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INTERPLAY OF FASTING, CIRCADIAN RHYTHMS, AND AYURVEDIC LANGHAN: AN INTEGRATIVE PERSPECTIVE

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Abstract:

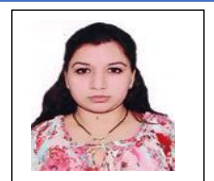
This article explores the convergence of ancient Ayurvedic principles and modern chronobiology, focusing on fasting and the concept of Langan. Ayurveda, the traditional Indian system of medicine, emphasizes the balance of three fundamental doshas (Vata, Pitta, Kapha) and their cyclical dominance throughout the day (doshakala). Contemporary science recognizes the biological clock (circadian rhythm) as a critical regulator of physiological processes. Fasting, particularly time-restricted eating, has gained attention for its health benefits, which align with both circadian biology and Ayurvedic Langan. Langan, a therapeutic lightening method, is prescribed to restore dosha equilibrium and is traditionally timed according to doshakala. This article examines the scientific basis of fasting in relation to circadian rhythms and its parallels with Langan, proposing an integrative approach for health optimization.

Keywords: Circadian Rhythms, Langan Therapy, Doshakala, Time-Restricted Eating (TRE), Intermittent Fasting

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INTRODUCTION:

The comprehensive medical system known as Ayurveda, which translates to "the science of life," was developed in India more than 5000 years ago. It is based on the principle of maintaining balance among three fundamental physiological energies or doshas: Vata (air and space elements), Pitta (fire and water elements), and Kapha (earth and water elements) [1]. Each dosha governs specific bodily functions and exhibits cyclical dominance during a 24-hour cycle, known as doshakala.

The day is divided into six periods, each dominated by one of the doshas:

- Kapha period: 6:00 AM to 10:00 AM and 6:00 PM to 10:00 PM
- Pitta period: 10:00 AM to 2:00 PM and 10:00 PM to 2:00 AM
- Vata period: 2:00 PM to 6:00 PM and 2:00 AM to 6:00 AM [2]

Modern biology has identified the circadian rhythm, an endogenous time-keeping system that regulates various physiological processes, including metabolism, sleep, and hormone secretion, in alignment with the 24-hour light-dark cycle [3]. Organ peripheral clocks are synchronized by the master circadian clock, which is housed in the hypothalamic suprachiasmatic nucleus (SCN) [4]. Disruption of circadian rhythms is linked to numerous disorders, such as obesity, diabetes, and cardiovascular diseases [5]. For millennia, people from many cultures have engaged in voluntary abstention from food for predetermined lengths of time for both spiritual and health-related reasons. Scientific research has elucidated benefits of fasting, including improved metabolic health, enhanced cellular repair (autophagy), and longevity [6]. Time-restricted eating (TRE), a form of fasting where food intake is limited to a specific window (e.g., 8-10 hours) aligned with the circadian rhythm, has

shown promise in improving health outcomes [7]. In Ayurveda, Langhan (lightening therapy) is a key therapeutic approach that involves fasting or reduced food intake to alleviate excess Kapha and Ama (toxins) and restore dosha balance [8]. Langhan is often recommended during specific times of the day, corresponding to doshakala, to maximize its efficacy.

Objective:

- Examine the ideas of the biological clock in contemporary science and the doshas and doshakala in Ayurveda.
- Discuss fasting and its health benefits, particularly in the context of circadian rhythms.
- Explore Langhan as an Ayurvedic fasting method and its relation to doshakala.
- Correlate these concepts and discuss the scientific and logical basis of their interplay.

Fasting: Concept and Health Benefits

Fasting can take various forms, including intermittent fasting (IF), alternate-day fasting, and periodic fasting. Intermittent fasting, which includes TRE, involves cycles of fasting and eating within a day. TRE typically restricts food intake to a window of 8-12 hours, often aligned with the daytime [9].

Health benefits of fasting include:

- **Metabolic Health:** Fasting improves insulin sensitivity, reduces blood glucose, and promotes fat oxidation, thereby aiding in weight management and reducing the risk of type 2 diabetes [10].
- **Cellular Repair and Autophagy:** Fasting induces autophagy, a cellular cleaning process that removes damaged components and promotes cellular renewal [11]. This process is crucial for preventing neurodegenerative diseases and cancer.
- **Inflammation Reduction:** Fasting reduces markers of inflammation, such as C-reactive

protein, and may protect against chronic inflammatory diseases [12].

- **Longevity:** Animal studies show that fasting extends lifespan and healthspan, likely through metabolic and cellular adaptations [13].

The timing of fasting is critical. Studies indicate that TRE aligned with the circadian rhythm (e.g., eating during the active phase) is more beneficial than eating at irregular times [7]. For instance, early TRE (e.g., eating from 8 AM to 4 PM) shows superior metabolic benefits compared to delayed eating [14].

Langhan in Ayurveda:

Langhan, derived from the Sanskrit root "lanch" meaning "to lighten" or "to jump over," is one of the six primary therapeutic strategies in Ayurveda (Shodhana and Shamana) [15]. It is indicated when there is an excess of Kapha or Ama (undigested metabolic waste), leading to symptoms like heaviness, lethargy, and indigestion. Langhan includes methods such as:

- Fasting (complete or partial)
- Light diet (laghu ahara)
- Physical exercise
- Exposure to wind and sun [16]

Langhan is typically prescribed during the Kapha period (early morning and evening) to counteract the inherent heaviness and sluggishness of Kapha. For example, skipping dinner or having a very light dinner during the evening Kapha time (6 PM to 10 PM) is advised to prevent aggravation of Kapha [17]. Langhan aims to ignite Agni (digestive fire) and decrease excess dosha, particularly Kapha. When there is a Vata imbalance and weakness, it should not be used [16].

Correlation between Fasting, Biological Clock, and Langhan:

The alignment of fasting with the circadian rhythm in modern science and

Langhan with doshakala in Ayurveda reveals a remarkable convergence:

Kapha Period and Morning Fasting: The Kapha period in the morning (6 AM-10 AM) is characterized by heaviness and stability. Ayurveda recommends light or no breakfast during this time to avoid aggravating Kapha. Modern TRE often involves delaying the first meal (e.g., skipping breakfast) and consolidating eating within a midday window. This practice aligns with the natural peak of cortisol (which boosts energy) in the morning and the rise of digestive capacity (Pitta) later [18]. Skipping breakfast may thus enhance fat burning during the morning Kapha period.

Pitta Period and Main Meal: The midday Pitta period (10 AM-2 PM) is when digestive fire (Agni) is strongest. This is when Ayurveda suggests eating the greatest meal. Similarly, TRE studies show that eating during the middle of the day (when insulin sensitivity is higher) improves glucose metabolism [19].

Evening Kapha and Fasting: The evening Kapha period (6 PM-10 PM) is a time when digestion weakens. Ayurveda advises against heavy dinners. Langhan could entail eating a light supper or skipping dinner. Modern research supports early dinner or TRE ending by evening, as late eating disrupts circadian rhythms and promotes weight gain [20].

Thus, both systems emphasize eating when digestive capacity is high (midday) and reducing intake when it is low (morning and evening). Langhan, as a tailored fasting method, can be seen as an ancient form of circadian fasting.

DISCUSSION:

Circadian Regulation of Metabolism: The circadian clock regulates genes involved in metabolism, such as those for glucose and lipid metabolism [21]. Eating in misalignment with the clock (e.g., late at night) disrupts these rhythms, leading to metabolic dysfunction [22]. Langhan, by

restricting food during Kapha times, naturally avoids such misalignment.

Dosha-Circadian Parallels: The doshakala periods correspond roughly to circadian phases: Kapha period (morning) aligns with the rising phase of cortisol and body temperature, preparing the body for activity without heavy food. Pitta period (midday) aligns with peak core body temperature and optimal digestive enzyme secretion [23].

Vata period (afternoon) is a time of movement and elimination, which may be supported by light food.

Autophagy and Dosha Balance: Fasting-induced autophagy peaks during the night and is enhanced by prolonged fasting [24]. Langan, by extending the overnight fast (e.g., by early dinner), may promote autophagy, thereby reducing Ama (cellular toxins).

Scientific Validation: A study on TRE (16:8 fasting) showed improvements in weight, insulin resistance, and inflammation [25]. Similarly, Ayurvedic studies report benefits of Langan in obesity and metabolic syndrome [26].

However, individual variation must be considered. Langan is customized by Ayurveda according to a person's constitution (Prakriti) and present condition (Vikriti). For instance, a Vata-dominant individual may not tolerate prolonged fasting and may require modifications. Modern chronotypes (morning vs. evening types) also influence optimal eating windows [27]. Thus, a one-size-fits-all approach is not advocated.

CONCLUSION:

The convergence of Ayurvedic Langan and modern circadian fasting underscores the timeless wisdom of aligning eating patterns with natural biological rhythms. Langan, as an ancient fasting therapy, is strategically timed with doshakala to balance doshas and enhance Agni. Contemporary science validates the health benefits of time-restricted fasting and its

synchronization with the circadian clock. Integrating these approaches offers a holistic strategy for disease prevention and health promotion. Customized fasting schedules based on Prakriti and chronotype should be investigated in future studies.

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