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NIDRAVIPARYAYA AND SOCIAL JET LAG: WHAT AYURVEDA HAS TO SAY

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ABSTRACT

Nidraviparyaya (deviated sleep pattern) is the term used in Ayurveda for deviated sleep due to avoidance of the doctrine of natural sleep habits. Similarly Social Jet Lag is a sleeping-related condition that forms the foundation of other lifestyle disorders. Mostly has an impact on shift workers' health hence also termed Shift work Disorders. The present review has focused on *nidraviparyaya* and its harmful effects which simulate social jet lag. The methodology has been used to hold up the study by digging out the concept of *nidraviparyaya* from various ancient texts along with research published about social jet lag and sleep disturbances on different search engines like Pubmed, NIH, Google Scholar etc. In conclusion, Ayurveda emphasizes the balance of the three *doshas* (*Vata*, *Pitta*, and *Kapha*) and believes that an imbalance in these *doshas* can lead to various health issues, including sleep disturbances. Integrating Ayurvedic principles alongside conventional medical care, under the guidance of qualified practitioners, can be a holistic approach to addressing sleep issues. In this paper an effort has been made to bring out the facts about social jet lag which may be generated by *nidraviparayay* and different paradigms of Ayurveda have been used to address these issues.

Key words: Social Jet Lag, Insomnia, Ayurveda, *Nidraviparyaya*.

INTRODUCTION: Over the past 200 years, human lifestyles have dramatically transformed due to numerous advancements. In the current industrial era, modern techniques are utilized for improved economic benefits, yet there is less focus on health maintenance. Everyone is striving and competing to keep up. ^[1]

For a better lifestyle and status, everybody is neglecting his body's needs or the tripods i.e. balanced diet and sleep in proper quality and quantity. When we look back to Worldwide catastrophic events in recent history mostly occurred due to sleep deprivation such as the Challenger explosion in the Metro North train crash in 2013, the Hoboken Train crash in 2016,

and also many road accidents ^[2,3]. The essential habit is missed from the list because many people take sleep for granted. Modern Science believes that Sleep wake cycle has various physiological impacts on health status ^[3]. A study had found that linkage of adverse health misalignment [Circadian Rhythm sleep wake misalignment ^[4]. Several million people worldwide do their jobs in shifts rather than regular day shifts. They have to face the problem regarding sleep and alertness in their jobs on the night shift ^[4]. In the era of industrialization and excess development, so many new techniques certainly eased our lives, but it also introduced a new phenomenon in the population which is known as Circadian

Misalignment^[1]. The mismatch between the body's internal time and environmental time (due to job profile) is termed Circadian misalignment also termed as Social Jet lag^[1,2,3,4]. Circadian misalignment is mostly observed in shift workers like hospital staff, industry workers, and transport department and the people mostly travel from one time zone to another time zone^[3]. The shift working persons do not follow the sleep doctrine and also either neglect the natural urges like appetite, thirst, sleep, flatus, and urine or generating these urges voluntarily at their convenience. It is *Vegadharan* in term of Ayurveda which leads to *vata dosha* vitiation and precipitate sleep related disorders^[11]. Ayurveda is the ancient science of life describes *Sevitkala nidra*^[6] and *ratricharya*, The natural sleep time (*ratriswabhavprabhava*) is the primer to promote wear and tear mechanism of body and maintain health^[11,12,13]. *Nidraviparyay* is contrary to the above said situation also termed as *nidravatyakrama*^[13,14]. Ayurveda offers holistic approaches to health and wellness, including the management of sleep disorders as Social Jet Lag.

AIM AND OBJECTIVE: The study aims to explore the effect of Social jet lag generated through *Nidraviparyaya* and correlate different paradigms of Ayurveda to address the conditions of Social Jet Lag.

MATERIAL AND METHOD: Literature review of various Ayurvedic texts of *Brihuttrai* and *Laghutrayi*, online database, modern medicine textbooks, and journals.

Social Jet Lag and its effects on health: Social Jet Lag (S JL) is when your preferred sleep schedule doesn't match up with the sleep schedule required by your work.^[1,2] Shift work sleep disorder in

terms of social jet lag (S JL) is a newly observed health problem. Social jet lag has been observed to negatively affect human health in the short term or long term^[1,2].

Short-term effects of Social Jet Lag (S JL) include poor and reduced sleep, decreased alertness, poor work performance, and abnormal inflammation and immune response. Long-term S JL-associated effects are a higher risk of the development of cardiovascular disease, diabetic mellitus, metabolic syndrome, irritable bowel syndrome, peptic ulcer, psychosomatic disorders, cognitive impairment, etc^[1,2,3]. Because of many sleepless nights sleep debt increases and people suffer from behavior and psychiatric disorders, even many road accidents could occur due to sleep disturbance^[5,6,7]. Sleep involves significant psychological changes, marked by shifts in brain activity and a slowing of basic bodily functions, accompanied by notable alterations in consciousness (Lim et al., "Association Between Night-shift Work, Sleep Quality and Metabolic Syndrome").

Adverse Effect of Social Jet Lag:

Many research papers and reviews have reported the negative impact of S JL in various physiological processes i.e. Glucose Metabolism, Core Body Temperature, Blood Pressure, Metabolic Syndrome etc^[7,8,9] These are the following ways where S JL impact has been observed highly -

Cognitive Performance: Poor sleep quality has also been studied in shift workers because of their work schedules. Shift workers must frequently adjust their wake-up and bedtimes to accommodate different shifts. Shift assignments typically don't consider an individual's chronotype, causing Social Jet Lag (S JL) in shift

workers. This results in decreased alertness, increased fatigue, difficulty waking up in the morning, and lower performance compared to those unaffected by SJL.

Metabolic Shifts: Individuals suffering from SJL tend to eat more high-calorie and high-sugar foods, leading to metabolic changes.

Diabetes: SJL is linked to abnormal carbohydrate regulation, elevated fasting insulin levels, and increased insulin resistance.

Non-Communicable Chronic Diseases (NCCD): Conditions such as diabetes, high blood pressure, obesity, and dyslipidemia are positively associated with SJL. Epidemiological studies on shift workers have also found a connection between SJL and altered heart rates.

Psychiatric Disorders: SJL has a positive association between depression, emotional behavior problems, mood alteration and bipolar disorder^[10,11].

Various other studies have been done focusing on the negative health effect of Social Jet Lag. A study done by Roacco et al. showing Social Jet lag and Related risk for human health. Mata M.C. et al found Social Jet Lag association with impaired metabolic control during one year of follow up. Daria et al. has also supported the same finding with their work on Persistence of Social Jet Lag and Sleep Disruption in Healthy Young Adults.

Assessment of Social Jet Lag (SJL): Measuring Social Jet Lag (SJL): Social Jet Lag (SJL) is calculated as the difference between the mid-sleep point on free days (MSF) and workdays (MSW), as defined by Wittmann et al. in 2006. Mathematically, SJL is the absolute difference between MSF and MSW^{[1][2][3]}.

SJL=MSF-MSW

While there isn't a clinically established cutoff for SJL, individuals with SJL greater than or equal to 2 hours are considered to experience Social Jet Lag. It is also said that SJL is associated with evening Ness or owl type chronotype has poor academic performance and behavior problem^[8,9,10].

Ayurveda view of Sleep: Ayurveda recognizes sleep as one of the fundamental sub pillars, known as *Trayopastambhas*, essential for maintaining and sustaining an individual's overall health. Ayurveda has also described the importance of *nidra* and its impact on our physiological and psychological well-being. A balanced sleep has a positive impact on our sensory organs, memory, immunity as well as many organ systems. If sleep is taken at its optimum quality and quantity is said the *samyaka nidra*^[11,12]. It provides *sukha* (happiness), *pushti* (good physique), *bala* (immunity), *vrishta* (sexual power) and *gyan* (wisdom)^[5,6]. The all attributes of *Nidra like* happiness, Immunity, sexual satisfaction, wisdom could be achieved only when the timing of sleep and quality of sleep are optimum. On the other hand, if sleep administration is not in proper quality and quantity person suffers from sadness, emaciations, impotence, and disease state. Acharya Charka also mentioned that optimum time of sleep (*sevit kala nidra*) is the only way to achieve longevity^[12,13]. Acharya Sushrut has given a wide description in Su S. 24/88 of *sevitkala nidra* or a specific time for sleep, the ultimate way to achieve *Dhatusamyā* (state of wellbeing) along with *Pushti, varna, bala* etc.^[13,14,15].

Types of Nidra or sleep as per Acharya Charak (Ch. Su21/58-59): It has been classified into the following categories^[15].

Tamobhava Nidra: When *tamo guna* of *mansika bhava* increases then person feels sleepy.

Shleshma samudbhava: *Nidra*, which is due to accumulation *kapha dosha*, it is known as *shleshma samudbhava*. This type of *nidra* occurs in daytime or *kapha kala*.

Manasharira shrambhava: When *mana* and *sharir* got tired due to heavy physical or mental work and it would be the initiation factor for sleep physiology is known as *manasharis sambhava nidra*. Another concept of Ayurveda is that excessive excretion is the prime factor for *vata prakopa* and *vata* is also responsible for *nidra*.

Agantuki nidra: *Agantuki* type of *nidra* is due to any disease. According to Acharya Chakrapani this type of *nidra* is also known as *arishtasambhoota nidra* means the sleep leads to death. *Agantuki* and *Tamobhava* both types of *nidra* indicate symptoms of death. The difference between the two is that in *Tamobhava nidra* exclusively *tamo guna* increased and the cause of *Agantuki nidra* has no specific known factor^[16,17].

Vyadhyanuvartini nidra: The type of sleep which comes after as the complication of disease is termed as *vyadhyanuvartini nidra*.

Ratri svabhava prabhava: *Nidra* which has occurred specifically at night is known as *ratri svabhava prabhava*. It is physiological type of sleep which has been explained as tripod of life. Acharya Charaka also termed it *Bhootdhatri nidra*. According to Acharya Chakrapani *Bhootdhatri nidra* helps to nourish the body and maintain health like mother or *Dhatri*^[18,19,20]. Acharya also explained here that *tamobhava nidra* is not good for health as it increases *tamo guna*, so it should be avoided.

Types of Nidra or sleep as per Acharya Sushruta (Su.Sa.4/32): It has been classified into the following categories^[16]:

Vaishnavi Nidra: *Vaishnavi Nidra* is the physiological type of sleep it may compared to *ratri swabhavaprabha Nidra* as described by Acharya Charaka.

Vaikaraki Nidra: If a person doing excessive physical or mental work along with starvation (*langhana*) his *vata* gets vitiated and *kapha dosha* decreases this is *vaikariki Nidra*. It may compared as 4 types of *nidra* described by Acharya Charaka (*Shleshmasamudbhava, Manasharirshramsambhava, Agantuki, Vyadhyanuvartini*)

Tamasi Nidra: The type of sleep that occurs more than *tamo guna* is termed as *tamasi nidra*. It occurs at the time of unconsciousness or death.

Types of Nidra or sleep as per Acharya Vagbhata (As.Su.9/48): It has been classified into the following categories^[20]

Kalavabhava: The occurrence of sleep at its optimum time is as *kalavabhava nidra*. It is the same as *Vaishnavi nidra* as described by Acharya Charaka.

Amaya prabhava nidra: The type of sleep which occurs due to any present disease is termed *Amayaprabhava*. It is as same as *Vyadhyanuvartini* and *Vaikariki nidra* described by Acharya Charaka and Acharya Sushrut.

Chittakleda prabhava nidra: If is due to any *mansika vikar nidra* occur is termed as *Chittakledaprabhava*. It is as same as *Manasharirshramsambhava nidra* described by Acharya Charak and Acharya Sushrut.

Dehakledaprabhava: *Nidra* due to excessive tiredness of body termed as *Dehakledaprabhava*.

Kaphaprabhava Nidra: Nidra occurs due to excessive *kapha dosha*. In this type of *nidra* person during day and night which is more than optimum quantity.

Aagantuki Nidra: This type of *nidra* occurs due to any external factors like accidents or diseases. It is the same as *Agantuki nidra* described by Acharya Charaka.

Tamobhava nidra: This type of *nidra* occurs due to disbalance of *mansika dosha* in which *tamo guna* excessively increased. It is a very dangerous type of sleep.

When we collectively analyzed all the Ayurveda text regarding types of *nidra* found *Ratriswabhavprabha* (sleep occur during night) is only physiological sleep, it has the potential to nurshised and repair of body organelles and sensory systems hence also termed as *Bhootdhatrinidra* [20,21]. According to *Vagbhataacharya* it refers as *Kalaswabhavaja* (*nidra* at time) and in *Sushrut Samhita* it called as *Vaishnavi Nidra*.

Concept of Nidraviparyaya and its negative effect of health:

Nidra is an essential factor for *Dhatu-samyak*, to achieve *Dhatu-samyak* entire guidelines has been described in our ancient text. The regular and disciplined way of following *nidra* etiquette helps to achieve a healthy status [11]. There are two types of irregularities of sleep described, one is *Diwaswapna* and another is *Ratijagran* both of them combined termed as *Nidraviparyaya* [12,13]. The meaning of *viparyaya* is opposite or against. *Ratijagran* can be explained as not to indulge in sleep-in nighttime or delay *nidra* at night (late night sleep) or waking up too early in the morning (as the need for a shift job) which increases *vata dosha* and *ruksha guna*. *Diwaswapna* is the indulgence of sleep-in daytime

(*Diwaswapna*), especially after taking a meal. *Nidraviparyaya* as *diwaswapna* provoked *kapha dosha* by increasing *snigdha – abhishyandi guna* leads to heaviness, laziness, lethargic, and sluggishness to all physical as well as mental activities. *Diwaswapna* and *Ratijagran* both contrast in character but have the same type of effect on *Agni* [14,15]. *Agni* gets vitiated and will be the root cause of all diseases, reducing *Bala* hence *nidraviparyaya* is said to be the major cause of *Balakshaya* (low immunity) [20,21]. In our ancient text *nidra viparyaya* mentioned as etiological factors for various diseases like *Agnimadhya*, *Medoroga*, *Sthaulya*, *Kushtha*, *Pidika*, *Granthi*, *Vatarakta*, *Vatavyadhi*, *Ardhambhedak*, *Jwara*, *Avashada* ect. *Nidra viparyaya* (*Ratijagran* and *Diwaswapna*) make foundation for diseases state of mind as well as body [12,13,14,15]. Acharya *Sushrut* said that the wise person always follows *Nidra* doctrine and does not prefer to sleep in daytime and awake in night hours as it is most important factor for *doshik imbalance* [15]. Acharya *Charak*, Acharya *Vagbhata* said that *Akal nidra* (sleep at the improper time), *Atiprasanga nidra* (excessive sleep), *A-Shevit nidra* (no sleep) are like *kala ratri* which can destroy *Arogya* and *Ayu*. The physiological sleep (*kalanidra*) is the best which provide *Sukhayu* [14,15].

DISCUSSION: Wittmann et al. (2006) termed the misalignment between one's preferred sleep/wake schedule and social demands as Social Jet Lag (S JL). As with changing lifestyle, sleep pattern is also affected, so various sleep-related disorders have emerged in the form of Sleep Jet lag [9, 10]. In other words, the term Social Jet lag is used to show the misalignment between biological time determined by our

internal body clock and social time dictated by social obligations like shift job duties^[10]. Ayurveda has the principle of *Nidra* and its *deviation* in terms of *Nidraviparyay*, observing it as etiological factor for generation of diseases. *Nidraviparyaya* in terms of *Diwaswapna* or *ratrijagran* leads to imbalance of *dosha* with increased^[15,16,17] *ruksha*, *snidghya guna* then depression, anxiety, high blood pressure, heart attack, stroke, obstructive sleep apnea, type 2 diabetes, obesity and many types of mental disorders can arise^[1, 2, 3, 4, 5].

The shift working persons do not follow the sleep doctrine and neglect the natural urges like appetite, thirst, sleep, flatus, and urine or generating these urges voluntarily at their convenience^[17, 18]. It is *vegadharan* in term of Ayurveda which leads to *vata dosha* vitiation and precipitate sleep related disorders^[17, 18, 19, 20, 21].

Hence, Practicing *Nidraviparyay* since long time drag the healthy person in disease state over a period and complement the effects of social jet lag. This tenet of Ayurveda became very significant in the context of Social Jet Lag.

CONCLUSION:

Generally, we think that sleep is a time of rest and recovering from stress of everyday life. New evidence and research about sleep provide evidence that sleep is essential to maintain health, mood, memory and cognitive performance along with physiology of endocrine and immune system. Meta analysis of sleep shows that inadequate quality and quantity of sleep has linkage with diseases like obesity, diabetes, hypertension depression and many more. The shift working persons do not follow the sleep doctrine and neglect the natural urges like appetite, thirst, sleep, flatus, and urine or generate these urges

voluntarily at their convenience. It is *vegadharan* in term of Ayurveda which leads to *vata dosha* vitiation and precipitate sleep related disorders. Ayurveda also describes *Sevitkala nidra* and *ratricharya*, the natural sleep time (*ratri swabhavprabhava*) is the primer to promote wear and tear mechanism of body and maintain health. *Nidraviparyay* is contrary to the above said situation also termed as *nidravatyatikrama*, Hence *Nidraviparyay* effect simulates with Social Jet Lag. This principle of Ayurveda becomes very significant in the context of Social Jet Lag.

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