.
38. Everson CA, and Reed HL. Pituitary and peripheral hormone response during sustained sleep deprivation in freely moving rats. Endocrinology, 1995; 136:1426-1434.
39. Thorpy M, Managing the patient with Sleep disruption and Shift Work disorder, The Journal of Family Practice, 2010; 59(1):24-31.
40. Szymusiak R, and Gersh BJ and Somers VK. Obarstulr active sleep apnea implication for cardiac and vascular disease. JAMA, 2003; 290:1906-1914.
41. Miller Blake, Sleep-The key to conceiving, Fertility Health, Jan 28th, 2009.50:30-37.
42. Harrison"s, Principal of Internal Medicine, The Mc Graw Hill Companies Inc. New Delhi, 17th Edition, 1st vol, 2008, p-171-180.
43. Thorpy M, Managing the patient with Sleep disruption and Shift Work disorder, The Journal of Family Practice, 2010; 59(1):24-31.
44. Anderson ML, Mortins PJE, Santosh RE, Tufik S, Effect of paradoxical sleep deprivation on oxidative stress, Experimental Gerontol, 2004; 39:817-824.
45. Droge W, Free radical in the physiological control of cell function. Physiol Rev 2002 ;82 :47-95.
46. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutrasthan, 7th chapter, verse-23, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-151.
47. Murthy, K.R, Srikanta, Astanga Hridaya, Sutrasthan, 7th chapter, verse-64, Krishna Das Academy, Varanasi, 2nd Edition, 1994, p-1198
48. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutrasthan, 21th chapter, verse 4-12, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-377.
49. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 3rd chapter, verse-103, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-138.
50. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 5th chapter, verse-41, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-265.
51. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 17th chapter, verse-59, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 4th vol, p-131.
52. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 19th chapter, verse-8, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 4th vol, p-211.
53. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 21th chapter, verse-33-39, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 4th vol, p-274.
54. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 22nd chapter, verse-22, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 4th vol, p-309.
55. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 28th chapter, verse-33, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 5th vol, p-29.
56. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Chikitsasthan, 29th chapter, verse-6, 31, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 5th vol, p-88.
57. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Siddhisthan, 1st chapter, verse- 17, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 6th vol, p-105.
58. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Indriyasthan, 11th chapter, verse-24, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 2nd vol, p-581.
59. Tweari P.V, Kashyap Samhita, Chaukhambha Viswabharati Oriental Publishers, Varanasi, 1st Edition, 1996.p-53, 54, 57, 68, 171, 291, 536.
60. Sharma Ram Karan and Dash Bhagawan, Carak Samhita, Sutrasthan, 20th chapter, verse-11, Chaukhambha Sanskrit Series Office, Varanasi, Reprint 2014, 1st vol, p-363.
61. Murthy.K.R.Srikantha, Susruta Samhita, Sutrasthan, chapter 15th, verse-18, Chaukhambha Sanskrit Series office, Varanasi, Reprint 2014, 1st vol, p-105.

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