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‘Rtu’ and ‘Rtukāla’: The time to be pregnant exploring Ayurveda perspectives on fertility in literature

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ABSTRACT

The menstrual cycle is a body clock related to the reproductive system that parallels with other environmental cyclical phenomena. The analysis of dynamic aspects of the menstrual cycle can be traced across vast Ayurveda literature. They are highly valued within the Ayurveda tradition for maintaining wellbeing of the self and progeny and mitigating personal and social misconceptions related to menstruation. This article focuses on a three-way categorical identification of the menstrual cycle based on *Doṣa* behavior, facilitating personal and clinical cycle adjustment. A novel concept, FOAD (Fetal Oriented Adult Diseases), is compared with the cyclical change of seasons (*‘Rtu Parināma’*) and transitional periods of seasons (*‘Rtu Sandhi’*). This comparison emphasizes how the overarching influence of *‘Rtu’* (seasons) and their associated environmental stimuli impact biological processes, including the menstrual cycle, and significantly, how these same stimuli can collectively affect the developing fetus. Further, in this article, *‘Varṇa Paddhathi’* based changes of the menstrual cycle are evaluated epistemically through modern molecular biology. *‘Rtuchakra’*, is broadly elaborated highlighting key review gaps concerning its comprehensive understanding, addressing these gaps can inform and structure counseling practices across three distinct phases: pre-conceptual, gestational, and post-partum, for individuals seeking optimal progeny health. Through a study of ten key physiological and environmental aspects related to *Rtu* and its influence on female health this article aims to bridge traditional Ayurvedic knowledge with modern medical understanding to provide insights for improved women’s health and counseling practices related to menstruation, thereby enhancing the understanding of the menstrual cycle from an Ayurveda perspective, empowering young women through insightful reproductive health education, and fostering research and promoting informed healthcare practices.

KEYWORDS:

Rtu kāla, FOAD, Estrous-Signs, Niyatakāla Siddhanta, Archetypes menstrual cycles, better progeny, Fertility in Ayurveda, Women’s Health

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Introduction

The menstrual cycle, a fundamental aspect of the female lifespan, involves complexities often overlooked in conventional explanations in modern medicine. Research suggests (Le, Thomas, & Gurvich, 2023) that current explanations of the menstrual cycle often overlook its intricate interplay with hormonal fluctuations, societal expectations, and individual experiences. According to Barrington et al. (2021), experiences of menstruation vary across different income levels (Le, Thomas, & Gurvich, 2023; Barrington et al., 2021). The menstrual cycle, or '*Rtuchakara*', implies a body clock situated primarily in the reproductive system. It corresponds to the seasonality of the cyclic rhythms of the environment. Healthy cycles create healthy progeny if minimal stressors are maintained in each phase of a cycle. A common view is that bringing consciousness to and care for each internal physiological 'season' or phase of the cycle in turn prevents the external stressor and facilitates the identification of its unrhythmic manifestations. The process is uncomplicated if one knows the fundamentals of the regularity of an 'archetypal menstrual cycle' and where adjustments and due professional and self-care are needed.

Up until the recent past, women in Asian societies mentally mapped the phases of each menstrual cycle, drawing upon wisdom passed down through generations. They synchronized their lifestyles to the phases of the menstrual cycle and in turn with the seasonal patterns. This was done in hopes of ensuring the mental and physical health and wellbeing of themselves and their offspring that might be born in an iteration of the cycle. However, with modern lifestyles, such awareness is waning. Modern-day young females are faced with menstrual discomfort and unplanned pregnancies owing to their lack of awareness in menstruation and the fundamentals of cyclic changes. Such a lack of awareness not only leads to unhygienic and unhealthy menstrual practices, such as improper disposal of sanitary products or prolonged use of a single product, but also fosters misconceptions and negative attitudes, potentially leading to shaming, bullying, and gender-based violence (World Bank, 2023).

This article hopes to provide valuable information for health workers in their counselling and clinical sessions and thereby contribute to educating the public on good sexual practices related to menstruation aimed at a healthy progeny. The findings reveal personalized pathophysiological variabilities in menstrual cycles, and understanding these is crucial, as the prime aim, concerning menstruation, is the excellence of offspring measured through the health and wellbeing of today's youth. In contrast, the '*Rtu*' and '*Rtukāla*' highlight the need of synchronizing lifestyles according to the phases of the menstrual cycle, imparting the best effect of the four seasonal cycles for female wellbeing. Findings obtained through in-depth study of Ayurveda literature relating to menstruation and menstrual cycles along with their analyses provides effective information for further research and holds the key for spreading awareness among the public beyond a focus on the fetus.

To confirm the assumption that synchronizing lifestyles with the phases of the menstrual cycle (*‘Rtu’* and *‘Rtukāla’*) imparts optimal female wellbeing, this article evaluates the fundamental theories behind the menstrual cycle, specifically the ten aspects of *Rtukāla*. Drawing from original Ayurveda texts and scientific literature, this evaluation demonstrates how this knowledge is applicable in counselling settings for promoting women’s health and family planning, and highlights its usability in further research.

In this way, this article aims to first analyze the Ayurveda concepts of *Rtu* and *Rtukāla* and their underlying theories, as well as address potential gaps in the interpretation of the ten aspects of *Rtukāla* etymologically, conceptually and physiologically. Specifically (and first), the analysis in this article will provide an operational definition of the ‘ten aspects of *Rtukāla*’ as utilized in this study. Second, it aims to evaluate the practical application of knowledge related to menstruation in health worker counseling and clinical sessions, incorporating a clearly defined depth of epistemological evaluation to bridge Ayurveda and modern medical perspectives. This evaluation will address the current lack of specificity in how Ayurveda and modern medical knowledge are integrated in the field of reproductive health. Third, the article explores the role of swerving *Doṣa*, environmental stimuli (*Rtu Sandhi* and FOAD (Fetal Oriented Adult Diseases), and social factors (*Varṇa Paddhati*) in influencing the menstrual cycle. Fourth and finally it identifies review gaps within the academic literature that, when illuminated by this review, require further investigation concerning modern societal menstrual knowledge and practices and emphasize the clinical importance of *Rtuchakra* education for improved health of progeny.

Although the literature provides studies of the term ‘*Rtuchakra*’ in detail with regard to the menstrual cycle, this study finds that further attention should be paid to analyze this with categorical identification of phasal differences of the menstrual cycle into the ‘swerving *Doṣa*’ other than the ‘fixed pattern of *Doṣa* concept’. The effects of environmental stimuli and their affiliation of ‘*Rtu Sandhi*’ and FOAD were also observed in this study. Explaining the diversity of ‘*Varṇa Paddhati*’ is crucial to understanding its profound implications. This ancient epidemiological framework broadly identifies inherent predispositions within specific population strata. Analogous to the stratified, ordered flow of water through ancient Sri Lankan cascade tank systems, this system suggests a similar propagation of gene pools and influences across societal layers and successive generations. It posits that these inherent predispositions contribute to observed health parameters, such as variations in menstrual cycle day counts. While these connections were historically addressed through holistic practices like lifestyle adjustments and spiritual conduct—paralleling contemporary personalized medicine and epigenetic interventions—their precise scientific mechanisms, including their relation to Ribonucleic Acid (RNA) coding

to Deoxyribonucleic Acid (DNA) for required adjustments to protect offspring, have yet to be thoroughly elaborated using modern research methodologies. This gap persists despite such insights being alluded to in ancient Samhita texts.

This study further identifies the review gaps and clinical importance of effective education of *Rtuchakra* in the pre-marital, marital, and post-natal counselling phases for holistically healthier progeny, and addresses this to support Ayurveda clinicians in providing more informed and effective counseling.

Materials and Methods

This study addresses ten aspects of the concept of *Rtukāla* through analysis and review of facts in the relevant chapters of original Ayurveda texts and research articles found using the following keywords: Medical Subject Headings (MeSH) qualifiers such as ‘Reproductive Health AND Ayurveda,’ ‘Seasonal Influence AND Female *Rtuchakra*,’ and ‘*Agni* and Menstrual Health’; along with entry terms and synonyms including ‘Menstrual Health,’ ‘Menstrual Irregularities,’ ‘Menstrual Blood Loss,’ ‘Premenstrual Dysphoric Disorder,’ ‘*Rtu*,’ ‘*Rtu Chakra*,’ ‘*Artava*,’ ‘*Bījotsarga*,’ ovulation, female age, oocytes, fertility, ‘*Rajovyatitakāla*,’ ‘*Rtusrāva Kāla*,’ changing *Doṣa*, , ‘*Rtumatī*,’ ‘estrous signs,’ fetal origins of adult diseases, ‘*Rtu Parināma*,’ and ‘*Rtu Sandhi*’. Sources were retrieved from PubMed, JSTOR, Google Scholar, and ResearchGate, covering the period from 2022 to 2024.

Articles were selected based on relevance of content and their potential to facilitate meaningful comparison with original Ayurveda texts. This involved selecting articles in which the concepts that were discussed or findings could be directly related to, contrasted with, or contextualized within Ayurveda principles and theories of *Rtu* and female reproductive health.

Once selected, articles underwent fact-checking using reverse referencing (tracing citations back to their original sources) for epistemic validation. This method ensured the accuracy of references. The study primarily utilized data from Ayurveda texts and contemporary medical literature.

The following criteria were used when including articles. Peer-reviewed articles that discussed menstrual health and female reproductive health in relation to Ayurveda concepts were included. Ayurveda texts and commentaries addressing *Rtuchakra*, *Rtukāla*, and related concepts were also included. Studies addressing menstrual disorders with an emphasis on Ayurveda treatment, studies that explored the influence of seasonal cycles on menstruation within the Ayurveda framework and studies including MeSH terms such as ‘Menstrual cycle,’ ‘Reproductive health,’ ‘Ayurveda’ and ‘Seasons and menstrual cycle’ were considered. Additionally contemporary medical research connecting Ayurveda practices with modern understandings of reproductive health and other literature in English, Sinhala, and Sanskrit, exploring the intersection of Ayurveda and menstrual health

were also included. The exclusion criteria included non-Ayurveda perspectives, insufficient cross-disciplinary textual comparison, a solely pathological focus, unclear analysis of the ten focused aspects, and an exclusive modern medical focus.

The findings that emerged were organized according to the ten aspects of *Rtukāla* and presented under subheadings in the discussion. Concepts highlighted in the literature were compared with each other and against contemporary biomedical perspectives to provide a comprehensive understanding of *Rtukāla*'s implications for menstrual health, fertility, and overall female well-being. The study concluded with a synthesized finding of the discussed literature, arranged in a logical order, and thorough proofreading to ensure language clarity. Language clarity was specially considered to facilitate a precise, nuanced understanding of Sanskrit terms, which are crucial for an appreciation of their traditional meaning that often cannot be directly conveyed through English translation. This approach provides valuable input for the field of reproductive health and specifically for readers interested in these interdisciplinary concepts related to menstruation and female fertility, supported through the judicious use of diacritics.

Sanskrit Diacritics and Approximate IPA (International Phonetic Alphabet) Equivalents that were relevant to this study were:

- R (ṛ): IPA: [r] (a syllabic r) or [ri] (a short 'ri' sound);
- N (ṇ): IPA: [ɳ] (retroflex 'n');
- Ś (ś): IPA: [ɕ] (voiceless alveolo-palatal fricative);
- Ṣ (ṣ): IPA: [ʂ] (retroflex 's');
- Ā (ā): IPA: [ɑ:] (long 'a' sound);
- Ī (ī): IPA: [i:] (long 'i' sound); and
- Ū (ū): IPA: [u:] (long 'u' sound).

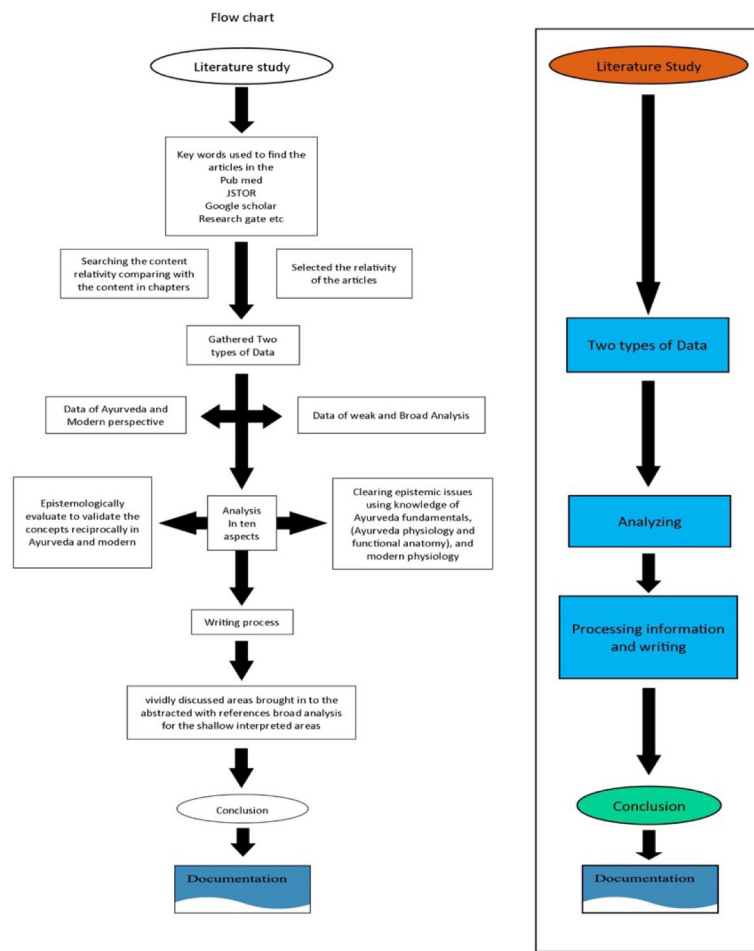


Figure 1: Flow Chart - Materials and methods

The sections that follow will review and discuss various aspects of *Ṛtu* and *Ṛtukāla*. Initially, the fundamental definitions and etymology of *Ṛtu* are explored, followed by an analysis of the importance of its correct identification for precise conceptual understanding and subsequent application. Subsequently, the impact of age on fertility, the significance of *Ṛtukāla* awareness for conceiving progeny, and the two, three, and four-phased classifications of *Ṛtu* based on *Doṣa* influences are examined. Furthermore, the '*Ṛitumatī*' (estrous) signs and the connection between *Ṛtu* and the concept of FOAD are discussed. The final section concludes with a focus on the clinical importance of *Ṛtukāla* and *Ṛtuchakra*.

Literature review and discussion

What is 'Rtu' (ऋतु)?

Female life, starting from menarche to menopause, indicates the possibility of conception due to the phenomenon of menstruation. *Rtu* has been defined in many different ways across different cultures and texts. In the ancient trilogy of *Vrihatrayee* in Life Science, the term *Rtu*, is correlated to menstruation as well as to the four seasons of the environment (Hardwicke-Collings, 2021). Etymologically, *Rtu*, refers to 'seasons' in English as equal to the traditional Indian calendar (Singh, Tripathi, & Byadgi, 2012). *Rtu* (ऋतु) also refers to 'sexual energy' (of the female consort) in Shaktism (*Shakta* philosophy). In Hindu mathematics *Rtu* represents the number six in the 'word-numeral system'. The Sanskrit dictionary (Wisdom Library, n.d.) also defines *Rtu* as an epoch, and any fixed or appointed time period, among other meanings in the Sanskrit dictionary.

Menstruation causes menstrual discharge. It begins a period favorable for conception. In Sanskrit dictionaries (Wisdom Library, n.d.) *Rtu* encompasses suitable seasons, opportune times, set orders, light, splendor, and months. Traditional Sanskrit texts and their commentaries also link it to the name '*Vishnu*', the number six, and a type of kohl. Etymologically, *Rtu* can refer to 'menstrual discharge' (*Mahabharata* 14, 2739. 5) and 'the season approved for sexual intercourse' (*Mānavadharmasāstra* 3, 46, sqq). Beyond these figurative associations, *Rtu* also literally means pertaining to, being dependent on, or accompanying the seasons or a specific period of time (Wisdom Library, n.d.).

Rtu or '*Artava*' are explainable in a similar context relating to the seasons, the four 'Inner seasons', metaphorically on par with the external environment. The cyclical changes associated with *Rtu* are perceptible, exert discernible psycho-physiological effects, and necessitate biological and psychological adaptation.

Beyond biological renewal for a new reproductive cycle, the commencement of a new menstrual cycle is, from the perspective of established, traditional (Ayurveda) wisdom, a vital period for a female's holistic well-being. This phase requires mental adaptation to hormonal fluctuations and accompanying physical changes, fostering an inwardly focused spiritual and emotional renewal to mitigate discomfort and maintain psycho-physiological balance, and processing any unfulfilled expectations of pregnancy from the previous cycle. These efforts collectively contribute to overall well-being during the menstrual period and facilitate the navigation of social considerations, such as prevailing stigmas and discriminatory practices.

This holistic approach fosters a natural sense of regained vitality and enthusiasm, marking a restoration of both bodily and mental readiness for the ensuing period. Understanding the menstrual cycle through this comprehensive framework is essential, particularly for young women, in their formative years, as it reveals its full impact on their overall health, emotional resilience, and societal engagement.

The four phases of menstruation are menstrual (*Ṛtusrāva-Kāla*), pre-ovulatory (*Ṛtumatī-Kāla*), ovulatory (*Bijotsarga-Kāla*) and luteal or premenstrual phases (*Rtuvyatita-Kāla*) (Aishwarya, 2022). This is similar to the four seasons winter, spring, summer and autumn experienced in the natural environment in some parts of the world (Hardwicke-Collings, 2021). This comparison aligns with the similar features and energy levels found in both the internal and external environments. Specifically, this pertains to the energetic interplay between the menstrual cycle and the distinct energy profiles of the four environmental seasons. Further, it assumes the form of a convergence of ritual acts, spiritual events, symbolic gestures, and creative expressions of a Hindu female in expectation of cohabitation for a pregnancy. (Garbhadhana Samskara; Sarkar, 2020 p. 2-3)

In Ayurveda obstetrics, *Ṛtu* refers to both the fertile window for conception and the duration to follow appropriate measures for optimal conception and healthy progeny. Thus, it is defined through the synonyms *Artava*, *Śonita*, *Asrik*, *Raja*, *Rakta*, *Lohita*, *Rudhira*, and *Pushpa* (Kulkarni et al., 2021) which translate to ovum, menstruation and menstrual blood. In '*Rutau Bhawati artavam*' the word '*Rutau*' and '*Bhavam*' refer respectively to two meanings, which are a particular or specific time period and an occurrence or a taking place (of *Ārthava*). In '*Rtuchakra*', the word '*Chakra*' defines the constant onset at regular intervals, just like a cycle. Moreover, '*Rtu chakra*' signifies the cyclical nature of the menstrual cycle, with each cycle spanning one lunar month (Chandramāsa).

Ṛtu also encompasses the physiological functioning of the female reproductive system (Kulkarni et al., 2021). Dalhana, in Susruta Śārīra Sthāna 2/36, describes the characteristics of '*Ārtava*' in the sense of an ovum; less in quantity (*Alpa*), coagulated (*Styanibhūta*), minute (*Sukṣma*), and immobile (*Asancāri*). '*Rajas*,' or menstrual blood, according to Vāgbhata in Aṣṭāṅgahrdaya Śārīra Sthāna 3/81, is typically around four Anjalī or 35 ml (Magnay et al., 2018; Wadoodkhan, 2016) and varies among individuals. Current research suggests an average menstrual fluid volume of 35 ml during a period, with a range of 10-80 (Carlson, Eisenstat, & Ziporyn, 2004) ml. Across an average of 450 periods in a woman's lifetime, this results in approximately 5-6 years of total bleeding and a plasma and blood volume loss of 15,750-36,000 ml (Thiyagarajan et al., 2023).

Ayurveda texts describe menstrual blood (*Ārtava* or *Rajas*) as possessing primarily '*Āgneya*' properties, indicating a predominance of the '*Teja*' element as mentioned in Susruta Samhita Sūtra Sthāna 14/7 (P144) and Sushruta Samhita, Śārīra Sthāna 3/3, (p140) (Sharma, 2000). This implies a hot, light, and mobile nature. While other elements (*Mahābhūtas*) are present in minute form, the dominance of '*Teja*' is believed to influence its functions. The text Susruta Śārīra Sthāna 3/3 further suggest that '*Ārtava*' resembles blood and plays a crucial role in various processes, including generating the embryo that leads to pregnancy, formation of breast milk and ultimately promotes the creation and sustenance of another life.

The formation of '*Rajas*' in a female originates from '*Rasa Dhātu*' (the first tissue formed out from the digested juice), considered the first precursor element to menstruation. (Sharma & Das, 2000, Caraka Samhita, Chikitsā Sthāna 15/17, pp. 11–12) This process involves the transformation of tissues (*Dhātu parināmana*) and is traditionally understood to culminate in the formation of *Rajas* over the course of one month (Sharma & Das, 2000, Caraka Chikitsa 30/225, p. 118; Susruta Samhita, Śārīra Sthāna 3/10, p. 142). This physiological understanding is also supported by analytical reviews from contemporary scholars (Patwardhan et al., 2020). However, some scholars, like Dalhana, propose a different timeline, suggesting that menstrual blood (*Rajas*) is formed as a byproduct of metabolism of '*Rasa Dhātu*' on the seventh day of the *Rasa Dhātu*'s transformation cycle (Sharma, 2000, Su. Sa. Sūtra Sthāna 15/5, p. 158). This early-stage *Rajas* is believed to provide the seat and initial nourishment for a potential embryo.

In summary, '*Rtu*' is a multifaceted concept extending beyond seasonal definitions to encompass opportune biological timings crucial for female reproductive health. This section explored its diverse etymological, symbolic, and physiological interpretations. Understanding '*Rtu*' as a dynamic interplay between internal and external environments provides a foundational lens for comprehending female well-being within traditional perspectives.

Importance of identification of '*Rtu*'

'*Rtu*' or '*Rtukāla*' serve two distinct purposes in Ayurveda: identifying the timeline of ovulation (*Bijotsarga*) and its fertilization (*Garbhadhana*) (Radhakrishnan, 2018). The term '*Bīja*' stands for '*Ārtava*', meaning the ovum (Kulkarni et al., 2021; Gore & Kulkarni, 2015; Aishwarya, 2022; Agrawal et al., 2021). In a typical 28-day menstrual cycle, ovulation usually occurs between days 12 and 16 (Mohanty et al., 2018). Ovulation starts with the changes of the uterine environment, similar to cyclic changes of the seasons in the year, just as *Ārtava* is synonymous with *Rtu*, the season. (Shridevi & Shreevathsa, 2018). These changes culminate in the shedding of the uterine lining as menstrual blood, marking the beginning of a new monthly cycle. Thus, it is important to understand that *Rtu* refers to '*Bijotsarga*,' or ovulation, which happens through the cyclical changes in the uterine environment.

Secondly, '*Rtukāla*' is characterized by the proliferation of endometrium, concurrent with the formation of the ovum and the conceptus ('*Garbhadhana*'), progressing within the 12 to 16-day period of ovulation. This physiological phase aligns with the appropriate age for undergoing a healthy pregnancy. According to Arunadatta, a commentator on Ashtanga Hridaya (Yerawar et al., 2019), menarche—the first occurrence of menstruation, signifying the onset of reproductive capacity—may typically occur around 11 years of age, with individual variations. Thus, the

second purpose of identifying *Rtu* is to be aware of timelines, mentioned as *Rtukāla*, which highlights the desirable period for conception (*Garbhadhana*) without any defect of the progeny (Agarwal, 2021).

As a whole, the *Rtu* is identified as the season that stands for ovulation, conception and the commencing point of the progression of embryogenesis of the female. This phase of the cycle acts upon the high follicular secretions required for ovulation along with estrogen for endometrial formation. This stage is considered a physiologically high-energy phase for females within the menstrual cycle.

The Impact of Age on 'Rtu', Oocyte Quality and Quantity, and Female Fertility

Age is a determinant cause for reproduction. *Rtu* exhibits the best phase of reproductive age starting from puberty and after menarche. It is called the age during which it is precious to be pregnant – '*Garbhadhāna yogya kāla*' - because at this age the female acquires the strength and stamina, necessary for successful conception and healthy childbearing '*Sampūrṇa Vīrya*'. This resembles flowering and fruiting of a plant after reaching its maturity. If the standard physical maturity is reached (females at 16 years and males 25 years), they may procreate a healthy child. Recent research, however, reveals that the reproductive age falls between 15-49 years which seems to add extra years setting new physiological parameters for pregnancy (Bhagat et al., 2017). The same age range has been stated in the 14th chapter of the Susrutha Samhita Sūtra (Sharma, 2000, Chapter 14, p. 142, pp. 147–148).

Starting from the age of reproductive maturity (menarche), female fertility decreases with maternal aging, resulting in a risk of female infertility in the later stages. A woman is born with a finite number of oocytes (immature egg cells), and this ovarian reserve gradually declines throughout her reproductive lifespan. While the decreasing oocyte number contributes to declining fertility, this decline is also significantly due to the presence of an abnormal number of chromosomes in female gametes (aneuploidy) and similar conditions (Dhiman, 2010; Islam, 2015). A woman's fertility peaks in her early and mid-20s, and in her late 20s years), after which it gradually declines to a more dramatic drop at around 35 years (Hall, C. T., 2002). In other words, the prevalence of infertility increases between 25 to 45 years in a range from 1% to 55% respectively (Islam, 2015).

The aging woman loses the chromosomal competency of her ovum, and it can never be implanted as a fertilized ovum (Bhagat et al., 2017; Kumar et al., 2018). At birth, there are one to two million viable oocytes remaining through fetal development; at the time of puberty, a female retains only 300,000 to 500,000 of those oocytes. During 35 to 40 years of a woman's reproductive life, she will ovulate 400 to 500 of these oocytes and the rest will be lost to atresia (a process of natural degeneration of ovarian follicles). The ovary has no capacity to regenerate oocytes. In a woman's biological clock, menopause marks the physiological cessation of

fertility, the phase in which reproductive activity is completely ceased. This is in stark contrast to the male, who from puberty can produce over 100 million sperm a day a capacity that generally continues throughout life, though age-related changes in sperm quality and quantity are recognized (Harris, Fronczak, Roth, & Meacham, 2011) Therefore, this discussion underscores how the limited and age-dependent nature of female oocyte quantity and quality, often understood through the framework of *Rtu* principles, significantly impacts a woman's fertility across her lifespan.

Awareness of '*Rtukāla*' for better progeny

Awareness of '*Rtukāla*' could allow manifestation of certain physiological and psychological changes in a female to conceive a healthy progeny. Conception on successive days of *Rtukāla* could bear a child with a long life span, Conception on successive days of *Rtukāla* could bear a child with a long life span, robust physical vitality (reflecting 'stamina' and 'better complexion' as per Ayurvedic texts), and qualities highly valued in traditional contexts such as fortune and wisdom (Sharma, 2014; Bhishagratna, 2010; Patil & Somashekar, 2017). Contrarily, a conception in post *Rtukāla* (Kumar et al., 2018; Patel & Gupta, 2021) will result in progeny with diminished health, vitality, or longevity. Therefore, the significance of *Rtukāla* lies in the fact that it is favorable for conception. Both the female and male have to be in the recommended age in this case, and as Caraka says, if a woman below 16 years is impregnated by a man below 25, she will not conceive (Caraka Samhita, Sharira Sthāna, p. 466, 2004). Such cases will result in intrauterine death of the fetus or if the child is born, the child would not live long or will have weak organs, be of ill health, and have malformed body parts, among other deficiencies. Thus, awareness of *Rtukāla* could aid to avoid bearing psycho-pathological and socially under-valued progeny.

Classical Ayurveda texts, as compiled and translated by Sharma (2000), present slight differences in counting the days of *Rtukāla*. According to Susruta, for instance, the duration of *Rtukāla* is 12 days (starting from the 4th day of cessation of menstruation), a period considered best for gathering the seeds (sperms) and the opportunity of pregnancy (Sharma, 2000, Śarīra Sthāna, Chapter 3, p. 141). If a female is prepared for healthy conception (*Garbhadhāna*), cohabitation should take place within 12-16 days of the *Rtukāla*, the average ovulatory period and the average estimated period for conception. The first three days of menstruation is omitted due to the menstrual blood flow, and the 16th day, the last day of *Rtukāla* is omitted due to the closing up of the *Yoni* – the cervix (as discussed by Bhavaprakāśa, Haritha, and Videha; cited in Kulkarni et al., 2021; Mohanty, Dash, & Panigrahi, 2018).

As suggested in the '*Vṛhatrayi*' and the 'Kashyapa Samhita', the 14th day from the commencement of the 28-day menstrual cycle is the last day of the cycle. The 15th day should be omitted for conception through sexual union, as the cervix

naturally closes. Kulkarni et al., 2021; Mohanty et al., 2018). Cyclical changes differ among females due to many reasons. Therefore, Dalhana, in his commentary on Sushruta Samhita states (Acharya, 2014, Sharirasthāna 3/9, p. 351), considering the *Rtukāla* (follicular phase), in general, continues for 16 days of a standard cycle, the first three days should be omitted due to menstruation and the last due to cervical closure (Nagar et al., 2022). It is commonly accepted that the last phase (Luteal) is not recommended for physical and emotional union for conception.

Literature reveals that many physiological parameters such as ‘*Doṣa*’, ‘*Kāla*’ (time or season) and environment (*Deśa*) influence *Rtukāla*. It can be seen that some other division appears in the fifth chapter of the Kashayapa Samhita *Jātisūtra* (*KSj*) and the Bhāva Prakāśa Pūrvakhanda (BP) 3/2 based on ‘*Varṇa Paddhathi*’ (*VP*), understood as traditional social classifications or demographic strata derived from ancient societal categorizations. According to the *KSj*, females in Brahmana VP usually gets *Rtukāla* of 12 days while BP says 12 nights. In ‘*Kṣatriya*’ VP, it is 11 days as per the *KSj* and ten nights according to the BP (Kulkarni et al., 2021; Mohanty et al., 2018). Hence, VP implies inherent physiological distinctions associated with these traditional groupings. While VP, as a societal categorization, is no longer applied in practice, the underlying principle of personalized physiological variations that it implies remains central to contemporary Ayurveda medicine. This is particularly evident through the concept of ‘*Deha Prakriti*’ (human body types), as presented in Caraka Samhita (Vimana Sthana, Chapter 8) and Sushruta Samhita (Sharira Sthana, Chapter 4). This framework has been significantly validated by current research for personalized identification of human populations. which current research has significantly validated as a framework for personalized identification of human populations. Thus, the intuitional knowledge of sages like Kashayapa in differentiating menstrual cycle variations across traditional groupings can now be understood through the lens of personalized Ayurveda assessment. Sages like Kashayapa have claimed intuitional knowledge in differentiation of the days set for ovulation.

Space and time are excellent criteria to measure internal changes of living beings. Biological variability, in greater extent, is influenced by various geographic, (Petwal, Sawhney, & Priyanka, 2022) spatial (*Deśa*) and seasonal factors in a particular territory. The environmental stimuli develop the RNA coding in the body to the DNA (Pai & Luca, 2019) to adjust living beings for survival and protection of their offspring, facilitating necessary constitutional adaptations. Thus, ‘*Aārtava*’ and ‘*Rtukāla*’ are associated with *Prakṛti* (body constitution), a relationship influenced by the factors of *Jāta Śarīra Prakriti* mentioned in Caraka Indriya Sthāna 1/5. This also aligns with the deeper implication of *Varṇa Paddhati* (VP), an ancient system that points to generationally clustered family origins of body types and their associated disease predispositions (Kulkarni et al., 2021; Mohanty et al., 2018). While no longer

a societal categorization, its underlying principle of lineage-based personalized physiological identification continues to be recognized and scientifically explored through concepts like *Deha Prakriti* in contemporary Ayurveda medical education and research.

The two phased classification of Rtu: The observable phenomena of Rtu

Some authors consider *Rtukāla* to represent the entire 28-day menstrual cycle, extending beyond just the fertile window (Kulkarni et al., 2021; Agrawal et al., 2021). Observably, the *Rtukāla* (*Rtu chakra*) can be divided into the *Druṣṭa Ārtava Kāla* (period of visible menstruation; synonymous with '*Rajasrāvakāla*') and *Adruṣṭa Ārtava Kāla* (period of invisible menstruation; synonymous with '*Rtuvayatitakāla*'). In this context, *Praduṣṭha Ārthava* (unhealthy ovum) and *Śudda Ārthava* (healthy ovum) are observable phenomena for examination of the quality of *Bīja* or the ovum. The *Śudda Ārthava* brings the characteristic signs suitable for a healthy progeny. Through this explanation some authors highlight that there is a period of invisible *Ārtava* (female reproductive essence) as well (Sharma, 2000, Sushruta Sharira, Chapter 3, p. 141; Kuldeep Kumar et al., 2018).-

On the other hand, the influences of the two phases of estrogen (peri ovulatory and ovulatory) and progesterone (luteal) are explained in medical biology. The ovulatory phase (typically 3-4 days long) marks the period preceding the peri ovulatory phase, during which the matured follicle develops to rupture, and excretes the oocyte with some granulosa cells into the oviduct. From this point, the oocyte is competent to undergo fertilization. The last phase after ovulation continues for a fixed number of days, usually 13-14 days. In the absence of conception, the menstruation expels old endometrium for 3-5 days and then begins the new cycle. Accordingly, menstruation marks the end of the luteal phase.

Three phased classification of Rtu: Doṣa influence on 'Rtu-Chakra' and the fixed pattern of 'Doṣa'

'*Rtuchakra*' is a cyclical change females undergo similar to the seasonal manifestation of *Doṣa* in the external environment. This cyclical change manifests multiple times throughout a female's lifespan. Age and the living environment directly affect the health of *Rtuchakra*. Three *Doṣa* play equal roles to maintain the three major phases of the *Rtu*. '*Kapha Doṣa*' (the energy and matter associated with stability, structure, and lubrication) (e.g., body mass, joint fluid, tissue formation, immune function) becomes prominent in *Rtukāla* (Madona Baby et al., 2021; Shridevi & Shreevathsa, 2018; Kulkarni et al., 2021; Pournima, 2014) or '*Rajokāla*' (menstrual period) of *Rtuchakra*. When the period of '*Kapha Doṣa*' concludes, the next phase of '*Pitta Doṣa*' (*Pitta Pradhāna*) (the energy and matter associated with transformation, metabolism, and thermoregulation (e.g., digestion, hormone production, body

temperature) takes place. This corresponds to the '*Rtuyatita Kāla*' or '*Rajovyatita Kāla*', a fixed period of 9-13 or 15 days within the cycle. Subsequently, the '*Rtusrāva Kāla*' begins, during which '*Vāta Doṣa*' (the energy and matter associated with movement, communication, and regulation (e.g., nerve impulses, sensory perception circulation, respiration, waste elimination) is prominent. *Rutukāla* ends with the natural closure of the cervix. This is explained through a metaphor, akin to the natural closing of a lotus flower at the end of the day, where the uterus contracts after the period of conception is over (Sharma, 2000, *Sūtra Sthāna* 3, p. 142). As such, the uterus would no longer accept a seed for germination till the next season as the seeds sown after its appropriate season are unable to generate progeny (Adhakrishnan et al., 2018).

Rtuchakra is manifested by reproductive hormonal changes in the female body. Modern biology explains the progression of hormonal phases in the menstrual cycle and the nature of cervical mucosa which undergoes changes with the effect of estrogen during the proliferative phase. During this phase, when the cervix is at its highest value of estrogen, the body ovulates, and the mucosa permits the penetration of sperms. In the second phase, under the effect of progesterone, sperm penetration is hindered (Thiyagarajan, Basit, & Jeanmonod, 2023). Therefore, for conception, cohabitation should take place every 48 hours during the fertile period i.e. 10 to 18 days after the onset of menstruation (Bhagat et al., 2017). This phenomenon proves the impossibility of conception in two different phases within a single menstrual cycle, and consequently, the inconceivability of two separate deliveries stemming from a single gestational event with a notable time delay. In a healthy body, '*Thridoṣa*' (the three fundamental, dynamic principles of energy and matter that orchestrate all physiological and psychological functions within the body) progresses in a fixed cyclical pattern in any daily act. It is seen in physiological acts such as consuming food, in digestion, and sleep, as well as in the phases of the life cycle from birth to death, during the progression of day and night etc. This 'fixed natural pattern' concept of *Thridoṣa* or the '*Niyatakāla Siddhanta*' in Ayurveda, explains how *Doṣa* behave in a predictable, rhythmic order throughout the day and night, corresponding to three distinct phases - beginning, middle, and end. They are respectively named as *Ādhya*, *Madhya* and *Antya* and in *Doṣa*, respectively as, *Kapha*, *Pitta* and *Vāta*. Accordingly, the three phases of the menstrual cycle (*Rtuchakra*) i.e. *Rutukāla*, '*Rtuyatita kāla*' and '*Rtusrāva Kāla*' and *Thridoṣa* follow the same behavior

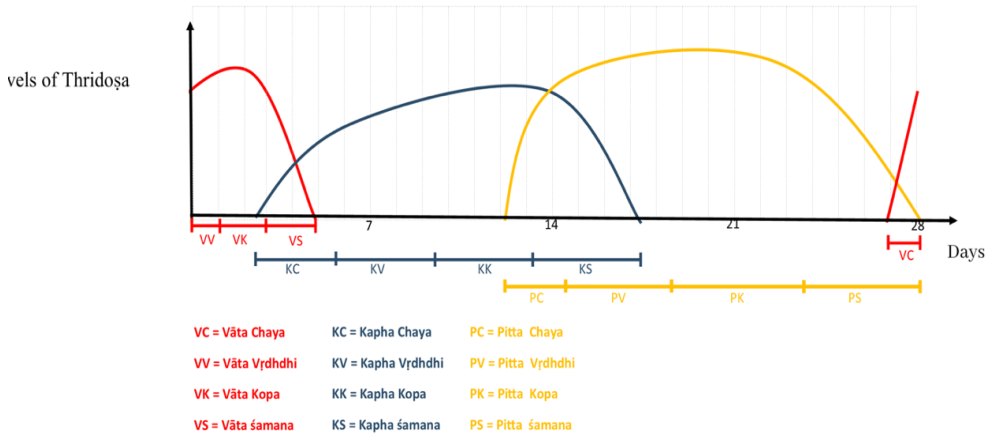


Figure 2: Doṣa influence of Ṛtuchakra and the fixed pattern of Doṣa (FOBT - archetypal type1)

In *Ṛtukāla*, there is the formation of ‘*Navaraja*’ or, the new ovum, because of the dominance of properties of *Kapha*, symbolising an anabolically sound phase. *Kapha* increasing food and behaviors in *Kapha Prakṛti* (an individual’s innate constitution where *Kapha Doṣa* is dominant) females can prolong *Ṛtukāla*, which constitutes the first phase. This observation aligns with the ‘*Sāmānya Siddhanta*’ (Sharma & Das, 2002, Caraka Samhita, Sūtra Sthāna 1/44, pp. 26–32), as a connection between *Ṛtukāla* and excessive *Kapha* has been observed (Saini, Sharma, & Sharma, 2021).

Ṛtukāla is followed by the commencement of the ‘*Ṛtuyatita kāla*’ where the temperature of the female body increases to some extent, as per the concept of ‘*Niyatakāla*’ in which ‘*Pitta*’ becomes dominated. An excess of any *Doṣa* in any phase, due to leading an unwholesome life regimen, results in an imbalanced menstrual cycle which entails imbalanced symptoms of menstrual bleeding.

With regard to physical needs, *Doṣa* undergo a natural increase (*Ulbanatā*) in their physiological activity and prominence in their respective sites and phases. To maintain the *Niyatakāla*, which involves balancing the *Thridoṣa* within its physiological limits, the same *Doṣa* needs to subside in later stages. (Sharma, 2003). As Saini M. et al. (2003) writes, quoting Chakrapani, (e.g., as discussed in his commentary on Caraka Samhita) this temporary excess should not be considered a diseased state, but rather to be in accordance with natural law. The term ‘excess’ here should be interpreted within a specific context.

Awareness of the fixed-order behaviour of *Thridoṣa* (FOBT) can practically be applied to have a healthy menstrual cycle. In *Ṛtuchakra*, regular cyclical changes of that archetypal (type1) model suggests that, this regular, cyclical harmonization

may be regarded as periodic preparation for pregnancy and fertilization. Deviation from regularity would mean a defect and what aspects need adjustment - whether psychological, physiological, environmental or spiritual, compared to the constitution of the body and mind (*Deha-Mānasa Prakṛti*) - could be easily identified through these sharp and clear demarcations.

Four phased classification of R̥tu; Swerving Doṣa across the three fixed time phases

As a river is cleansed by its current, women's bodies undergo a physiological cleansing and preparation by the menstrual flow. The cleansed uterus begins the new endometrial proliferation (*Navaraja*), the first phase (*R̥tukāla*), with *Kapha* for embedding the fertilized ovum. Continuation of this phase commences from the 14th day of cessation of menstruation which would have continued for an average of 12 days, as referred in medical biology, i.e. 14 ± 2 . The high anabolic functions in this phase are considered the '*Kaphaparakopa Kāla*' or the *Kapha* dominant phase. This is the preconception period or estriol phase in which the female expecting to become pregnant, can follow the appropriate measures to facilitate pregnancy. She can also expect to have optimal gene constituents of a baby born during the estrogen heavy period (Murthi, 1996). The formation of the ovum stops as the follicular phase turns into the luteal stage to receive the fertilized ovum (Thiyagarajan et al., 2023). The other two *Doṣa* reside in the same environment similar to the seasonal changes in the external environment. The *Pitta Doṣa* passes through the accumulative state and the *Vāta Doṣa* remains passive, also known as '*Doṣa Gati Siddhānta*'.

Ayurveda principles, such as '*Doṣa Gati Siddhānta*' (Caraka Samhita, Sūtrasthāna 15/5, 2008) and '*Loka Puruṣa Sāmya Siddhānta*' (Caraka Samhita, Sharīra Sthāna 4/13, p. 318, 2008), describe a metaphorical mirroring between the body's *Doṣa* and external seasonal changes (Aiyana, 2019). While this conceptual parallel is recognized, Ayurveda does not establish a direct, phase-specific correlation between the menstrual cycle and individual seasons. Building on these traditional insights, this discussion proposes a two-type menstrual cycle pattern, with Type 2 exhibiting characteristics parallel to the four environmental seasons. However, from a contemporary scientific perspective, the precise relationship between seasonal light exposure and female neuroendocrine and ovarian function remains an area of ongoing research (Vidafar & Spitschan, 2023).

The second phase starts with *Pitta Doṣa* becoming prominent while *Kapha* is in its physiological extreme. The body temperature increases as *Pitta Doṣa* readies itself for ovulation. This favorable period for conception extends for 3-4 days. Therefore, this ovulatory phase becomes active with extreme *Kapha Doṣa* and moderate *Pitta Doṣa* with a neutral level of *Vāta*.

This is followed by the '*Ṛtuyatita Kāla*', the third phase, which commences on the 15th day of menstruation. Leaving 3-4 days for the ovulatory phase, commencement of the third phase should technically be considered to be the 17th day of menstruation. If fertilization occurs, the *Pitta Doṣa* helps the fertilized ovum to grow during this period and its expelling action does not become prominent as it allows further proliferation with the help of *Kapha Doṣa*. Where there is no fertilization, *Pitta Doṣa* increases further and when at an extreme level, its '*Uṣṇa Guṇa*' (property of heat) (Kulkarni et al., 2021; Wadoodkhan, 2016; Aishwarya, 2022) liquifies the endometrial layers with the help of properties '*Sara*' (flowing/spreading) and '*Drava*' (liquid/liquefying). Consequently, the endometrium is expelled along with blood. This can also be explained as the lost progesterone hormone assisting the dead endometrium to prepare to be naturally removed. The involvement of other *Doṣa* during the last days of the phase, *Vāta Doṣa* accumulates (the '*Chaya*' stage), preparing to initiate its crucial function at the peak of the menstrual flow period ('*Rajodṛṣṭi Kāla*'). Therefore, in the third phase of menstruation, *Pitta* is active, *Vāta* accumulating or in the '*Chaya*' phase and *Kapha* is in a neutral or pacified state.

The fourth phase – '*Rajodṛṣṭi Kāla* or '*Ṛtu srāvakāla*' – is of 3-5 days' duration where the endometrial wastes are to be removed. Hence, *Vāta* becomes active at this stage, which is known as *Prakopa*, and uses its maximal kinetic energy and ceases the endometrial functions of the *Pitta Doṣa* while leaving it pacified. However, in order to prepare for the next new cycle, *Kapha* has to function as '*Chaya*'. This '*Rajodṛṣṭi Kāla*' or menstruation, occurs without undergoing any abnormal imbalance or aggravation of *Vāta Doṣa*. Manifestation of symptoms indicating pathological vitiation or imbalance takes place because of the food and lifestyle maintained for a considerable period by the female and carries with it clinical significance in the diagnosis and management of female reproductive health conditions.

Evidently, Swerving *Doṣa* fluctuates across the four phases (Fig. 3), manifesting in four distinct situations. The 3-4 day ovulatory phase is accounted for under the third phase of the cycle. Furthermore, this pattern can be compared to the 29.5-day (approximately 28-day) lunar cycle (Collings, n.d.; Aiyana, 2019), the Archetypal (type 2) model, or the Swerve *Doṣa* behavior model (SDB model) which illustrates how *Doṣa* dynamically shift and interact across different phases or cycles. In the SDB model, the full moon corresponds to the ovulatory phase, and the dark moon (new moon) corresponds to the menstruation phase.

The four phases of the *Ṛtu* are as follows:

Vāta dominant (*Kopa*), *Kapha* accumulated (*Chaya*) ***Rajasdṛṣṭhi Kāla***, which continues for 3-5 days;

Kapha dominant (*Kopa*), ***Navaraja Kāla***, which continues for 7-8 days;

Kapha dominant (*Chaya*), *Pitta* moderately high, *Navaraja kāla*, for 3-5 days (the ovulatory phase); and *Pitta* dominant (*Kopa*), *Vāta* accumulated (*Chaya*), and '*Rtuyatita Kāla*' (12-14 days).

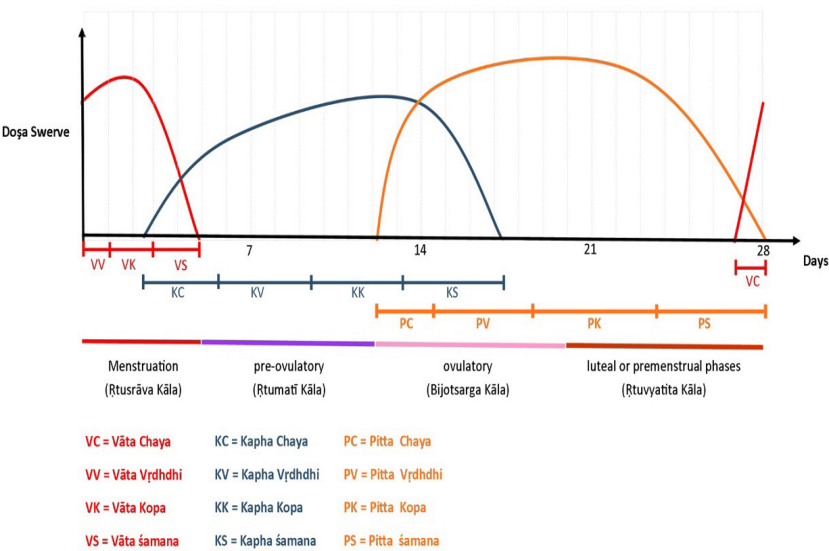


Figure. 3: Swerving Doṣa across the four fixed (functional) time phases
fixed time phases - SDB model & Archetype (type 2)

Authors of the Ayurveda Samhita mention the given duration in number of days of '*Rajokāla*' with slight changes. Both Vagbhata Samhita and Bhavaprakāṣa have numbered it as 3 days, while Caraka and Harita have designated it as 5 and 7 days respectively (Chauhan, 2022; Sharma, Sakshi, & Upadhyay, 2020; Shridevi & Shreevathsa, 2018).

This Swerving *Doṣa* concept closely identifies with three aspects. First, it elucidates the physiological changes of *Doṣa* throughout the three phases of their fixed pattern. This involves a four-phasic adjustment of the body's internal physiological environment, comparable to the external seasonal changes, which in turn contributes to a feeling of improved physiological harmony and adaptation. Secondly, the swerving *Dosa* concept helps to pick the exact date of ovulation. Finally, to calculate time for taking corrective measures for harnessing good seeds of the male partner via efficacious drug delivery, swerving *Dosa* remains helpful.

'Ritumatī': Estrous signs of the ovulatory female

The ovulatory female would exhibit healthy physiological signs that would attract the opposite gender. The ovulation of a female who passes the ovulatory phase

possessing healthy yoni (the entire reproductive system) (Pournima, 2014; Shinde & Pande, 2022) prepares the body by a complex reciprocity of glands and hormones for conception. An ovulating female shows certain behavioral characteristics due to the functions of estrogen in the follicular phase. This peak fertility period manifests in eight different features of the female revealed in *Sushruta Samhita, Sharira Sthāna, Garbhavakranti Shareera Adhyaya*. 3/7-8. The female is named ‘*Ritumatī*’ and would look bright, healthy, possess a tendency to have sexual relations, and be happy and excited during *Rtukāla*. The period is also called ‘*Antahpuṣpa*’ which is essential for conception. Therefore, ovulation is not hidden in humans, but estrous signs are explainable in modern physiology, which helps to harness the feminine energy, intellectually and physically for better interpersonal skills.

‘*Dehaprakṛti*’ (body constitution) is unique to each individual, though the involvement of *Tridoṣa* in it is a universally accepted concept, irrespective of age. ‘*Prakṛiti*’ affects the menstrual flow (Petwal et al., 2022). Similar to the ‘*Ritumatī*’, behavioral characteristics can change due to the *Doṣa* involvement of *Prakṛti*, including the very possibility of being affected by the environment and season. This can be observed in today’s lifestyles where females face menstrual irregularity such as extended periods of menstruation and severe abdominal and pelvic pain associated with other hormonal disturbances. Therefore, imbalanced durations of ovulatory and secretory phases cause barriers to conception. These barriers may lead to the need for medicinal and counselling interventions.

Comprehension of *Doṣa Pradhānātā*, or the influences of the *Tridoṣa* across the three phases of the *Rtuchakra* (the female hormonal cycle), facilitates the tailoring of therapeutic interventions, drawing upon insights from both physiological and *Doṣa* dynamics to include various modalities such as Qi energy balancing therapies. During *Rajahsrāvakāla* (the menstrual phase), women experience lower back, abdominal, and pelvic pain due to the inherent predominance of *Vāta Doṣa*. *Rtukāla* emerges as the most productive phase for ovum generation and uterine tissue development, both physically and mentally, because of its inherent *Kapha Doṣa* predominance. Subsequently, *Rtuyatākāla* shows the predominance of *Pitta Doṣa*. While this phase is vital for potential implantation, an impact of *Pitta Doṣa* results in symptoms like anxiety, malaise, or sleep disturbances (Petwal et al., 2022).

Adolescents today experience the changes in these three phases and suffer mentally and physically due to the lack of awareness for adjusting their lifestyles according to the three phases of ‘*Rtu*’, their body type, and seasonal and geographical factors. If irregularities persist throughout adolescence without identifying a specific pathology, the female reproductive system may suffer from many diseases. These potential health impacts highlight the importance of understanding factors that influence reproductive health, including the role of the external environment, which is explored in the following section on *Rtu* and FOAD.

‘Rtu’ and FOAD

‘*Rtu*’, in the sense of the external environment, brings awareness of the effects of hazardous stimuli to the bodily environment of both genders. The *Rtukāla* of the female, when *Rtu* is considered as the broader living environment for an individual, encompassing not only seasonal changes but also daily rhythms, geographical context (*Deśa*), and individual constitution (*Prakṛti*), has a considerable impact on the fetal origin of adult diseases (FOAD) (Sabharwal et al., 2022). The concept of FOAD is explained in utero programming as ‘*Rtu Parināma*’ or the adaptation of the body to a spectrum of adverse environmental conditions that ultimately leads to increased susceptibility to age-related diseases, such as Type 2 diabetes and cardiovascular diseases. This reveals that the *Rtu*, as the external environment has a considerable effect on FOAD. The interaction of the external and the bodily environments has the ability to compromise future progeny. Thus, hazardous external environmental stimuli of two weeks duration of ‘*Rtu sankrānti*’ or ‘*Rtu sandhi*’ (Dandge et al., 2017) (Tiwari, 2019) similar to the transitional time of day and night (dawn and dusk) and the challenges posed, have been discussed in recommended health practices described mentioned in Ayurveda texts. This science contains advice for special mental and physical care to minimize external sensory stimuli. Therefore, the gradual overcoming of unwholesome practices in preparation of menstruation is advised in the seventh chapter of the Caraka Sūtra (36-37).

Clinical Importance of ‘Rtukāla’ and ‘Rtuchakra’

It is important to embrace parenthood by intention, not merely by fate. This places the responsibility not solely on the female partner, but on the entire family, including its adult members. Striving for healthier offspring involves adhering to mindful daily routines and lifestyle practices, guided by the wisdom of experienced family members or knowledgeable caregivers. The planning stage of conception should ideally commence before marriage, with the marriage itself being a well-considered decision based on psycho-physiological compatibility. A marriage contributes significantly to a family and society, particularly through the offspring it produces. The health and well-being of individuals, families, and even future generations hinge upon the choices made during this crucial planning stage. Based on this study, the process of planning for progeny can be divided into three distinct counseling phases. These phases are: the selection of partners and pre-counselling for marriage (Pre-marriage counseling); preconceptual counselling; and post cohabitational counselling for fixing the conceptus. (Caraka Samhita, 2000; Sushruta Samhita, 2005).

Among these three counseling stages, the first and second are crucial for ensuring the health of the offspring. Pre-marriage counseling and medical interventions, along with education about the *Rtuchakra* (menstrual cycle), can

help address issues and empower individuals to make informed choices about their reproductive health. This can be achieved by promoting the production of a healthy ovum and accurately identifying the ovulation window. These fertile days are typically indicated by the woman's estrus signs, known as '*Ritumati*.' However, if these physiological signs are absent or abnormal, awareness of the menstrual cycle and date counting becomes essential for optimizing conditions for conception.

Awareness of the menstrual cycle can be leveraged for targeted and effective drug delivery in women's health, particularly for cycle-related conditions and hormonal therapies. Since drugs become more efficacious after undergoing several metabolic processes, administering them within a specific two '*Yāma*' (6-hour) window can lead to faster drug action during the short ovulatory phase, leading to successful conception of offspring (Divyarani, 2023; Murthi, 1996; Pawar, 2019). To address underlying pathologies, it is necessary to track menstrual cycles, ovulation and proliferative dates for several months until the condition is resolved.

Consciously tracking menstrual cycles, particularly the odd-numbered days, can significantly increase chances of successful conception and may even influence the gender of the offspring (Sharma, 2000). However, menstrual irregularities, such as prolonged or shortened cycles, intermittent bleeding, or absent periods, can obscure the identification of key fertile phases (Anagha & Deole, 2020; Sharma, 2000). These irregularities can stem from various factors, including lifestyle choices, dietary habits, and stress-related pathological influences (Negi et al., 2018). Pre-marriage counseling and medical interventions, along with education about the *Rtuchakra* (menstrual cycle), can help address these issues and empower individuals to make informed choices about their reproductive health.

When addressing subfertility concerns, predicting ovulation is crucial for advising couples on optimal timing for intercourse, especially in cases of oligospermia (Shende, Shilimkar, & Birla, 2021). By following a healthy regimen-based lifestyle and consuming specific foods that are digested and metabolized within 12 hours (four '*Yama*'), the female partner can potentially increase the chances of conception, even with a lower sperm count. Additionally, the male partner can enhance sperm quality and quantity by using medications that act within six hours (two '*Yama*') during the woman's ovulation window. Understanding the timing of ovulation in the proliferative phase and the pharmacological action of food and drugs can significantly improve the likelihood of conception, even when the male partner has oligospermia (Sharma, 2000).

Pre-education and counseling about the three-phase menstrual cycle can help prevent unplanned pregnancies, promote healthier pregnancies, and potentially allow for gender selection among young women. Young females should be well-informed about managing the menstrual flow and its associated discomforts, both physically and psychologically, and should be encouraged to prepare in advance for their menstrual periods.

Maintaining good health during menstruation involves personal hygiene, dietary adjustments, and managing psychological well-being. Unhealthy food and lifestyle choices can disrupt menstrual phases, impacting ovulation and make it difficult to track the cycle. By understanding the basic phases of menstruation and effectively managing them through dietary and lifestyle modifications, couples can increase their chances of conceiving healthy offspring. Pre-marriage counseling and medical interventions can further assist in identifying and addressing any imbalances and promote overall reproductive well-being.

Conclusion and scope for future research

Rtu and *Rtuchakra* significantly impact the prospects of having healthier offspring and promoting overall well-being in women. Through proper awareness, mindful adjustments, and synchronization with the environment, *Rtuchakra* fosters personal and social well-being, leading to healthier progeny. *Rtu*, or the environment and seasons, plays a mutually beneficial role in maintaining health within the human body's ecology, impacting both men and women and, consequently, their offspring.

The impact of *Rtu* and *Rtuchakra* on achieving healthier progeny is comprehensively analyzed through ten interconnected aspects of female reproductive and holistic well-being, encompassing physiological factors (e.g., age, oocyte quality), *Doṣa* dynamics, and complex psychosocial, spiritual, and ritualistic dimensions of the menstrual cycle interconnected aspects of female reproductive and holistic well-being. This analysis encompasses their influence on fertility, the identification of suitable time slots for conception, and an understanding of *Doṣa* behavior, as highlighted through the concept of '*Rtumatī*.' The review of the FOAD theory introduces additional considerations regarding the connection between '*Rtu*' and healthier progeny, particularly in relation to '*Rtu Parināma*,' '*Rtu Sandhi*,' and the transitions of morning and evening.

Pre-marriage counseling includes partner selection and education; preconceptual counseling focuses on promoting healthy ovum production, identifying the ovulation window, and effective drug delivery; and post-cohabitational counseling focuses on preventing unplanned pregnancies and promoting healthier pregnancies. The menstrual cycle, or *Rtuchakra*, serves as a monthly cleansing process, removing *Upadhātu* from *Rasadhātu* to restore the body's vital energy (*Ojas*) to optimal levels. Consequently, women generally experience good health from menarche to menopause.

Fundamentally, *Rtuchakra* identifies three basic patterns of cycles, beginning with the *Āgneya* (hot) and *Saumya* (cold) phases. When these phases are balanced, they manifest through the estrus sign ('*Ritumatī* '), providing a visual indicator of ovulation and the fertile window during peak reproductive years. These two phases fall within the *Antahpushpa* or *Rajovyatita Kāla*, the non-menstrual period of a healthy female.

Secondly, the fixed pattern *Doṣa* behavior (*Niyathi Kāla Siddhāntha*) leads to an observable pattern of *Thridoṣa*, represented by the FOBT model or archetype type 1. This three-phase cycle allows even laypersons to identify their *Doṣa* imbalances and seek appropriate counseling for necessary adjustments. Thirdly, *Doṣa* behavior archetype type 2 facilitates conscious adjustments to one's inner ecology across four phases, mirroring the seasonal changes in the external environment. With knowledge of this *Doṣa* behavior (the SDB model), counselors and educators can empower individuals to experience greater ease, pleasure, coherence, and effectiveness in utilizing their energy during each phase. Additionally, it enables precise ovulation timing calculations, facilitates corrective measures and the selection of optimal 'seeds' for conception through targeted drug delivery.

The scientifically validated concept of FOAD, which is explained in utero programming, aligns with the Ayurveda understanding of diseases caused by '*Rtu Parināma*' (the transitional time of seasons) and the transitions of dawn and dusk. *Rtu*, in the context of the external environment, can significantly impact all living beings, regardless of gender, through adverse environmental stimuli. Women's natural ecological rhythm, synchronized with seasonal changes, creates archetypal cycles that protect not only their well-being but also that of future generations. The concepts of '*Rtu Sankrānti*' and FOAD mutually reinforce each other, emphasizing the importance of harmonizing with seasonal cycles and the *Rtuchakra*. Vigilant adjustments to lifestyle and habits in accordance with *Rtu* are key for both men and women to ensure good health for themselves and their progeny. For women, *Rtuchakra* serves as a valuable tool for understanding and achieving overall well-being for themselves and their offspring. These connections underscore the value of revisiting original classical, natural-derived Ayurveda teachings to uncover further practical approaches to achieving female reproductive health and overall well-being. This study aims to inspire further research, both broadly and within the specific areas explored in this review, such as menstruation, female fertility, and the psycho-social and environmental influences on reproductive health.

Conflict of interest

The author declares no conflict of interest.

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