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"A conceptual and Practical Framework of Ayurveda with Special Reference to Rasashastra"

Dr. Ramakant Vyas[1], Dr. Abhishek Sharma[2], Dr. Poonam Kumari[3], Dr. Abhay Vyas[4]

1. Associate Professor, Dept. of Rasashastra & Bhaishajya Kalpana, Guru Nanak Ayurvedic Medical College & Hospital, Sri Muktsar sahib. Email- ramakant12385@gmail.com.
2. Assistant Professor, Dept. of Rasashastra & Bhaishajya Kalpana, Vaidya Yagya Dutt Sharma Ayurved Mahavidyalaya, Khurja (UP). Email- abhisharma3304@gmail.com.
3. Associate Professor, Dept. of Agad Tantra, Guru Nanak Ayurvedic Medical College & Hospital, Sri Muktsar sahib. Email- drpoonam010@gmail.com
4. Assistant Professor, Dept. of Dravyaguna Vigyan, Shubhdeep Ayurved Medical College & Hospital, Indore, Email- avabvyas@gmail.com

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Abstract-

Rasashastra is one of the specialist branches of Ayurveda that is considered the study of mercury. Ayurveda specified several branches for the management of normal health condition. This branch is important for both therapeutic and preventative purposes. It adheres to several tenets and customs, including Sodhana, Marana, and Jarana. This branch was first known as "Rasashastra" since it primarily dealt with Rasa (mercury) and Rasa Dravyas throughout the creation era. The idea of Rasashastra has several benefits for preserving a healthy physical and mental state. Rasashastra holds a special place among the many Ayurvedic therapeutic modalities since the medications employed in it may cure a wide range of illnesses. Taking into account all of these factors, the current paper examined the general ideas, methods, and significance of Rasashastra. The objective is to debate the subject with cross-disciplinary knowledge and to have a conversation about study activities while addressing the topic in a clear and organized manner so that regular people may understand it better.

Keywords-Ayurveda, Rasashastra, Rasayana, Principal & Practice.

Introduction- Ayurveda is regarded as an Atharvedic upaveda. 'Science of life' and 'science beyond life' are two terms that describe it. The philosophical theories of Sankhya and Vaiseshika form the foundation of Ayurveda. Ayurveda adheres to specific metaphysics and epistemologies. "The Sushruta Samhita refers to and adopts the Prakrti-Purusha concept."[1]. Motivated by Sankhyas, Sushruta asserts that there are sixteen "Vikaras" and eight "Prakritis." The Tridosha theory of Ayurveda, including the atomic theory and the five gross elements (Pancha Mahabhuta) theory, is derived from the ontology of Vaiseshikas. According to Charaka, the main goal of Ayurveda is to preserve the health of the well and provide appropriate care for the ill in order to achieve the ultimate goal of "moksha." The whole body of Ayurvedic knowledge has been divided into eight divisions to support different therapeutic

approaches.[2] They are -Kayachikitsa (Medicine), Kaumarbhritya (Pediatrics), Shalya tantra (Surgery), Shalakya (E.N.T.), Bhootvidya (Psychotherapy), Agadtantra (Toxicology), Rasayan (Rejuvenation therapy) and Vajikarana (Aphrodisiacs).

Even though Rasa Shastra is not one of the afore mentioned, it and Dravya guna together constitute Ayurvedic medicine. Of the eight therapy limbs, the Rasayana method is distinct since it offers a speedy cure for illnesses and is comparable to ideas in modern medicine that are referred to as "Allopathy."

Caraka states about *Rasayana* as **"स्वस्थस्योर्स्कं यत्तु तद् वृष्यं तद्रसायनम्।"**[3]

Rasayana is what gives a healthy person immunity and virility and gives back to a sick person. Rasa Shastra in may have developed after the Samhita time as a result of the idea of Rasayana therapy in Samhita age. Ayurvedic universities have created distinct departments for the other forms of Ayurvedic therapy, which are essentially "specializations." Rasa Shastra uses herbal and metallic medicines to cure both mental and physical ailments.[4] Using a range of minerals, Ayurveda had a significant influence in the advancement of chemistry in ancient India. In ancient India, chemistry was referred to as Rasatantra, Rasa Kriya, Rasa Vidya, or Rasayan Shastra, which approximately translates to "Science of Liquids." All of the main areas of human knowledge and endeavors, such as mathematics, astronomy, physics, chemistry, medical science, and surgery, were covered by science and technology in ancient and medieval India.[5]

Aims & objective:

1. To clearly define a conceptual model that connects operational research components to traditional Ayurvedic concepts.
2. To outline workable, sequential procedures (SOPs) for Rasashastra preparations that prioritize repeatability and safety.
3. To suggest interdisciplinary research approaches for assessing Rasashastra formulations both preclinically and clinically.
4. To pinpoint important ethical, legal, and quality control concerns and offer fixes for responsible translation.

Rasa Shastra- Rasa is a reference to the element mercury. The term "rasa shastra" literally translates to "the science of mercury" and mainly refers to the study of assimilating minerals for use as medications. Rasa can mean "taste" (Rasyate aaswadate itat rasah) or "juice" (Rastat shareere prasartat itat rasa), among other things.[6]

The words "water," "pleasure," "emotions," "mercury," and "poison," among others, have been used to describe the meaning of the term "Rasa." Alchemy and Rasayana are the two primary branches of Rasa Shastra. Alchemy's primary objective is to transform inferior metals into higher ones, whereas Rasayana is seek to revitalize the body and mind. Poisons, metals, minerals, diamonds, and gemstones are all properly categorized in Rasa Shastra books, which also explain how to purify and process them (samskaras) to produce and improve their medicinal qualities while reducing their toxicity to the body.[7]

"There is no better medicine than mercury, no greater god than Madhava, no better friend than a

physician, and no better deed than a gift," goes a well-known saying.

Why is Rasa Shastra relevant?

It is thought that Rasa Shastra originated in the sixth or seventh century A.D. The famous Buddhist scholar Nargarjuna is credited with helping spread Rasavidya and is regarded as the first person to employ mercury. In essence, Rasa Shastra explained two principles:

1. Lohavedha (metal transformation)
2. Dehavedha (body tissue transformation). Mercury science is to be seen as more than just a field of chemistry; it is also to be used for redemption through Dehavedha.[8]".

Naturally, the metal and mineral components present in the earth are comparable to the human body, which is a Parthiva material. Metals are found in tiny amounts in the human body and are necessary for organ function. Malnutrition of the specific tissue or organ results from an electrolyte imbalance or a metal-Ion deficiency brought on by poor diet and age. Therefore, testing for electrolyte and metal deficiencies may aid in their replacement by oral or injectable means. The body will get stronger after equilibrium has been restored. It will no longer be impossible to pursue salvation with a healthy body.[9]

The following are the several kinds of Rasa Dravyas that are employed in Rasa Shastra:[10]

Maha Rasa: mica and iron pyrite, etc.
Uparasa: orpiment, etc.
Sadharana Rasa: arsenic and lead oxide, etc.
Dhatu: iron and copper, etc.
Ratna: diamond and sapphires, etc.
Uparatna: sunstone and tourmaline, etc.
Visha: Sarpa visha and Vatsanabha, etc.
Upavisha: Dattura and Kuchala, etc.

Properties of *Rasa Dravyas*

Metals such as gold are found in the Rasa Dravyas and are typically associated with Swarna qualities such as Madhura and Kasaya Rasa, Snigdha and Laghu Guna, Sita Virya, and Madhura Vipak. For Rasayana, Brimhana, Varnya, Vishanga, Rucikara, Medhya, Dipana, and Vrisya activities, the metal-containing formulations are available. The silver-containing Rasa medications include Madhura Vipak, Snigdha Guna, Sita Virya, and Kasaya & Amla Rasa.[11] These formulations have the actions of Vayasthapana, Vrisya, Lekhana, Balya, Vatapitta Hara, and Ruchya. Formulations that contain mercury as Rasa have the qualities of Vrisya, Balya, Rasayana, Snigdha, and Krimighna.

Rasa Dravyas according to the formulation:

Based on their formulation techniques, the Rasa formulations Kupipakva Rasa, Parpati Rasa, and Khalvi Rasa can be distinguished from one another. When mercury and sulfur or other substances are combined to make a powdered medication, the mixture is known as Kajjali. Mercury and sulfur are crushed into a uniform black powder. After going through a certain process, the powdered Kajjali became liquid and could be applied to the surface of a banana leaf that had another leaf covering it.

Parpati is the name given to the thin, flat layer of material that is visible after banana leaves are removed.[12]

Tools used in Rasa Shastra:

Rasa Shastra addressed toxic, mineral, and metallic medications. These medications underwent pharmaceutical processing to make them suitable for internal administration. Rasa Kriya involves a number of procedures that call for certain instrument types and configurations.[13]

- Baluka Yantra – Heating unit of sand
- Dola Yantra - Indirect heating arrangement
- Tiryak Patana Yantra - Downward displacement apparatus
- Putta - basic type of furnace
- Musha - crucible [14,15,16]

Ayurvedic medicine's Rasashastra uses minerals, pearls, metals, etc. for therapeutic purposes. Shodhana is a form of Samskara, one of several Parada procedures known as Samskaras in Ayurvedic pharmaceutics. That is the exact meaning of the term "Shodhana." The metal or mineral overcomes its initial negative qualities and gains a new, therapeutically beneficial quality throughout the Shodhana process. Among the most popular methods of Shodhana are Galana, Avapa, Prakshalana, Mardana, and Svedana.[17]

The other formulation based procedures of Rasashastra are as follows:

Nirvapa: Super hot metals, plunged in fluids.

Bhavana: Maceration

Bharjana: Searing in container

Between Shodhana and Marana, metals such as Vanga, Yashada, and Naga need undergo a procedure known as Jarana. At temperatures between 400 and 6000 degrees Celsius, the metal is repeatedly triturated in Jarana with either metals or minerals like Parada and Hartala, or with vegetables like Palash Pushpa, Pipala twak, and Apamarga Panchanga, until it turns into a fine powder.[18]

Importance of Rasa Shastra:

Three different kinds of medications are utilized in Ayurveda: khanija, pranija, and kstousadhi. All metals and minerals, including copper, mercury, and others, are included under its initial categorization. All animal goods, including meat, blood, poison, and so on, are described under its second classification. All herbal plants are included in the final category. Mercury, or "parada," falls within the Khanija category. Mercury has an extremely high viscosity and is unstable, much like the human mind. The unstable 'Parada' requires sixteen 'Samskaras'.

Rasa Shastra's use of technology:

Rasa Samskaras, Rasa Siddhis, and building practical labs for experiments are all described in Rasa Shastra. The many kinds of Yantras that are most helpful in the purification of mercury and other metals have been described. Since metals may be extremely poisonous, they should never be utilized without samskaras. It's interesting to note that Rasa Shastra recommends invocatory puja and devotion

while experimenting with each medicinal solution. From some of the preparations under Rasa Vidya, Bhasmas are one type. The following are some of the often-utilized bhasmas: Swarna, Rajata, Tamra, Parada, and Abhraka. Our understanding of nanotechnology in the past is demonstrated by the acquisition of five particles of these treated metals. [19]

An auspicious period, day constellation, etc., is also stated while making or giving the medication. It is undeniable that Jyotisha and Ayurveda are very complementary to one another, and that Ayurvedic doctors were knowledgeable about Jyotisha as well.[20] Regretfully, these topics are taught separately these days. In addition to several unpublished manuscripts in Indian and foreign institutions, there are around three hundred titles of "Rasa Shastra" texts in ancient literature.

Restrictions

- Although it lacks fresh experimental data, this framework synthesizes modern scientific methods with traditional principles.
- Jurisdiction-specific regulatory procedures and analytical criteria differ; local adaptation is required.
- Until solid preclinical and clinical proof is produced, certain traditional statements remain conjectural.

Research Agenda and Suggestions

1. Standardized monographs: Create authoritative monographs outlining raw material requirements, shodhana/marana SOPs, and analytical release testing for widely used Rasashastra components.

2. Analytical technique validation: Make an investment in cross-laboratory validation of particle characterization and speciation analytical methods.

3. Safety databases: For long-term monitoring, set up registries that record exposure, blood/urine metal levels, and clinical outcomes.

4. Studies that focus on mechanisms first: Before doing extensive clinical trials, start with translational in vitro research focusing on tenable pathways (such as immunomodulation or antioxidants).

5. Adaptive designs for clinical trials: To adhere to evidence standards and follow Ayurvedic logic, use stratification by prakṛti and mixed outcome measures.

6. Stakeholder engagement: Early on, involve patient organizations, regulators, and conventional practitioners in the co-design of morally sound and workable research initiatives.

Discussion-

The classical literature of the Ayurvedic medical system describes a variety of formulations that use methods that are somewhat similar to those employed in contemporary medicine to formulate different dose forms in order to achieve the intended effect for the best possible duration. All of the main areas of human knowledge and endeavor were covered by science and technology in ancient and medieval India. Rasa, Dhaatu, Ratna, and Visha are generally regarded as drug categories that fall within the purview of Rasa Shastra. In this context, "Rasa" refers to a liquid with an adaptogenic effect, "Dhaatus"

to an entity that gives strength, "Ratna" to precious materials that possess gem-like qualities, and "Vishha" to toxic elements. The Parada, a liquid metal, is the primary ingredient of Rasa Shastra and is thought to tenfold boost the potency of medications. The marriage of Lord Shiva as mercury and Parvati as sulfur is the name given to the wonderful combination of Parada and sulfur. According to the statement, any metal or mineral should undergo Shodhana purification before being transformed into final formulations. The operations engaged in Rasa shastra such as; purification, sublimation, heating, incineration, grinding, mixing and churning, etc. improves medicinal and pharmacological characteristics of minerals and metals.

Conclusion-

One of the key subfields of Ayurveda, Rasashastra, provides a number of guidelines for maintaining optimal health. Rasashastra primarily explained the many medicinal uses of minerals, metals, Rasayana medicines, etc. This misconception may be debunked by raising awareness of the usage of Rasa Oushadh in significant medical illnesses, such as systemic disorders and carcinomas. Furthermore, it appears that the incidence of adverse effects is nearly zero if the medication is used under close monitoring. The purification processes increase the therapeutic usefulness of metals while decreasing their toxicity. Proficiency in Sanskrit would facilitate the interpretation of original Rasa Shastra writings by Ayurvedic practitioners, opening the door to an interdisciplinary approach. It is imperative that Sanskrit scholars and Ayurvedic scholars work together to re-validate the Ayurvedic theories and notions found in the Samhitas.

Within Ayurveda, Rasashastra holds a special position that is both historically potent and problematic from a scientific standpoint. Rasashastra's therapeutic promise may be maintained while guaranteeing safety, repeatability, and evidence-based integration into contemporary healthcare through a rigorous conceptual and practical framework. We may create a responsible translational pathway for these old technologies by operationalizing classical procedures into quantifiable SOPs and combining them with modern preclinical and clinical research approaches.

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