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{Review Article}

RELEVANCE OF *RUTUMATICHARYA* IN CONTEXT OF MODERN GENETICS

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Abstract: The concept of *Ayurveda* genetics theory is beautifully described in various chapters of *Sharirsthan* of *Sushruta Samhita.* Almost all topics about genesis are explained in Ayurveda compendia, the need is to comprehend this knowledge based on present theory of genetics. Ayurveda recommends some instruction to *Rutumati* (Menstruating women) which is known as *Rutumaticharya*. The strict regimen given to menstruating women by ancient compendia must have some relevance in the vital process of reproduction. The researches in epigenetics had proved role of dietary and other lifestyle behavior on the progeny. While studying literature related to *Garbhasharir* especially through *Sushruta Sharirsthan* it was noticed that there should be some correlation between *Rutumaticharya* and health of progeny. **Aim-** To assess the relevance of *Rutumaticharya* in the context of modern genetics for genesis was the prime aim to initiate this study. **Material & Methodology** -Thorough review of literature related to *Rutumaticharya* was done through Ayurved compendia and other supportive literature from various sources like journals and internet. **Result-** During first three days of menstruation women should kept celibacy. In pachytene and diplotene stages of prophase the exchange of genetic material between central chromatids of a chromosome pair takes place and unwanted chromosomes are get rid through the formation of First polar body. **Discussion-** There may be any relation between maturation of oocyte and *Rutumaticharya*. **Conclusion-** Understanding the regulation of and progression through meiotic prophase one in oocytes and with respect to *Rutumaticharya* will provide a more comprehensive picture of meiosis and aid in developing better female infertility treatments.

Keywords: Menstruation, *Rutumaticharya, Cell Division,* Genetics

Introduction-The term *Ritu* is derived from the root word *'Ru,"* which means to go. *Ritu* represents the form in which nature expressed itself in a sequence in specific conditions of two months duration (Amarakosha). In Ayurveda, the season is represented by the term *Kala. Kala* is a broad term. In one context it is mentioned as seasons, while in some other context, it merely represents time. The term *Ritu* is the most suitable term to explain seasons. The term *Ritu* refers to a specific period having a cyclic rotation. In the context of *Ritucharya, Ritu* is mentioned as the term in which nature expresses itself in sequence, in specific forms of a two-month duration *(Dvau Masau).* [A. Hr. Sutra Sthana 3/1 Hemadri]. *Charya* means regimen or action. Dalhana defines *Rutumaticharya* as the regimen that should be followed concerning seasons. [Su. Sa. Sutra Sthana 6/1 Dalhana]. Vagbhata defines it as the changes in diet and

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practices with respect to changes in climate conditions like heat, cold, rain etc. [A. Sa. Sutra Sthana 3/1 Hemadri]

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Material & Methodology -Thorough review of literature related to *Rutumaticharya* was done through Ayurved compendia and other supportive literature from various sources like journals and internet.

Concept of *Rutumaticharya* -*Charya* or *Paricharya* means certain measures to be followed regarding food habits and lifestyle for healthy life. In Ayurveda, acharyas mention different *Charyas* for maintaining the health like *Garbhini Charya*, *Soothika Charya*, *Rutumaticharya* etc. The *Charyas* or code of conduct mentioned for a *Rutumati Stree* is termed as *Rutumati Paricharya* and is the most neglected part in the society. Acharya has mentioned that, following this *Rutumaticharya* from the moment of appearance of menstrual flow, for a period of three days. The Charya should include both mental and physical rest. During the period female should maintain good thought and follow the rituals with a pleasant mind. The *Rutumaticharya* helps women to cope up with her physiological changes taking place in the body during the *Rutumati* period. It will help women to become healthy both physically and mentally during the menstrual cycle. [1]

The *Rutumaticharya* as an important tool to enhance fertility and is told in Ayurvedic classic decades before. The menstruating woman must follow the *Charya* during the menstruation for the first 3 days and in the 4th day the female should take bath and wear white garments with flowers and ornaments and worship god. Then she should indulge in sexual intercourse for achieving a good progeny. If the woman does not follow the *Charyas* properly, then the dosha vitiation occurs and it further affects the fetus. The abnormalities occur to the fetus are following.[2]

Table 1: Contraindicated actions of the mother cause abnormalities in the child.

Sr.No.	Action of mother	Abnormalities of Fetus
1.	*Divaswapna* (Day sleeping)	*Swapasheela* (Over sleeping)
2.	Use of *Anjana* (Collyrium)	*Dagdha* (Partial Blindness)
3.	*Rodhana* (Weeping)	*Vikrita Drishti* (Defective vision)
4.	*Snanam* (Bathing)	*Dukha Sheela* (Sadish)
5.	*Abhyanga* (Oil Massage)	*Kushta* (Skin Disorders)
6.	*Nakhapakarata* (Paring of the nail)	*Kunakhi* (Deformity of the nail)
7.	*Pradhavana* (Fast running)	Unsteady both mentally & physically
8.	*Hasana* (Laughing)	The black colour of lip and thumb
9.	*Pralapa* (Over talking)	Talkative
10.	*Atishabdha Sravana* (Over hearing)	Deafness
11.	Combing the hair	Baldness
12.	Exposure to the breeze and too much exertion	Mentally trouble
13.	Use of *Nasya*	Menstrual abnormalities

If the copulation occurs the first day of menstruation, it affects the health, lusture

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and vision of the husband. During the time, the entry of sperm into the canal is not possible and does not result in pregnancy. So acharyas indicated brahmacharya at the time of menstruation otherwise it will worsen the condition of the well-being of the women. Even though it is difficult to get pregnant during the time of menstruation, Acharya Kashyapa describes the effect on the child if pregnancy occurs.[3]

Table 2: Effect on the baby when the pregnancy occurs in menstruation.

Sr.No.	Menstruation	effect on fetus
1.	First Day	No pregnancy/intrauterine death
2.	Second Day	Abortion/ Stillbirth
3.	Third Day	Defective body part and short life
4.	Fourt Day	Normal and healthy life

Menstruation- Menstruation is a natural unique phenomenon in women's lives and the female is called as *Rajaswala* during that period. It is the mirror of reproductive health. The time from the menarche to the menopause is called the menstrual period. The definition of *Stree "Styayati Yasmat Garbha Iti Stree"* Acharyas mention the quotations like *'Swarthabudhi Paratheshu' and 'Streetuloke Pratishtita'* which shows the importance of *Stree* in Ayurveda. Women pass through three stages in life – *Bala* (childhood), *Rajaswala* (Menstrual period), and *Vridha* (Old age). Among them, *Rajaswala* period is the largest and the most important period. It belongs to the middle stage of life as it is *Pitta* predominant time and the hormone regulating period. Acharya Charaka said that the woman is the origin of progeny and considered as the best *Vajikarana Dravya*. The reproductive stage of the woman and her health determine the health of the progeny. The female who is menstruating is termed as '*Rajaswala*'. The *Nirukti* is *'Raja Asti Asya Iti'* means she who possesses the *Rajas.* It is divided into *Tarunee* (Puberty and adolescence – 16-32 yrs) and *Adhirudha* (Climacteric – 33-50 yrs). The synonyms of *Rajaswala* are *Atreyee, Malini, Pushpavati, Ritumati etc*. [4]

Cell Division-

The body is made up of trillions of somatic cells with the capacity to divide into identical daughter cells facilitating organismal growth, repair, and response to the changing environment.[5] This process is called "mitosis." In the gametes, a different form of cell division occurs called "meiosis." [6] The outcome of meiosis is the creation of daughter cells, either sperm or egg cells, through reduction division which results in a haploid complement of chromosomes so that on joining with another sex cell at fertilization a new diploid chromosomal complement is restored in the fertilized egg. [7]

Genomic diversity and genetic variation is produced through the process of meiosis due to chromosomal recombination and independent assortment.[8] Each daughter cell created is genetically half-identical to that of its parent cell yet distinctly different from its parent cell and other daughter cells.[9]

In female mammals, meiotic prophase one begins during fetal development. Oocytes transition through the prophase one substages consisting of leptotene, zygotene, and pachytene, and are finally arrested at the diplotene substage, for months in mice and years in humans. After puberty, luteinizing hormone induces ovulation and meiotic resumption in a cohort of oocytes, driving the progression from meiotic prophase one to metaphase two. If fertilization occurs, the oocyte completes meiosis

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two followed by fusion with the sperm nucleus and preparation for zygotic divisions; otherwise, it is passed into the uterus and degenerates. [10]
As meiotic prophase one proceeds, chromosomes find their homologous partner, synapse, exchange genetic material between homologs and then begin to separate, remaining connected at recombination sites. At postnatal day 5, most of the oocytes have reached the late diplotene (or dictyate) substage of prophase one where they remain arrested until ovulation. While meiosis evolved from mitosis, novel steps were acquired that include pairing and recombination between homologous chromosomes, the inhibition of sister-chromatid separation during meiosis one (MI), and the absence of DNA replication during MII (Wilkins and Holliday, 2009). Following premeiotic DNA replication, germ cells enter an extended MI prophase which is further divided into four substages called leptotene, zygotene, pachytene, and diplotene based on cytology (Borum, 1961). During the leptotene stage, the earliest stage, chromosomes have not yet condensed and appear relatively long. In the zygotene stage, homologs begin to pair by a process called synapsis and start to condense.

The pachytene stage is the third and longest stage of prophase one. By the start of the pachytene stage, the paired homologous chromosomes have become fully synapsed and by the end of this stage, chromosomes appear shortest and highly condensed. Toward the end of prophase one, homologs separate from each other marking entry into the diplotene stage. Homologous chromosomes remain physically connected at chiasmata which represent regions where crossing over has occurred during recombination which is the exchange of genetic material (Bolcun-Filas and Schimenti, 2012). It is thought that oocytes arrest in the diplotene substage because this is the most stable conformation of chromosomes as oocytes may remain at this stage until ovulation occurring months later in mice and years later in humans (Hartshorne et al., 2009).

The significance of prophase one events for ensuring accurate chromosome segregation is underlined by the observation that most aneuploidies result from chromosome non-disjunction during the first meiotic division (Morelli and Cohen, 2005). This review describes recent findings on meiotic prophase one progression in mammalian oocytes up to the dictyate stage, with some reference to analogous events in mouse spermatocytes and yeast. By understanding what is known in the mouse model, we may gain insights into causes of high aneuploidy rates in human females. During meiotic prophase. one, DNA is intentionally “damaged” so that recombination can occur. Mechanisms are in place to repair this damage but if the DNA is not repaired a DNA damage response is triggered leading to the elimination of defective oocytes (for review see Gebel et al., 2020).

Genetics- The Ayurvedic scholar had a fundamental knowledge of genetics much before the modern genetic scientist. Though Ayurveda does not implicate the pure and literally aspect of genetics in much details but has taken up its applied aspect scientifically under the following heads i.e. the theory of evolution, the role of *Panchamahabhuta* in the formation of different organs in human body, manifestation of different genetically determined congenital disorders. The genetic factors which are responsible for procreation of human being, concept of *Beeja* (germ cells), *Beejabhag* (chromosome) and *Beejabhagaavayava* (gene), *Upotapta*, (mutation) determination of sex, concept of eugenic principle etc. The Ayurvedic scholar has emphasized specific daily routine of the mother during menstrual, period, before coitus to give birth of a desirable quality of child. All the factors are derived under the heading of eugenic

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principle stated by different Ayurvedic classics two types of eugenic principle categorically described in Ayurvedic compendium one is the positive Eugenic principles are. *Pumsavan Prakriya,* Regimen from pregnant woman, regimen for achieving excellent progeny and measure before cohabitation. Negative Eugenic principles are. Consanguineous marriage and. age of conception etc.

Result- These *Rutumati lakshana's* are getting proved by latest research and there is a striking similarity found between *Rutumati lakshana's* and functions of estrogen hormone/human estrus/follicular phase/peak fertility period in women. Women have been thought to possess no distinctive sexuality during the fertile phase of their menstrual cycle. Abundant evidence now indicates that they do. Ancient Ayurvedic sages were able to detect ovulation in females by observing the various physiological and behavioral cues which occur during peak fertility.

Discussion- In Ayurveda, *Rutumati Charya* refers to the recommended regimen for women during their menstrual cycle, particularly during the fertile or ovulation phase (Rutu Kala). It emphasizes self-care practices to support both physical and mental well-being during this time. While Ayurveda does not directly correlate "prophase stages" with *Rutumati Charya,* it does highlight the importance of understanding the physiological changes during the menstrual cycle, including the maturation of the ovum, which is in prophase I of meiosis during ovulation.

Conclusion - Meiotic prophase one is imperative to ensure accurate chromosome segregation as well as reproductive success. Understanding the regulation of and progression through meiotic prophase one in oocytes and with respect to *Rutumaticharya* will provide a more comprehensive picture of meiosis and aid in developing better female infertility treatments.

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