REVIEW ARTICLE JPAR 2024

Journal of Pharmaceutical Advanced Research

(An International Multidisciplinary Peer Review Open Access monthly Journal)

Available online at: www.jparonline.com

Herbal Remedies for Jet Lag: An Ayurvedic Approach to Rejuvenation

Pratibha Hanspal[1], Prerna Dhiwar[1], Ujjawal jaiswal[2], Suchita Wamankar[2*], Rajesh Kumar Nema[2]

[1]Rungta Institute of Pharmaceutical Sciences and Research, Kokha, Kurud, Bhilai-490024, Chhattisgarh, India.
[2]Rungta Institute of Pharmaceutical Sciences, Kokha, Kurud, Bhilai-490024, Chhattisgarh, India.

Received: 15.10.2024 Revised: 22.10.2024 Accepted: 28.10.2024 Published: 31.10.2024

ABSTRACT:

Jet lag is a pervasive issue experienced by tourists moving across time zones, causing disturbance in circadian rhythm leading to various symptoms such as insomnia, fatigue, digestive issues, irritability, and trouble focusing. So, there is a growing demand for natural remedies for providing relief and promoting lasting recovery. This review explores the potential of this Ayurvedic herb in combating jet lag. Herbs such as Ashwagandha (*Withania somnifera*), Shankhpushpi (*Convolvulus pluricaulis*), Tulsi (*Ocimum sanctum*), Brahmi (*Bacopa monnieri*), and Jatamansi (*Nardostachys jatamansi*) have demonstrated significant effectiveness due to their adaptogenic, stress-relieving, sleep-aiding, cognitive-enhancing, and soothing properties. This article aims to enlighten us about the post-travel recovery strategies using Ayurvedic herbs, including them in our routine travel, strengthening physical resilience, and mental wellness.

Corresponding author:
Ms. Suchita Wamankar
Associate Professor
Rungta Institute of Pharmaceutical Sciences,
Kohka, Bhilai, Chhattisgarh, India
Tel: +91-9893477847
E. Mail ID: suchitawamankar@gmail.com

Keywords: Jet lag, Pervasive Issue, Circadian Rhythm, Natural Remedies, Cognitive Enhancement, Sleep Aid.

INTRODUCTION:

Jet lag, clinically referred to as chronobiological disruption, is a pervasive issue impacting travelers each year as they cross time zones. It disturbs the body's biological cycle that regulates several biological processes in the body. This results in various symptoms, including fatigue, insomnia, poor concentration, irritability, and even digestive discomfort. While current remedies, such as melatonin supplements and therapies such as light therapy, can provide short-term relief, a wide range of people are seeking natural, unified remedies that aid the body's intrinsic capability to adjust and regain balance.

Over 5000 years ago, Ayurveda, a traditional system that helps in the natural healing of the body, came to

India. It provides beneficial remedies through its vast knowledge of vitalizing and restoring medicinal herbs. The ayurveda prevents unwanted suffering and provide a balanced and fulfilling lifespan [1]. It stabilizes mind and body, and it uses natural remedies to promote the body's capability against various sources of stress. Certain ayurvedic herbs, such as Ashwagandha (*Withania somnifera*), Brahmi (*Bacopa monnieri*), and Shankhpushpi (*Convolvulus pluricaulis*), have been used for their adaptogenic, calming, and relaxing properties [2]. These herbs have the ability to decrease jet lag symptoms by increasing relaxation, reducing fatigue, and helping to restore the circadian cycle.

By incorporating these herbs into the travel routines of travelers, it may be possible to manage the physiological and cognitive difficulties caused by changes in time zone more naturally and sustainably. Their distinct properties help in decreasing the symptoms caused by disruption of the circadian cycle. Growing interest in this integrative approach has led to enhanced focus on the potential of these herbal remedies. By emphasizing the extensive uses and increased benefits of these herbal remedies, we hope to incorporate these Ayurvedic practices into the routine life of travelers to enhance their travel experience and overall holistic health [2].

Description of Jet lag:

A common ailment that affects visitors who cross many time zones is jet lag, also known as circadian disruption sleep disorder. It happens when the circadian cycle, the body's rhythm, is not in sync with new time zone. Sleep patterns, endocrine function, digestive secretion, and thermoregulation are just a few of the essential body processes that are regulated by this internal clock.

Unexpected time zone changes lead the body to struggle with adjusting, which frequently results in a number of undesirable symptoms. Jet lag is commonly characterized by sleep difficulties, irritability, exhaustion, gastrointestinal distress, and cognitive impairment, including memory issues and difficulty concentrating. Factors such as the number of time zones travelled and the direction of travel (eastward travel frequently results in more severe symptoms). Eastward travel causes little sleep, lengthy Rest delay is prevalent moving further west. Brief rest with a quick awakening is noticeable [3].

With a large number of competitors going across much time difference, the discussion for sports performance is receiving a bit of focus. In a prior study on the consequences of exhaustion affecting athletic performance, sport participants fared much worse after competing overseas after prolonged heading east time region transfer [3].

To help the body adjust, many treatments are used, including light exposure therapy, sleep schedule regulation prior to travel, and the use of melatonin supplements. However, many passengers are becoming increasingly interested in herbal therapies, such as Ayurvedic herbs, to aid in a more controlled and viable recovery from jet lag.

Mechanism of jet lag:

Whenever the body's circadian rhythm fails to remain in synchronization with the time zone in a new location, jet lag occurs. SCN regulates circadian rhythm; it responds to light and dark impulses in the environment to help coordinate the body's bodily functions together with a 24-hour cycle.

Travelling in multiple time zones, especially long distances, disturbs this coordination because it takes a while for the chronobiological rhythm to adapt to the new time region. Jet lag symptoms are caused because the body cannot instantly adjust to light exposure at distinct times of the day, particularly in the morning and evening.

The direction of travel, travel tiredness, and a shortage of restful sleep from prolonged sitting, usually in a small airline seat, drinking excessive beverages or caffeine can make the symptoms severe [4].

Effects of jet lag:

- Disturbance in sleep-awake cycle: Can cause difficulty sleeping during the night, also known as insomnia, and make a person feel tired in the daytime.
- Impairment of cognitive function: It can lead to difficulty concentrating and decreased focus and cause memory issues in a person.
- Imbalance in hormones: Jet lag often leads to a decrease in the secretion of melatonin that controls the sleep cycle: It also leads to fluctuations in cortisol levels, also known as stress hormones that can cause fatigue and stress.
- Digestive issues: It often leads to constipation, bloating, loss of appetite, and other discomforts in the digestive tract during a journey.
- Weaken immunity: Disruption in the circadian cycle can cause suppression of immunity that makes the travelers more prone to illness and allergy.

- Regulation in body temperature: Jet lag disrupts an ability of traveler to regulate temperature or thermoregulation, which can cause a person to feel excessively cold or hot during times.

Herbs and their role in the treatment of jet lag symptoms:

By assisting the body in adjusting to time zone shifts, promoting relaxation, and regaining equilibrium in altered biological cycles, Ayurvedic remedies give a natural method to manage jet lag. The ancient Indian health care system referred to as "Ayurveda" focuses an immense value on re-establishing equilibrium inside the body, which makes it an excellent choice for treating jetlag-related disturbances. Ayurveda states that medications like Sarpgandha, Vacha, Ashwagandha, and Brahmi provide a calming and relaxing effect that encourages restful sleep [5,6].

Some herbs are listed below.

***Ashwagandha*:**

It is useful due to its adaptogenic property it manages and adapt to new time zone. It can also maintain cortisol level in our body that reduces stress fatigue and improve cognitive performance [6]. Ashwagandha root extract has anti-stress, antioxidant, adaptogenic, and immunostimulant properties it can also be used in improving or maintaining the physical and mental health [7].

Fig 1. Ashwagandha (*Withania Somnifera*).

***Tulsi*:**

Also known as, sacred basil have adaptogenic, immunomodulatory, anti-fatigue and calming properties that helps to reduce symptoms of jet lag [8]. It also has an ability for lowering cortisol level. Healthy energy levels are linked to balanced cortisol levels, which also support the body in maintaining normal sleep schedules and offering the right hormonal support during the day.

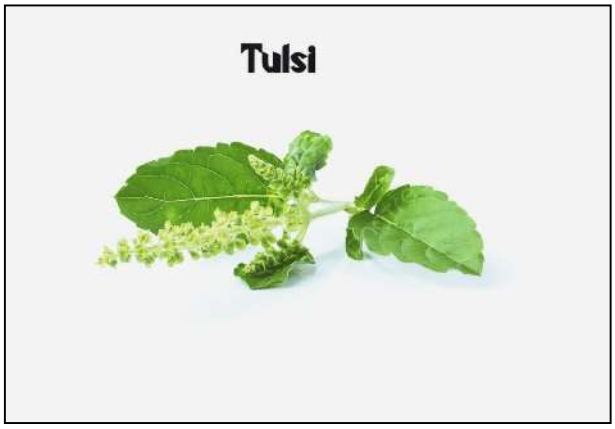

Fig 2. Tulsi (*Ocimum tenuifloram*).

***Shankhpushpi*:**

It generally has nootropic or memory enhancing, anxiolytic, antidepressant, anti-inflammatory and sedative properties that deal with jet lag symptoms [9,10]. It calms the nerves by regulating the body's production of the stress hormones [11].

Fig 3. Shankhpushpi (*Convolvulus pluricaulis*).

***Brahmi*:**

It has a potential property of improving memory, related disorders, and enhance efficiency of transmission of nerve impulse there by strengthening memory and cognition; it also has Anxiolytic effect, Gastroprotective activity, anti-inflammatory action and antidepressive effect that are essential for treating the symptoms of jet lag [12].

Jatamansi:

It has stress relieving property that helps to reduce stress and antioxidant property also act as a good mental stimulant, and antidepressant activity, tranquillizing activity, and used in various digestive issues [13].

Fig 4. Brahmi (*Bacopa monnieri*).

Fig 5. Jatamansi (*Nardostachys jatamansi*).

The mechanisms by which certain herbal remedies can be beneficial for treating jet lag include:

- Adaptogenic properties: when the body is stressed because of jet lag, adaptogens help to regulate the neuroendocrine system axis and keep cortisol levels stable. It reduces tension and restores the body's homeostasis. These substances are medicinal plants that improve coping mechanisms and aid the body's adaptation by normalizing physiological systems during times of high stress, an adaptogen must prevent stress-related damage, be safe, have stimulating benefits, be benign, not disrupt any biological functions, and be free of any negative consequences such as withdrawal symptoms [14]. Example: Ashwagandha with Tulsi.
- Inducing sleep-Sleeping is a state of temporary drowsiness during which the brain responds less to external stimuli and healthy sleep is critical for cerebral growth, memory, learning, cardiovascular and metabolic control, Sufficient sleep is required to recuperate from previous waking activities and promote good performance during subsequent awake [15]. Example: Ashwagandha and Tulsi.
- Supporting the Circadian Cycle: Some herbs have a soothing effect by producing hormones such as serotonin and Gaba neurotransmitters, which relax the body and mind and encourage deep sleep. Repetitive disturbances of the circadian clock, such as chronic jet lag a scenario similar to shift work can result in quasi-periodic or unpredictable oscillations [16]. Example: Shankhpushpi and Brahmi.
- Balancing hormone: To treat jet lag, it is vital to control the production of certain hormones, which are especially a stress hormone (cortisol) for managing stress and sleep hormone (melatonin) for sleep schedule regulation. Circadian neuroendocrine system changes that deviate from natural day/night cycles are assumed to be a major cause of common jet lag symptoms which involves melatonin, hormone cortisol and thyroid-stimulating hormone [17]. Example: Ashwagandha and Tulsi assist regulate cortisol levels, whereas Brahmi regulates melatonin levels.
- Cognitive function: Concentration, retention of information, language processing speed, orientation, judgement, visuospatial, and executive functions are all part of neurocognition [18]. Some herbs can improve cognitive alertness and focus in the brain through enhancement of neurotransmitter function and circulation. Example: Shankhpushpi and Brahmi.
- Improving Resistance to infection: Inherentdefense mechanisms are one's primary phase of safeguarding towards microorganisms, pattern recognition receptors allow circulation and tissues-specific innate immune cells to recognize infections or cell damage [19]. Frequent travel can weaken immunity, making a person more susceptible to allergies and infections. A few plants are used to improve immune function by boosting immune stress and assisting the body in combating oxidative stress. Example: Ashwagandha and Tulsi.
- Antioxidant properties: Oxidative stress may contribute to the severity, in addition, impaired skeletal muscle function and exercise performance are also mediated by elevated oxidative stress and

Table 1. Comparison between Ayurvedic remedies and conventional treatment.

Feature	Ayurvedic Remedies	Conventional treatment
Strategy	It balances the overall natural circadian rhythm of the body and enhance the adaptability of individual It helps in treatment of specific symptoms such as insomnia or cognitive efficiency	It helps in treatment of specific symptoms such as insomnia or cognitive efficiency
Duration	Long term relief	Short term symptomatic relief
Remedies involved	Use herbs to ease Jet lag symptoms by adapting to circadian rhythm	Melatonin supplements, sleep aid and light therapy are used to treat symptoms of jet lag
Side effects	Very minimal	Cause dependency
Overall Support	Supports broad range of system such as nervous, digestive, endocrine system	Emphasize on sleep and alertness

- inflammation in hypoxia, which could be partly prevented by the administration of antioxidants [20]. Some herbs are abundant in antioxidants, which neutralize free radicals produced by environmental stress. They boost energy and immunity by reducing oxidative damage while keeping healthy cells. Example: Tulsi.
- Anti-inflammatory properties: Immune cells possess a unique biological clock, and the cycle of light and darkness has a direct influence on the inflammatory response [21]. Many factors can contribute to inflammation, including lack of sleep, changes in appetite, and inadequate fluid intake to treat this inflammation various herbs are used. Example: Shankhpushpi and Brahmi.

Incorporating Ayurvedic remedies in travel routine:

While travelling, prepare the Ayurvedic herbs in an easily consumable form, such as powders or tea bags. Consult an Ayurvedic practitioner about the dosage and any contraindications with other drugs or foods. Herbal essential oils can be used as aromatherapy on longer trips. Herbal teas with these herbs to stay hydrated and relieve digestive issues. To alleviate jet lag symptoms, use aromatherapy with these herbs with the daily breathing exercises. This adaptogen can also be taken prior to travel to help reduce jet lag. Sunlight exposure can also help in restoring circadian rhythm.

Management of circadian rhythm along with consuming Ayurvedic herbs:

Along with consuming Ayurvedic herbs for jet lag management of this is also necessary by taking regular sleep and proper diet and following a healthy lifestyle this symptom can be prevented. It can also be managed by following Ayurvedic practices such as dinacharya (daily routine), pranayama (breathing control), sunlight exposure and abhyanga (body massage) [22]. Ayurvedic science emphasizes mental balance with the physical as well as spiritual planes. meal and rest are known to be the supporting pillars of life in Ayurveda, balanced utilization of all three results in an active life with adequate nourishment and vigor [23].

Dinacharya - Those who practice daily routine can remain healthy and this is an idea in Ayurveda explained by several Acharyas. It contributes to health through regulating the body's circadian cycle, which is regulated by the hypothalamus, as well as controlling biological rhythms [24]. Following daily routine according to schedule and setting time for completing every task in the routine will help a lot in managing the circadian rhythm.

Pranayama - It helps the body in maintaining oxygen level in the body and makes the mind calmer that helps in adjusting to new time zone.

Sunlight exposure - Sunlight is also recognized as the most significant "zeitgebers" for human circadian rhythm [25]. Coming in contact with the sunlight awake your body and mind and helps in adjusting the body to new time zone.

Abhyanga -Massage can help in reducing the stress building in the body and make our mind calm and helps in providing sleep at night.

CONCLUSION:

This review looked into the approach of herbal remedies in curing symptoms of jet lag, their benefits, and mechanism. Herbs such as Ashwagandha, Tulsi, and Brahmi assist in minimizing stress, enhance sleep, and boost cognitive performance via adjusting the body to a

circadian rhythm. In addition, with those medicinal plants,

Ayurveda lifestyle habits like creating a consistent daily schedule, doing breathing exercises, and implementing Abhyanga (self-massage) enhance psychological and physical wellness while travelling. This mix of natural therapies and attentive activities enables a complete and for a long-time approach to preventing jet lag and circadian disruptions. Asinterest in integrative and natural medicines rises, greater study into the specific processes as well as benefits of herbal remedies in jet lag management may consolidate their significance.

ACKNOWLEDGEMENT:

The authors thankful to Rungta Institute of Pharmaceutical Sciences and Research, Bhilai, Chhattisgarh and Rungta Institute of Pharmaceutical Science, Bhilai, Chhattisgarh for providing necessary facilities and database

REFERENCES:

1. Parasuraman S, Thing GS, Dhanaraj SA. Polyherbal formulation: Concept of Ayurveda. Phcog Rev, 2014; 8(16): 73-80.

2. Tiwari S, Talreja S. Insomnia: A study on sleeping disorder with the reference of Ayurvedic herbs. J Pharm Sci, 2020; 12(11): 1375-1379.

3. Arendt J. Managing jet lag: Some of the problems and possible new solutions. Sleep Med Rev, 2009; 13(4): 249-256.

4. Sack RL. The pathophysiology of jet lag. Trav Med Infect Dis, 2009; 7(2): 102-110.

5. Ohayon MM. Prevalence of DSM-IV diagnostic criteria of insomnia: distinguishing insomnia related to mental disorders from sleep disorders. J Psychiat Res, 1997; 31(3): 333-346.

6. Priyanka G, Anil Kumar B, Lakshman M, ManvithaV, Kala Kumar B. Adaptogenic and immunomodulatory activity of Ashwagandha root extract: An experimental study in an equine model. J Psychiatr Res, 2020; 7: 541112.

7. Majeed M, Nagabhushanam K, MundkurL. A standardized Ashwagandha root extract alleviates stress, anxiety, and improves quality of life in healthy adults by modulating stress hormones: Results from a randomized, double-blind, placebo-controlled study. J Med, 2023; 102(41): e35521.

8. Singh N, Gilca M. Tulsi ñ a potential protector against air travel health problems.Indian J Nat Prod Resour, 2008; 7(1): 54-57.

9. Devade OA, Londhe RD. Medicinal plants with Memory enhancing activity: review. J Pharm Adv Res, 2022; 5(2): 1452-1459.

10. Sharma R, Singla RK, Banerjee S, Sinha B, Shen B, Sharma R. Role of Shankhpushpi (*Convolvulus pluricaulis*) in neurological disorders: An umbrella review covering evidence from ethnopharmacology to clinical studies. Neurosci Biobehav Rev, 2022; 14: 104795.

11. Jalwal P, Singh B, Dahiya J, Khokhara S. A comprehensive review on shankhpushpi a morning glory. J Pharm Innov, 2016; 5(1, Part A): 14.

12. Yadav A, Mishra S, Rajan N, Shashank T. Traditional Utilization and Pharmacological Properties of Medicinal Plants. North West Delhi: Scripown Publications; 2021. pp. 28-45.

13. Sahu R, Dhongade HJ, Pandey A, Sahu P, Sahu V, *et al*. Medicinal properties of Nardostachys jatamansi (a review). Orient J Chem, 2016; 32(2): 859-866.

14. Salve J, Pate S, Debnath K, Langade D. Adaptogenic and anxiolytic effects of ashwagandha root extract in healthy adults: a double-blind, randomized, placebo-controlled clinical study. Cureus, 2019; 11(12): e6466.

15. Cheah KL, Norhayati MN, Yaacob LH, Rahman RA. Effect of Ashwagandha (Withania somnifera) extract on sleep: A systematic review and meta-analysis. PloS One, 2021; 16(9): e0257843.

16. GoldbeteA, Leloup JC. From circadian clock mechanism to sleep disorders and jet lag: Insights from a computational approach. Biochem Pharmacol, 2021; 191: 114482.

17. ZhangF, Li W, Li H, Gao S, Sweeney JA, JiaZ, et al. The effect of jet lag on the human brain: A neuroimaging study. Hum Brain Mapp,2 020; 41(9): 2281-2291.

18. Aktaş S, Ozdemir PG. Effects of chronotype and social jet-lag on neurocognitive functioning. Psikiyatr Guncel Yaklasimlar, 2023; 15(3): 407-417.

19. Jerigova V, Zeman M, Okuliarova M. Circadian disruption and consequences on innate immunity and inflammatory response. Int J Mol Sci, 2022; 23(22): 13722.

20. Burtscher J, Strasse B, Millet GP, Burtscher M. Can melatonin be used as a potential antioxidant and sleep aid supplement for high-altitude travelers. J Travel Med, 2022; 29(5): 198.

21. Torres-Ruiz J, Sulli A, Cutol M, Shoenfeld Y. Air travel, circadian rhythms/hormones, and autoimmunity. Clin Rev Allergy Immunol, 2017; 53: 117-125.

22. Nair L, Lekshmy ML, Chandran H, Irshad H. Ayurvedic perspective of Circadian Rhythm. J Ayurveda Integr Med Sci, 2021; 602: 187-194.
23. Kumar M, Agarwal. A Survey Study to Evaluate the Effect of Ratri Jagarana on Health Wsr to Nidra Vega Dharana. J Ayurveda, 2019; 13(1): 143-149.
24. Mishrikoti PV, Prarthana HM, LamaniT. Role of Dinacharya to maintain Circadian Rhythm for Cell Rejuvenation-A Review. J Ayurveda Integr Med Sci, 2024; 9(6): 73-79.
25. Smith S, Trinde J. Morning sunlight can phase advance the circadian rhythm of young adults. Sleep Biol Rhythms, 2005; 3: 39-41.
26. Patel Y, Wamankar S, Pal S, Chouhan B, Dewangan H, Parveen S, Nema RK. *In situ* gel as an alternative approach for intranasal drug delivery system. J Pharm Adv Res, 2024; 7(4): 2247-2256.

Conflict of Interest: None
Source of Funding: Nil
Paper Citation: Dhiwar P, Hanspal P, Bhattacharya M, Wamankar S*, Nema RK. An overview of Varicose Veins: Pathphysiology, Stages, Treatment and Herbs used. J Pharm Adv Res, 2024; 7(10): 2437-2443.