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Ayurveda

A CONCEPTUAL STUDY ON *NIDRA* AS *ADHARNIYA VEGA* WITH SPECIAL REFERENCE TO SHIFT WORK SLEEP DISORDER

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ABSTRACT The ultimate motto of *Ayurveda* is to achieve health of mortal. *Nidra* is one of the most important dimensions of health associated with happiness. It is essential phenomenon for maintenance and restoration of both body and mind. Man of this techno-world is trying to get overcome such harmonious features by elaborating his mental dimensions. But, the biological clock which is mandatory for the well being of life's rhythm is not ready to recognize these upsetting created by him. Once this harmony is violated his 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. If lack of sleep is occurred due to shift work sleep disorder(S.W.S.D.) it will cause symptoms of insomnia in association with gastro-intestinal disorders, cardiovascular diseases, metabolic disorders, immunity disorders, cancer and reproductive issues. *Ayurveda acharyas* have long ago identified the negative consequences of night awakening in the context of *Adharniya Vegas* which causes drowsiness, headache, heaviness in the eyes, etc. These symptoms are similar with the symptoms of sleep work disorders. So, in present article it is an attempt to correlate concept of *Nidra* as *Adharniya Vega* with shift work sleep disorder.

KEYWORDS : *Adharniya Vega, Nidra* , Shift work sleep disorder, Circadian Rhythm

INTRODUCTION

Ayurveda is a practical science that deals with physiological and pathological status of human mortal. It has recognized *Nidra* as one of the most important dimensions of health associated with happiness and is an outcome of relaxed mental state. Restful sleep provides the basis for physical, mental and psychological well being in humans[1]. So, restorative sleep is the primitive need of human existence and hence duly acknowledge as one among 3 forces (*Tryopasthabha)*[2] to sustain life *Aacharya Charka* attributes *Nidra* as *Adharniya Vega* deprivation of sleep(suppression of natural urge of sleep produces ill effect on health[3]. This might be related to the lifestyle, environmental influence , mental tension, changed food habits and day to day stress which ultimately disturb the psycho neurobiological rhythm of sleep which intern effects performance of cognitive skills, for example memory, learning, logical reasoning ,mathematical calculations and decision making.[4]

Night shift work has lead to dramatically increased overall productivity with in industrialized society there is a growing acknowledgement that, this benefit has not come without a cost to the worker due to it's effect on circadian rhythm which is natural in human race as said *Aacharya Vagbhata*[5]. Shift work is term that applied to a broad spectrum of non standard work schedules ranging from occasional on call overnight duty, to rotating schedules, to steady permanent night work[6]. The symptoms of insomnia in association with some degree of social, occupational, or other impairment are collectively known as shift work sleep disorder[7]. It is estimated that in the developing industrial countries about 20% of workers work night shift. Out of them 2% to 5% of the population experiences problems associated with lack of sleep due to night time shifts. In present conceptual study here is an attempt to explore concept of *Nidra,* it's *Vega Dharanjanya* symptoms, Circadian Cycle and conceptual study of S.W.S.S.D.

Literature Review

NIRUKTI OF *NIDRA:*

The word *Nidra* is a feminine gender derived from the Ni' Prefix is added to Dra dhatu and the word *Nidra* is obtained. 'Ni' prefix is used for meaning down, within, into or backing. 'Dra' dhatu means 'to sleep'. Thus meaning of the *Nidra* is back to sleep, into sleep, down to sleep[8].

DEFINITION OF *NIDRA:*

- When the *manas* (mind) gets exhausted or inactive and sensory and motor organs become inactive then they dissociate themselves from their objects then the individual gets sleep[9].
- *Nidra* can be defined as *"Tamakaphabhyam Nidra"*, it is the state where predominance of *Kapha* and *Tamas* is seen. Adhamalla defines *Nidra* as *"Nidra Swapnechcha Sa Tamakaphabhyam syat Tamoguna kaphasamsargena Bhavati Ityarthaha"* - *Nidra* is the stage in which the *Tamoguna* combines with *Kaphadosha*. Adhamalla further says *"Nidra Indriyamanomohaha"* which means the *Mohavastha* of *Indriya* and *Manas* is called as Nidra[10].

IMPORTANCE OF *NIDRA*

- The person having *Samyak Nidra* (proper sleep) will have

Sukha (happiness), *pushti* (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* (emcitation), *abala* (weakness), *klibata* (impotence), and *agyan* (illiteracy), *ajivita* (death). In this quote of *Acharya Charaka and Acharya Vagbhata* mentioned merits and demerits of sleep[11,12].

NIDRA AS *ADHARANIYA VEGA*:

Charakacharya stated 13 natural urges, which should never be suppressed. '*Nidra*' is also one of them. Hence, sleep should never be suppressed[13].

Our *Aacharya* mentioned that, suppression of natural urges lead to many diseases. Sleep suppression leads to excess yawning (*jrumbha*), Bodyache (*Angamarda*), drowsiness (*tandra*), diseases of head & eyes (*shiro-akshi roga*), etc. *Aacharya Sushruta* & *Vagbhata* also accepted this. Getting to sleep is the only treatment for symptoms raised due to *Nidravega dharana*. In *Yogaratnakar*, indigestion is also included to the above list of complications[14].

According to *Laghu Vagbhatacharya nidravegadharanjanya lakshanas* are *moha, murdha, akshigaurav, alasya, jrumbha* and *angamarda*. These symptoms may disappear by taking proper *Nidra* (good sleep) and doing *sanvahanam* (massage)[15].

As per *Acharya Bhavprakash nidravegvidharan* causes *jrumbha, shirolochangaurav* (heaviness in eyes and head), *angamarda, tandra and annapak* (improper digestion of food)[16].

Acharya Sushruta mentioned that the *nidravagadhar anajanya lakshna* resembles to that of the diseases of *vata* and *pitta*. They mentioned the list of the symptoms as *kasa, swasa, pratisyaya, shirogaurava, angamarda, arodhaka, jwara, agnidaurbalya*[17].

CIRCADIAN RHYTHM[18]

Circadian rhythms refer to the cyclical changes —like fluctuations in body temperature or hormone levels, sleep , wakefulness—that occur over a 24-hour period, driven by the brain's biological clock. Humans sleep and awake at a fairly constant 24 hour rhythm called circadian rhythm.

The biological clock consists of a group of neurons in the hypothalamus called supra chiasmatic nucleus (SCN). An intrinsic body clock residing in the supra chiasmatic nucleus (SCN) within the brain regulates a complex series of rhythms in humans, including sleep/wakefulness. The human being period of the endogenous clock is usually 24 hours and is usually entrained to equivalent the environmental rhythm. These internal 24 hour rhythms 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 —set the biological clock and help to determine when we need to wake up or go to sleep.

DISRUPTIONS OF CIRCADIAN RHYTHM[19]:

When we attempt to stay awake against the schedule dictated by our circadian clock, our mental and physical performance is greatly diminished. Conditions associated with a disruption of circadian rhythms include shift work, jet lag and other circadian sleep disorders. Those who perform shift work, particularly on night shifts, may experience the effects of a disrupted circadian sleep-wake cycle such as excessive sleepiness, poor sleep, loss of concentration, poor motor control, slowed reflexes, nausea, irritability

SLEEP DEPRIVATION[20]:

Sleep disorders are one of the most common complaints encountered in medicine and psychiatry because of their negative effects on quality of life. Sleep deprivation first and foremost affects cognitive functions: memory, attention, executive function, mood, and response time which can lead to hazardous situations.1-3 Even two nights of recovery sleep does little to counteract the effects of sleep deprivation. Psychiatric disorders, affective disorders, addiction, and dementia are associated with sleep disturbances. It is associated with a higher incidence of car accidents, comparable to driving under the influence of alcohol.

OVERVIEW OF CIRCADIAN RHYTHM SLEEP DISORDERS:

There are six distinct CRSDs currently recognized in the International Classification of Sleep Disorders (ICSD-2)[21]

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.

According to the ICSD-2, "The essential feature of CRSDs is a persistent or recurrent pattern of sleep disturbance due primarily to alterations in the circadian time keeping system 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[22].

SHIFT WORK SLEEP DISORDER:

Although the term "shift work" lacks a consistent 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[23,24] 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[25,26,27]:

From a physiologic perspective, shift work requires a sleep-wake schedule that regularly conflicts with the natural, endogenous rhythm of sleep and wakefulness. As a result, a subset of shift workers experience impairments in both sleep and wakefulness that stem from the desynchronization of the two processes that regulate these physiologic functions. The sleep is regulated by the interaction between a "homeostatic pressure" to sleep and a "circadian alerting signal" that encourages wakefulness. The homeostatic pressure increases with each hour of wakefulness and dissipates with sleep. Suprachiasmatic nucleus of the anterior hypothalamus regulates circadian alerting signal. This intrinsic pacemaker confers circadian rhythmicity of approximately 24.2 h not only to sleep and wakefulness but also to 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 largely maintained by external and environmental cues. The natural light/dark cycle is the strongest of these circadian regulators.

In turn, central and peripheral melatonin receptors regulate the aforementioned physiologic functions.

Melatonin levels are low during the day, and then it rises in evening to suppress CNS arousal and set the stage for sleep onset. The onset of melatonin secretion under conditions of

low light (i.e., dim-light melatonin onset) is the single most accurate marker for assessing circadian phase.

Misalignment between the endogenous circadian rhythm and the external 24-hour environment forms the basis for SWSD. The circadian rhythm functions to promote wakefulness during the day and the consolidation of sleep during the night. In shift workers, the main sleep period occurs during the day. So when his or her circadian rhythm is promoting sleep when the circadian rhythm is promoting wakefulness.

In shift workers, these two opponent (homeostatic pressure and circadian alerting signal) processes become uncoupled, negatively affect on both sleep and wakefulness; that is, external "day" is no longer synchronized with high alerting and low melatonin secretion.

So shift workers experience the consequences of excessive sleepiness at work, when wakefulness is required. Lower stimulation (eg, dimmer light, quieter, less bustle) frequently present at night further unmasks a high propensity for sleep. Indeed, unintended sleep does occur during night shift.

DISCUSSION

The salient observation made during the study entitled –conceptual study of *Nidra as Adharniya Vega with* special reference to Shift Work Sleep Disorder are critically analyzed and discussed here.Sleep is a crucial behavior characterized by minimum movement, reduced response tos timuli and species-specific timings[28]. The circadian process establishes the sleep phases with the light and dark cycles that cause sleepiness at night and wake by daytime. The whole day is divided into two parts; night is reserved for *Nidra* and day is for *karma* i.e. to work[29]. Shift work sleep disorder is actually a circadian rhythm disorder, the most common trouble faced by many individuals working in night shifts or rotational shifts. Activities that disrupt these biological processes, such as shift work or disturbance in regular sleep timings influence the progression of sleep disorders.

Sleep disturbances may leads to poor sleep hygiene, medical conditions, and circadian rhythm disorders which are most common symptoms for scheduled sleep-wake periods and shift work sleep disorder. Sleepiness in the work station may leads to poor concentration on work, accidents and injuries. Persons undergoing shift works for more years are close to risk for a variety of chronic illnesses such as cardiovascular and gastrointestinal diseases and on the other end it shows negative results in performance of work in terms of increase in work related errors and accidents.

Discussion on Disease Review:

Sleep is considered as *Bhuta dhatri* which means which provides nourishment and rejuvenation to all creatures in earth. *Ayurveda* says in *Rartricharya* that for good quality of sleep one should eat light food which is easily digestable followed by short walk in moonlight and prayer before going to sleep[30]

As already seen in conceptual part, Circadian rhythm is the one which controls normal night sleep and daytime wakefulness. Light and dark environment can act as external stimulus for the circadian rhythm. Melatonin which is secreted by the Pineal gland induces sleep. Darkness can stimulate the secretion of melatonin.

The well-lighted atmosphere in the shift work area can act as a stimulus for the inhibition of melatonin secretion. Light stimulus which enters the retina send impulses to hypothalamus, from there sympathetic nerve cell bodies send impulses to pineal gland. This may lead to the inhibition of melatonin secretion. Hence causes disruption in normal circadian rhythm which in turn leads to Shift Work Sleep Disorder (SWSD). And resulted in short term and long term effects. SWSD resulted in short term effects like impaired work performance, learning etc. Thus one's ability to initiate any work is hampered.

DISCUSSION ON *SAMPRAPTI*:

SWSD; even though not mentioned directly in the literatures of *Ayurveda*, classics vividly explain the signs and symptoms of *Nidra vega dharana* and its consequences on health.

The diagnostic features of SWSD exactly matches with the clinical picture of people who withheld the urge of sleep. Hence this work correlates SWSD and its understanding in *Ayurveda* under the umbrella of *Nidra vega dharana*. The treatments[31,32] for *Nidra vega dharana* may be effective in combating these spectra of disorders, among which sleep wake scheduling is clinically tested here.

POSSIBLE *SAMPRAPTI GHATAKA*:

Dosha: Vata and Kapha pradhana Tridosha
Dushya: Rasadi dhatu
Agni: Vishamagni, Mandagni
Ama: Rasadhatugata ajirnavat
Srotas&SrotodushtiPrakara: Manovaha srotas
Adhishthana: Shareera and manas
Vyaktasthana: Shareera and manas
Rogamarga: Madhyama

CONCLUSION

Conceptual study of *Nidra* as *Adharniya Vega* with special reference to Shift Work Sleep Disorder is an effort to correlate shift work sleep disorder with *Nidra Vega Vidharan*.So this study further helps in treatment aspect by advising proper scheduling of work, and maintaining proper life style.

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