

# LITERARY REVIEW

## RASĀYANA

Every human beings wishes to attain long & healthy life without any ailments and to have shatayusha i.e. to live for more than hundred years. Vedas have dealt with the problems of aging and its delaying. “Jivema Sharadah Shatam” (Rigveda 10/39/8)

Āyurveda is divided into eight branches, which are collectively called as Aṣṭāṅga Āyurveda. Rasāyana Cikitsā (Rejuvenation therapy) is the branch of Ayurvedic science, which deals with various aspects of preventive health care. Rasāyana Cikitsā plays an important role in promotion of health & prevention of disease

Rasāyana Cikitsā (*Rejuvenation* therapy) is the branch of Ayurvedic science, which deals with various aspects of preventive health care which aims at achieving a long and healthy life. To improve quality and quantum of life ‘Rasāyana’ has been explained in Āyurveda. Rasāyana is indicated in the healthy individuals as well as in diseased state.

Rasāyana Cikitsā is a specific method of treatment which has direct effect on the basic aspect of the body i.e. Agni, Srotas and Dhātu’s. Rasāyana increases strength of body tissues, builds up resistance power and prevents the diseases. Rasāyana Cikitsā literally means rejuvenation therapy. Rejuvenation means to sustain youthfulness i.e to preserve normal physiological condition.

Rasāyana (Rejuvenation therapy) is described elaborately in four padas of the first chapter in Cikitsā sthana of Charaka saṁhitā. In the beginning of Rasāyana therapy Charak Ācārya explains the term Bhesaja i.e. drugs and its two types as follows. (Ch.Chi.1/1/3.)

Bheshaja are of 2 types:

1. “Swasthasyaurjaskara i.e. those which improve or enhance the state of health in healthy individuals (Ch.Chi.1/1/4)
2. “Kinchit Artasya Rognut” i.e. those which are useful in diseased conditions (Ch.Chi.1/1/4)

Methods to promote health and prolong life span include Vajikaran and Rasāyana therapies.

स्वस्थस्योर्जस्करं यत्तु तदृष्यं तद्रसायनम् ॥<sup>3</sup>

Medicine belonging to first category is considered to be useful for a healthy person to maintain & promote health, which include use of Rasāyana therapies and drugs.

The Rasāyana Cikitsā is based on re-generative theory which includes rejuvenation of the body. It is beneficial for promoting life, improving the strength of the body, delay aging, and treating diseases. Even in treatment aspect, it is the safest method for children, old aged, critical stages of complicated diseases etc., where the constitutional resistance is least and vital capacity is at its lowest. The references from Samhita’s highlight importance of Rasāyana as therapy used to protect life, improve health, and enhance Bala (strength of the body) and to treat disease conditions.

Rasāyana Cikitsā is a therapeutic process of the development of a person at the Sharirika level and Manasika level. Integration, growth & development of the body are the important events related to healthy life. This is the continuous process of life occurring in breathing, circulation, food metabolism, sense perception and the functions of nervous system, even the processes of thinking or memory.

The life process occurs in the total constitution and at smallest cellular level, generating healthy tissues, organs, repairs of the damaged cells & to maintain the normal physiological functions of the body in manner to protect from various illnesses.

Rasāyana Cikitsā is directly related to the process of metabolism which occurs at different stages in the body. Rasāyana Cikitsā is also termed as 'regeneration' because of the same reason. The ongoing process of formation of Rasa Dhatu i.e. the nourishing substance of the human being, which helps to increase life span, memory & intelligence, youthfulness, tone, Bala (strength), freshness, indriya (sense organs) and Mana (mind). Rasāyana gives longevity i.e. increased life span and healthy life through regeneration of the body tissues and cells in the optimum quality.

The Ayurvedic Samhita's have defined Rasāyana as a therapy to protect the Dhātus i.e. structural entities of the body up to their natural state of health, integrity & functionality, so as to achieve a healthy body with renewed development, growth and Bala (strength). Rasāyana thus can be understood as ideal therapy for Dhatu's i.e. regeneration of the body's structures.

Rasāyana Cikitsā should primarily pose qualities of preserving life and developing structures i.e. Dhatu's. Rasāyana Cikitsā also should have food-values, in terms to be newly mixed with Rasa Dhatu to nourish the body and build the other Dhatu's at different metabolic processes. The reconstruction of the body is based on these metabolic processes which start at Rasa Dhatu. That's the prime reason for the complete therapy to be termed as Rasāyana where Rasa being the prime objective for success of the therapy.

Rasāyana Cikitsā is a therapy which helps attain the utmost quality of the Dhatu's i.e. tissues, which in turn helps provide Sharirika (physical) as well as Manasika (mental) Swasthya i.e. health, thereby preventing or delaying the process of Jarā i.e. ageing and also to protect oneself from disease conditions, nourishing in all the aspects, thus providing a healthy and longer life span with youthfulness.

The core of Swasthya Urjaskara i.e. enhancement of health is

- To delay the natural ageing process of the body
- To control the effects of Apraharsha (reduced excitement, pleasure or libido),
- To improve the Dhātu Kshaya due to various physical, mental or sexual activities or Anupachita Śukra (incompletely nourished, particularly improperly developed Śukra Dhātu).

The above description suggests that which corrects the ill state, and restore the damage of Dhātu's due to all the above said factors and promotes health (Urja) is called health promotive (Swasthasya Urjaskara) for a healthy person. Rasāyana means achieving the better qualities of Dhātus which means to gain the appropriate development of the Dhātus. Rasāyana is to withstand further ageing and to achieve healthy long life. Rasāyana Cikitsā helps to attain uttam Bala (strength), long healthy life, vitality, sthairyā (stability) and controlled ageing process with the pharmaco-dynamic qualities present in the various Rasāyana dravya's. Rasāyana Cikitsā helps prevent genesis of ageing or Jarā by using specific Rasāyana dravya's & food essence supplying products to get rid of ageing. Through Rasāyana Cikitsā one achieves optimum quality of Rasa Dhātus to all seven Dhātus. Rasāyana Cikitsā is the means of producing the best quality of Rasadi seven Dhātus<sup>4</sup>.

**HISTORICAL BACKGROUND:**

No direct references are available in any of Vedic literatures about Rasāyana Cikitsā. References regarding the beneficial effects of Rasāyana Cikitsā such as prolonging the life span, maintaining or establishing the youthfulness and also delaying the ageing process can be cited. In Rig-Veda, there are hymns saluting Ashwinis for their effective approach in maintaining the equilibrium of Tri-Dhātus and prolonging the life span<sup>5</sup>. Ashwinis, known as Devanam Bhishajau', were expert in the field of Rasāyana.

Their deeds concerned with Rasāyana are as follows:

- Turned Kaksivan young from old<sup>6</sup>.
- Kali was turned into a young subject<sup>7</sup>.
- Chyavana became younger and his life span got increased<sup>08</sup>.
- Citizens of Jahnu were endowed with strength and longer life span<sup>09</sup>.
- Ghosa who was diseased, old and unmarried was turned into a healthy and young lady who later got married<sup>10</sup>.
- Injured Syava was treated effectively and his life span lengthened<sup>11</sup>.
- Old sage Vandana was converted into a youth<sup>12</sup>.
- The life span of Somaka, the son of Sahadeva, got lengthened<sup>13</sup>.
- Devas became Ajaramara by consuming the elixir which was originated during.
- Samudra manthana and so are the seven great sages (Sapta Chiranjivis).

In Yajurveda also, one can notice the chants increasing the life span and beneficial effects of Rasāyana such as improving the status of

Indriyas. The prayer to Almighty God frequently seen to increase the life span of an individual<sup>14</sup>.

Atharva Veda, to which Āyurveda is closely related, gives more references of Rasāyana. Some of them are listed below:

Aap (water) is considered as the best medicine in the universe and it is the best Rasāyana Dravya<sup>15</sup>.

Devas (Gods) neither become old nor they become a victim of death<sup>16</sup>.

Aap (water) increases the Urja (strength) of the body<sup>17</sup>.

The individuals will be devoid of gray hair and mental instability, having strong teeth and body and perfect body activities. Soma, the king of medicines, was given due importance in all Vedas, Brahmana Granthas, Upanishads, Puranas and later in Saṃhitās<sup>18</sup>.

A reference from Taittiriya Brahmana indicates the practice of Rasāyana by which sage Bharadwaja was turned younger four times by Lord Indra. Similarly, Upanishads, Puranas and other post Vedic treatises have highlighted the practice of Rasāyana. Charak Samhita has dedicated the first chapter for Rasāyana in Cikitsā sthana and divided into four Padas. Rasāyana has been given first preference because it not only maintains the healthy state of an individual but also cured ailments, the two faces of Cikitsā. Suśruta also dealt Rasāyana in four separate chapters in Cikitsā sthana where Vāgbhata have described in only one chapter in Uttarantra. Later compilations like Bhavaprakash, Sharangadhar Saṃhitā, and Yogaratnākara have also dealt Rasāyana in a separate chapter which followed Vāgbhata.

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## References from Samhitā's

### **Charaka Samhitā**

Charak Samhitā the oldest & supreme text in relation to Cikitsā has given extensive consideration on the subject of Rasāyana. In the beginning of Cikitsā sthana Chapters on Rasāyana therapy and Vajikarana are explained. Cikitsā sthana begins with a chapter on Rasāyana therapy dealing with the physiological, pharmacological, therapeutic and clinical aspects of the Rasāyana. Charaka Ācārya appears to have correlated this with the fundamental principles of Āyurveda as related to the concept of Ras Samvahan, the concept of Dhātu, the Agni, the Srotas, the Doshas and the Dosha Prakriti. Charaka Ācārya advised two major types of Rasāyana i.e. Kutipravesika & Vatatpika (indoor and outdoor regimen) and explained a variety of Rasāyana drugs both the single and compounds, herbs and minerals (Ch.Chi 1/1/16). The knowledge appears to have been so much developed that Rasāyana therapy has been designated as one of the eight major branches of Āyurveda specialized in prevention of diseases and a tool in maintaining and promoting the health of a healthy individual<sup>19</sup>.

### **Chakradutta**

Chakradutta emphasizes the role of Sanshodhana therapy as a Poorvakarma for Rasāyana therapy. References of Rasāyana drugs like Chyavnaprash, Bhallataka yoga, Vardhmaan Pippali Rasāyana, Agastya Haritaki, Vyaghri Haritaki and Loh Rasāyana etc. are available in this Samhitā. Chakradutta advised use of Haritaki in various seasons under the term Ritu Haritaki to be undertaken by every healthy individual to prevent disease arising through seasonal changes. Description of certain minerals like Loha, Shilajatu, Swarna, Rajat and Tamra is seen under Rasāyana. Chakradutta has also described use of Rasāyana Drugs In younger and middle age groups<sup>20</sup>.

**Suśruta Saṃhitā**

Rasāyana described in Suśruta saṃhitā is similar to Charaka Saṃhitā but the presentation of Rasāyana therapy is in different ways. Suśruta Ācārya omitted the philosophical aspects of subject. Suśruta Ācārya has not elaborated any specialized regimen of Rasāyana Therapy like Vatatpika and Kuti-praveshika procedure of Charaka saṃhitā. A unique contribution from Suśruta Saṃhitā is advising the use of Ahara for Rasāyana treatment which seems to be an important contribution. Dalhana while commenting on Suśruta Saṃhitā considers this context comparable to Kuti-praveshika procedure of Charaka Saṃhitā. The most important contribution of Suśruta Ācārya and the commentator Dalhana in understanding of Rasāyana therapy is the classification of Rasāyana (Su.Su.1/10 Dalhana) which describes that Rasāyana therapy has two aspects<sup>21</sup>:

1. Kamyaa Rasāyana
2. Naimittika Rasāyana

Rasāyana drugs mentioned Suśruta Saṃhitā are:-

Single drugs<sup>21</sup>

- Kala-megha
- Varahi Kanda
- Golami
- Chattra
- Atichatra
- Gambhari Phala
- Shwetakshi
- Karvir

### Formulations<sup>21</sup>

- Shweta Bakuchi Yoga
- Krushna Bakuchi Yoga
- Vacha Rasāyana
- Shatpaka Vacha ghrita
- Ayur-varadhaka Rasāyana
- Nilotpala Kwath
- Vasa taila Yoga
- Rasāyana Samrthaprad Yoga
- Daridrya Nashak Yoga
- Yavadi Yoga.

Some other Dravya's like, Kashmari, Vacha, Brahmi, Vidanga are mentioned for their Rasāyana uses. Also 24 types of somas have been highlighted under the Rasāyana chapter.

### **Vāgbhata**

Aṣṭāṅga a Sangraha and Aṣṭāṅga Hridaya written by Vāgbhata Ācārya appear to have included the descriptions of Charaka Saṃhitā. Few newer drugs have been introduced in these texts. The types of Rasāyana i.e. Ācāra Rasāyana, Vatatapika Rasāyana and kuti praveshika Rasāyana etc. are same as per the references of Charak Saṃhitā. Vāgbhata Ācārya highlights importance of the age factor in selection of people for the use of Rasāyana, which as per Vāgbhata Ācārya is Rasāyana should be used in young or middle age groups. Such references are not is seen for prescription of Rasāyana therapy in younger age groups in other Saṃhitā's. Vāgbhata Ācārya has also mentioned about the use purva karma i.e. certain acts to be followed before the administration of Rasāyana drugs<sup>22</sup>.

### **Bhel Saṃhitā**

Bhel Saṃhitā which is supposed to be writing during the same period as that of Charak Saṃhitā is not available in complete form. Ācāra Rasāyana has been mentioned in this Saṃhitā. Bhel Saṃhitā describes Rasāyana in chapter named “Dirghayushyopaya”. Indication of Rasāyana in “Rajyakshama” which is closely resembled to tuberculosis is seen Bhel Saṃhitā. Pippali Rasāyana and Pippali Vardhman Rasāyana are highlighted. Rasāyana in the form of Basti for Śukra Shodhana or Rasāyana Basti can be seen in Bhel Saṃhitā<sup>23</sup>.

Rasāyanas preparations elaborated in Bhel Saṃhitā are:-

1. Jeevakadi Ghrita
2. Maha-sneha
3. Shatavaryadi Basti
4. Pancha moolyadi Rasāyana
5. Sukumar Taila

### **Kāśyapa Saṃhitā**

Kāśyapa Saṃhitā is not available in the complete form. Kāśyapa Saṃhitā does not have any separate chapter dedicated for Rasāyana Cikitsā. There are scattered references of Rasāyana Cikitsā in different context of the Saṃhitā. Rasāyana Cikitsā is specially indicated in the treatment of “Rajyakshma”. Rasāyana Cikitsā has also been advised to be used in cases of Kshaya and in Ksheena<sup>24</sup>.

Dravya’s mentioned in Kashyapa saṃhitā:-

#### Single drugs

- Braahmi
- Lasun

#### Formulations<sup>24</sup>

- Shatapushpa Kalpa
- Lasuna Kalpa
- Madhu & Sarkara

References of various types of Kshira and Mamsa as Rasāyana can be seen in Kāśyapa Saṃhitā. Nagabala, Yastimadhu, Braahmi, Rasona, Mandookparni etc. are mentioned in the management of “Rajyakshama” i.e. tuberculosis. While describing the properties of Shata-pushpa, shatavari and Lasuna Kalpa, Kāśyapa highlights concepts of bruhmana, Balakara, Vrushya, Varnya & Oja-varadhan, Ayusha vardhak, Smriti, Medha Vardaka, Vayasthapana etc. properties Rasāyana Cikitsā. Kāśyapa Ācārya has also indicated purva Karma for Rasāyana Cikitsā<sup>24</sup>.

### **Śāraṅgadhara Saṃhitā**

In Śāraṅgadhara Saṃhitā specific description on Rasāyana Cikitsā is not seen but references about Rasāyana Cikitsā can be studied in the saṃhitā. The significance of Rasāyana Cikitsā in Śāraṅgadhara Saṃhitā is the definition of Rasāyana which has been elaborated. Śāraṅgadhara Saṃhitā defines Rasāyana as means by which one can delay ageing and helps prevent diseases conditions thereby maintaining the positive health of an individual<sup>25</sup>.

Single Rasāyana drugs mentioned in Śāraṅgadhara Saṃhitā are:

- Amruta
- Rudanti
- Guggul
- Haritaki
- Suvarna

Formulations<sup>25</sup>:-

- Loha Rasāyana
- Kamdev Ghrita
- Chyawanprasaha Avleha
- Agasthya-haritaki Avleha
- Kaishor Guggulu
- Yogaraj Guggul

### **Bhāvaprakāśa**

An independent chapter on Rasāyana is explained in which a comprehensive definition of Rasāyana and a various Rasāyana dravya's and preparations are included. Long healthy life and enhanced mental health is supposed to be few important effects of Rasāyana Cikitsā. Mandukpaarni, Ashvaganda, Haritaki, Guggul etc. are explained with special consideration. Bhāvaprakāśa Saṁhitā emphasizes on the importance of sam-shodhan Karma as a Purvakarma for Rasāyana Cikitsā<sup>26</sup>.

### **Yogarātnākara**

Yogarātnākara has independent chapter on Rasāyana. Madhya as Rasāyana has been explained in this Saṁhitā. Jala (water), Dugdha (milk), Madhu (honey), and Ghrita are advised as Rasāyana and specific description on Haritaki as Rasāyana has been given. Description of Vardhamana Bhallataka Prayoga has also been elaborated<sup>27</sup>.

While practicing Rasāyana Cikitsā, following points are considered to be of main importance

- Prakruti (Constitution)
- Vaya (Age of the person)
- Satmya
- Dhātus (structural organization of the body)
- Srotas (systems)
- Agni (Digestive fire)
- Oja

Along with Rasāyana Cikitsā, Yogarātnākara has also advised that a person desirous of optimum results of Rasāyana should consume a suitable regime of diet and follow a specific code of psychosocial conduct as prescribed in Ācāra Rasāyana<sup>27</sup>.

**ETYMOLOGY:**

The term Rasāyana is formed from two words viz. Rasa and Ayana.

The word 'Rasa' is formed from 'Ras Gatau' Dhātu and 'Ac' Pratyaya. Ācārya have given various meanings for Rasa at different contexts. Some of the common are

1. Rasa is one that is experienced by Rasanendriya.
2. The one that nourishes Rasa, Rakta, etc. Dhātus (continuously) daily is called Rasa.
3. The essence of the digested foodstuff is known as Rasa.
4. The one that traverses throughout the body due to its liquidity is termed Rasa.
5. Rasa is one that moves all over the body continuously.

The word Ayana has various meanings as given in ShabdhaKalpa Druma and Vachaspatyam. They are pathway, movement, road, place, site, abode, a way of entrance, an entrance etc<sup>28</sup>.

Rasāyana means the pathway for essence of food substances towards all body tissue elements so as to nourish and replenish them. V.S. Apte, famous grammarian, in his Sanskrit English Dictionary, states that Rasāyana is - an elixir of life (elixir vitae) - any medicines supposed to prolong life and prevent old age - serving as an elixir vitae i.e., that which gratifies or regales. The classics have given the synonym Rasayani for Srotas which means Channels which carry nutrients for vivid body tissues.

### **Vyutpatti – Nirukti of Rasāyana**

Etymologically the term Rasāyana comprises of two components viz., *Rasa* and *Ayana*. *Rasa* - *Rasa* is derived from the root 'ras' meaning *gatou* or to move. The fluid that always moves from one place to another is termed as *Rasa*. This word is used liberally in various senses like Mercury, a taste, water, sap or juice, essence, essential fluid of the body etc. The word meaning of *Rasa* in *Rasāyana* is the body fluid necessary for the nourishment of the entire body.

*Ayana* is derived from 'Aya' meaning to flow i.e. through which the movements of materials take place<sup>29</sup>. Literally *Ayana* gives the three meanings such as *Jnana* (knowledge), *Gamana* (movement) and *Prapti* (attainment). *Rasāyana* means *Rasa Prapti*.

*'Rasanam Rasaraktadeenam, ayanam prapanam apyayanam va iti Rasāyanam'*

*Rasāyana* is that which causes *Apyayana* of *Dhātus* like *Rasa* and *Rakta* or that which promotes *ayu*, *bala*, *veerya*, *dardhya*, *vaya* and *Sthairya* from the factors which are present in the *rasa*, *veerya*, *veepaka* and, *prabhava* of the *bheshaja* or which establishes or ensures the assets which are not present.

### **Paribhasha**

*Dravya's*, *Ahara* (food) and *Vihara* (routines) which helps in promotion of longevity and prevention of aging and diseases are called *Rasāyana's*. *Rasāyana* is a therapy through which the drugs prevent the senility, cure the diseases, preserve the youthful state, improve the eye sight and act as restorative. A procedure by which *Rasadi Sapta Dhātus* are sanctified in all respects through proper nourishment is known as *Rasāyana*.

Thus Rasāyana improve the tissue nutrition. An ideal Rasāyana agent prevents premature aging, promotes intellect and memory, provides immunity against diseases and thus helps an individual in leading a long healthy and energetic life.

### **Prayojana**

Rasāyana Cikitsā helps in enhanced life span, Manasika swasthaya (mental health), intellect, and relief from diseases conditions, teja (luster), varnya (complexion), and improvement in voice, increased potential of the body and the Indriyas (senses) Vak-siddhi, respect and brilliance. Ācārya Suśruta describes the merits of this discipline of medicine as that which promotes longevity exceeding 100 years along with healthy status of life, maintains youthful state, improves intellect and Bala and provides capacity to fight against diseases by producing immunity.

### **Bheda (types)**

Following is the classification of Rasāyana

#### **According to the effect of Rasāyana**

1. Samshodhana Rasāyana
2. Samshamana Rasāyana

#### **Samshodhana Rasāyana**

There are certain Rasāyana drugs which when used may induce vama, virechana karma in the body and thus the body gets purified. Vitiated doshas are expelled from the body. These are called Samshodhana Rasāyana.

**Samshamana Rasāyana**

Samshamana group of Rasāyana drugs produces Rasāyana effect in the body restoring dosasamyā or internal homeostasis and metabolic constancy.

**According to the mode of administration**

1. Kutipravesika Rasāyana
2. Vatatapika or Saura-marutika Rasāyana

**Kutipravesika Rasāyana**

It is a type where samshodhana karma is essential. After Samshodhana patient enters into a specially constructed therapy chamber. He has to follow specific code and conduct of life with strict diet control. It is said that if Kutipravesika Rasāyana is carried out as per the norms laid down it leads to complete bio-physical transformation of man.

**Vatatapika Rasāyana**

It is indicated in those patients who do not have enough resources and who cannot afford intensive rejuvenative care. This therapy is used while leading normal life. Samshodhana karma is not essential in such cases.

**Special Rasāyana drugs and measures**

1. Medhya Rasāyana
2. Ācāra Rasāyana

**Medhya Rasāyana**

Some Rasāyana possess medhakara effect and hence they are specially known as medhya Rasāyanas. Medhya means anything that is beneficial for medha, which is responsible for Dhi (intelligence), dhriti (retention power) and smruti (memory).

**Ācāra Rasāyana**

It means rejuvenating life style with such social and personal conducts by which one can acquire the Rasāyana effect. It includes improved personal behavior, social behavior and Satvika Ahara. Ācāra Rasāyana is essentially a non-pharmacological approach to social and mental health care leading in turn to positive health and longevity.

**According to the objective**

- 1) Kamyā Rasāyana
  - i) Pranakamyā
  - ii) Medhakamyā
  - iii) Shrikamyā
- 2) Naimittika Rasāyana
- 3) Ajasrika Rasāyana

**Kamyā Rasāyana**

Kamyā Rasāyana is that which is used in healthy persons for maintenance and promotion of positive health.

**Pranakamyā**

It promotes longevity and lifespan.

**Medha kamyā**

It improves mental faculties.

**Srikamya**

It improves beauty and luster of the body.

**Ajasrika Rasāyana**

It is used in the form of Sattvika ahara consisting of Ghrita, Ksheera etc. Constant use of such nourishing diet produces non-specific Rasāyana Prabhava in the body.

**According to the use**

Ācārya Suśruta explains the concept of Rasāyana in four chapters in Cikitsā sthana where he classifies them according to their utility.

1. Sarvopaghata Shamaneeya
2. Medhayushkameeya
3. Swabhava Vyadhi Pratishedhaneeya
4. Nivrutta Santapeeya

**Sarvopaghata Shamaneeya**

It is the Rasāyana therapy that concentrates on relieving all possible obstacles to the health and longevity.

**Medhayushkameeya**

It is the Rasāyana therapy that aims at promoting intellectual power and longevity.

**Swabhavavyadhi Pratishedhaneeya**

It is the Rasāyana therapy having the aim to relieve Swabhavika Vyadhis or naturally occurring Kshut, Pipasa, Jara, Mrutyu, Nidra etc.

**Nivrutta Santapeeya**

It is a type of Rasāyana procedure administered with an aim to relieve the dukha concerning both Shareera and Manas.

**Naimittika Rasāyana**

In Āyurveda, Naimittakara Rasāyana is explained in the management of specific diseases. These include single drug as well as compound preparations of both herbal and herbo-mineral origin indicated in patients of specific disease in order to promote the vitality.

Naimittika Rasāyana are not collectively explained in any chapter in the classics while compound preparations containing Rasāyana drugs specific to the diseases and Srotas are explained under general treatment of each diseases. Innumerable numbers of Naimittika Rasāyana Yoga are found in the classics for example Agasthya Haritaki Rasāyana in Shwasa Roga.

Naimittika Rasāyana does not mean treatment of a specific disease, but used as an supportive to the specific treatment. It aims at correcting the physiological factors like Agni, Srotas, Dhātus thereby helping to cure the disease faster and bringing back the normalcy. It treats the emaciation caused by the pathological factors of the disease by promoting Dhātu Poshana. It also helps in increasing Oja and thereby Bala of the patient to withstand the severity of the disease and to fight against the diseases.

**Ajasrika Rasāyana**

Ajasrika Rasāyana is one among the classification of Rasāyana, where consuming of the Rasāyana Aushadhi is indicated daily. The constant use of such Rasāyana produces specific Rasāyana effect in the body. Ācārya Dalhana has explained Ajasrika Rasāyana in the form of Dugdha and Ghrita.

**Indications of Rasāyana**

Rasāyana is indicated to be administered only after appropriate Samshodhana Karma followed by Samsarjana Karma. It can be used according to the necessity but several factors should also be considered such as Vaya, Satmya, Desha, Prakruti, Kala, Dhātu and Vyadhi.

Ācārya Suśruta have indicated that Rasāyana to be administered in Poorva Vaya and Madhyama Vayas<sup>30</sup> which are 16-30 years and 30-60 or 70 years respectively, to get maximum benefit and it is said to be not useful in Vriddhavastha and in children. Commentator Gangadhara clarifies that this is because they cannot tolerate the Samshodhana therapy and persons who are fit for shodhana are also eligible for Rasāyana therapy<sup>31</sup>. Also, there are specific Rasāyanas for specific age groups that help in restoring the loss of specific bio values of the respective ages.

It should be administered to the suitable persons who are devoid of grief and possess required Bala. Generally Rasāyana is contraindicated in these persons who are Alasi, Daridra, Pramadi, Vyasani, Papakrud, Bheshajapamani, and also the persons with evil designs, who is not free from diseases and who has no faith in this therapy. Rasāyana therapies produce effects in persons whose mind and body are pure and self- controlled.

**Time for Rasāyana drug**

Suśruta Ācārya advices to use Rasāyana dravya's in middle age, as it is more beneficial in middle age. The administration of Rasāyana dravya's during this period of life will stimulate tissue growth and retard degenerative changes.

## **Rasāyana and Swasthya (health) relationship**

### **Definition of Swasthavritta: (Healthy Regimens)**

The word “Swasthavritta” is made of three words – Swa, stha and Vritta, where Swa & stha represents a disease free condition of self and vritta is the regimen or methods or means to attain the same according to Āyurveda. Those all vritti i.e. efforts which help to maintain balance between Dosha, Dhatu’s and Mala, and which are beneficial for carrying the normal functions of the body is termed as swasthavritta. Swasthavritta helps to achieve the goal of complete health and well-being.

The regimens to be followed to attain optimum levels of health are Swasthavritta. The essence of Āyurveda is the theory for preserving the health of healthy individual and prevention of diseases. Even after centuries past, even the nature of disease has evolved; newer illnesses have replaced some of the old. Still, concept of Ayurveda for maintenance of health and prevention of diseases withstands the present world. This concept of maintenance & promotion of positive health, ways to prevent or protect oneself from harmful effects of the illness is "Swasthavritta"

### **Definition of Swastha: (Health)**

Charak Ācārya has used the various terminologies like Prakriti, Swastha, Sukha, Arogya, Dhātu samya as substitutes for Swasthya. Instead of defining the Swastha in Swastha chatushka, Charak Ācārya has defined Swastha in Nirdesha Chatuska by Nirdesa Tantrayukti as "disorder is disequilibrium of Doshas and Dhātus, and their equilibrium is health. Health is known as happiness while disorder is unhappiness"

Arogya has two syllabuses. ‘Aa’ and ‘Rogya’ the former means "till or up to" the condition; the latter openly signifies the condition that renders a

man liable to be caught by diseases. Arogya or health is thus a physical condition of a being in which the body is immune to all disease.

Suśruta Ācārya defines a Swastha Purusha as<sup>32</sup>:-

- A person having equilibrium of the Doshas i.e. Sama dosha.
- A person having normal functioning of Agni i.e. Sama Agni
- A person having normal condition of all Dhātus i.e. Sama Dhātu
- A person having normal functions of Mala i.e. Mala kriya.
- The Atma, the Indriyas (senses) and Mana (mind) should be happy and cheerful i.e. Prasannatamendriya mana.

The modern definition of health seems to be incomplete in comparison with the excellent interpretation of health described in Suśruta Saṃhitā where the concept of spirituality is found to be missing.

### **Positive Health vis-a-vis Dhātusamyā:**

In Charka Vimana sthana, criteria for the assessment of Dhātusamyā were explained. This includes the entire feature, which is necessary to achieve positive health.

Biologically, positive health is a state, in which every cell and every organ is functioning at its optimum capacity and in perfect harmony with the rest of the body. It is represented by Samadosha, Samagni, SamaDhātu malakriya.

Its criteria can be summarized as

- Normalcy of voice and complexion
- Increase in strength
- Desire for food
- Relish the meal time

- Timely evacuation of flatus, urine feces
- Proper and timely digestion of taken food

Psychologically, as a state in which the individual feels a sense of a perfect well-being and mastering over his environment.

Socially, as a state in which the individual feels his capacity for the participation in social systems at its optimum.

‘Prasannatmendriyamana’ denotes both psychological and social positive health. Criteria for assessment are:

- Timely sleep
- Nonappearance of abnormal dreams
- Easy awakening
- Overall normalcy of mind, intellect and sense organs

Suśruta Ācārya in Suthrasthana 15 systematically defines this, as particular sequence of explanation is reflecting Karya Karana Vada. The equilibrium state of Dosa is Karana for the Karya Samagni and its Karya is SamaDhātumalakriya; in total, this results in Prasannatmendriyamana. There by achieving total health.

### **Characteristics of Swastha:** (Healthy Individual)

Individuals having proportionate musculature and compactness (Sama mamsa and Sama samhanana) of the body with strong sensory organs will overcome.

- Onslaught of diseases
- Can withstand hunger and thirst
- Can withstand heat of the sun and cold
- Can withstand physical exercises

- They can digest and assimilate the food properly.

### **Concept of 'Swastha' and 'Swasthya'**

Āyurveda advocates multi-dimensional concept of health Absolute healthy status is a difficult proposition Ultimate aim of the life – Purushartha chatustaya. Positive health can be achieved through means of chaturvidha Purushartha

### **Swastha Vs Swasthya**

Swasthya-(Health) Health cannot be defined as a State Setting Universal health standard is not possible.

Swastha-(A healthy person) Process is continuous adjustment Parameters Vary with prevailing ecological Conditions.

The motive of Āyurveda is to prevent the disease and to maintain the healthy state of the healthy individual. As directed in Swasthavritta one who follows Ayurvedic lifestyle achieves a long and healthy life. The individual thus gets respectful position in the society and achieves Purushartha chatustayas.

The shareera is defined as the entity which is combination of the pancha mahabhuta vikara samuha and which is samyogavahi when this shareera has the vitiated Dhātu then it starts getting rogas the vitiation starts with the either with the Vridhi or Kshaya of the Dhātu which is depicted by the organ or the human constitution

Equilibrium of Dhātus is called as health and vitiation in the Dhātus itself is called disease condition so it is very prime factor that maintenance of Dhātu samyata

**W.H.O. definition of Health**<sup>33</sup>

Health is defined as a complete state of physical, mental, and social well-being of a person and not the merely the absence of disease or infirmity.

**Regimen's to achieve Swasthya- (Health)**

The man who indulges in -

- Pathya Ahara (Wholesome food) & Sadvritta (good conduct)
- Moves cautiously
- Unattached to senses
- Donate
- Equality
- Satya (truth)
- Devoted to authority

Thus, Swasthavritta provides means through Ayurveda standard of living which enables an individual to fulfill his vyaktika (personal) and Samajika (social) needs to the fullest. In simple words, it enhances the qualitative as well as quantitative aspects of the individual perspective and its social attachments. By considering fourfold necessary and scope, Ācārya Charak has dealt topic of Swastha (health) in separate Chatuska known as Swastha Chatuska.

**Parameters for assessment of Arogya Lakshana**

The features of Arogya explained in Kashyapa Samhitā<sup>34</sup> as follows.

1. Ānabhilasha (desire for food)
2. "Bhuktasya paripaka (easy digestion of food)
3. Srusta vinmootratwa (excretion of feces urine and flatus)

4. Shareerasya laghavam (lightness of body)
5. Suprasnnendriyatwa (perspicuity of indriyas)
6. Sukhaswapna prabodanam (comfortable sleep and awakening)
7. Bala varna ayushya labha (attainment of strength complexion & life)
8. Soumanasya (happiness)

Every individual in this world wants to live healthy for a long period. Rasāyana Cikitsā i.e. Rejuvenation therapy is explained in Āyurveda for healing and regeneration of living tissues i.e. Dhātus in the body.

Rasāyana (Rejuvenation therapy) is one of the eight branches of Ayurveda. Rasāyana is specialized procedure used in form of rejuvenate methods and Dravya's, nutrition and Ācāra (codes of conduct) or behavior i.e. Ācāra -Rasāyana.

*“Labopayo hi Shastanam Rasadinam Rasāyanam”*<sup>35</sup>

Rasāyana (Rejuvenation therapy) means the way for attaining excellent Rasa i.e. one attains longevity, memory, intelligence, freedom from disorder, youthful age, excellence of luster, complexion & voice, optimum strength of physique and sense organs, successful words, respectability and brilliance.

### **The effect of Rasāyana** (Rejuvenation therapy)

Considering the Ayurvedic concepts of physiology, Rasāyana agent promotes nutrition through one of the following three modes:

- By direct enrichment of the nutritional quality of Rasa (nutritional plasma) - Shatavari, milk, ghee etc.
- By promoting nutrition through improving Agni (digestion & metabolism) - Bhallataka, Pippali etc.

- By promoting the competence of srotas (microcirculatory channels in the body)-Guggulu.

Another important factor for maintaining good health and staying active even in the old age is called as rejuvenation therapy (Rasāyana Cikitsā). Therefore, a healthy person should take rejuvenating preparations to maintain good health and stay young. There are many such Ayurvedic preparations available, which can be taken according to season and personal constitution.

Good social conduct, morality, good manners and good character are some other factors, which are necessary to stay away from diseases. Thus, Āyurveda approaches the complete individual while giving instructions about maintaining the health. Rasāyana Cikitsā is meant to control the ageing process and to delay the destruction of the body.

- Rasāyana Cikitsā improves the Dhi Dhruti, Bala (strength), teja (luster of the skin), and vak-siddhi (voice).
- Rasāyana Cikitsā nourishes the Dhatu's, and thus prevents chronic diseases or illness.
- Rasāyana Cikitsā Improves Agni i.e. the metabolic activities of the body and prevents diseases related to ageing.
- Rasāyana Cikitsā helps to attain highest level of physical strength i.e. Bala and optimum functions of the sense organs.
- Rasāyana Cikitsā has specific action on reproductive system which helps in the production of good quality of Śukra Dhātu.
- Rasāyana Cikitsā helps in the nourishment of the body thereby improving the defense mechanism and the natural resistance of the body to various diseases.

Ācāra Rasāyana helps at spiritual level to increase Satva guna which is useful in day to day routines like speaking truth, controlling angry, sense organs and providing calmness to mind and soul.

Considering these various effects of Rasāyana indicating the use of Rasāyana Cikitsā, will lead to a healthy long lifespan, youthfulness and free from all the ailments of the body with delayed ageing process. Rasāyana Cikitsā or Rasāyana dravya's may also have immunity enhancing effect which helps prevent diseases which protects body from the disturbances in Dosha, Dhatu's thereby allowing them to carry their normal function & maintain the healthy state of individual.

### **Need For Rasāyana in Swastha**

(Rejuvenation therapy for healthy person)

1. Hita and sukha Ayu
2. Promotion of positive health
3. To achieve chaturvidha Purushartha
4. To avoid Akalaja jara and to delay

**Ācārya Śāraṅghara explained the Rasāyana according to the age group** <sup>36</sup>

Table 1 - Rasāyana According to Age

AGE (in years)	DRAVYAS (Drugs)
1 yr.- 10 yrs. (Bala)	vacha, Suvarn, kasmari
11 yrs. - 20 yrs. (vruddhi)	Kasmari, Aswagandha, Bala
21 yrs. - 30 yrs. (chabbi)	Loha, Amla
31 yrs.- 40 yrs. (Medha)	Shankh-pushpi, Jyotish-mati
41 yrs.- 50 yrs. (twacha)	Soma-raji, Bhrungaraja,
51 yrs.- 60 yrs. (Drushti)	Jyotish-mati, Triphala, loha
61 yrs.- 70 yrs. (Veerya)	Atmagupta, vajikaran dravyas
71 yrs.- 80 yrs. (Vikram)	Bala, Amla
81 yrs.- 90 yrs. (Buddhi)	Brahami, Shankh-pushpi
91 yrs.- 100 yrs. (Karmendriya)	

Rasāyana are formulated with the intention of bringing back into balance one or more of the five elements, which are put out of balance from improper diet etc. In return, this promotes balance on the physical, mental and subtle levels of our being, which will add life to our years as well as years to our life.

**Rasāyana for Healthy Individual**

Āyurveda, a life science, gave the unique concept of balanced diet under the heading of Nitya Sevaneeya Dravya (Foods that are permissible to eat on daily basis). Promotion of proper nutrition is one of the eight elements of the Primary Health Care.

Though great advances are made in the last fifty years in the knowledge of nutrition & practical application, poor section of the population continued to suffer from malnutrition in spite of increase in the food production. To bring global attention towards Ayurvedic system of medicine in concern to nutritional programme and to implement & to develop more nutritional programme in our system, a great interest has to be focused on the role of dietary factors in the promotion of health.

Nitya sevaneeya Dravya's explained in Suśruta and Vāgbhata Saṃhitā, indicates the need for the Rasāyana for healthy individual. The list of food ingredients those are advisable to consume daily are Shashtika shali (unpolished rice), Godhuma (wheat), Yava (barley), Mudga (green gram), Pathya (), Amalaki (Indian gooseberry), Mridwika (dry grapes), Dadima (Pomogranate), Triphala, Patoli (snake gourd), Madhu or Kshoudra (Honey), Sharkara (sugar), Sarpi (ghee), Jangala mamsa (meat of animals), Saindhava (salt), Antariksha jala or divyodaka (pure water).

**Mode of Action of Rasāyana**

The word Rasāyana essentially refers to acquisition & circulation of nutrition needed to provide nourishment to the body tissues and tissue perfusion. Hence it may be presumed that a Rasāyana agent acts at any of the following three levels, viz. Rasa, Agni, and Srotas.

**Rasa**

Rasāyana agents might enrich the nutritional quality of poshaka rasa as most of them physically contain high quality of nutrients in their bulk and when administered; it is added to the nutrients present in the Poshaka rasa and in turn help in improving in Dhātu Poshana. Eg: Ghrita, Ksheera, Shatavari, etc.

**Agni**

Rasāyana agents improve the Agni Vyapara and thus promote Dhātu Poshana. Several Rasāyana drugs are known to have Deepana and Pachana properties by the virtue of their qualities like Laghu, Ushna or by Prabhava, thereby promote the functions of Koshatagni for the digestion of food and of Dhatvagni to vitalize the metabolic activity, resulting in turn to improved nutritional status at the level of Dhātus. Ex: Pippali, Bhallataka, etc.

By their virtue of Deepana and Pachana action they digest and destroy the specific Ama present in the Srotas and also help in removing the obstruction in the Srotas. By this the Naimittika Rasāyana act as adjuvant to the specific Vyadhihara medicines prescribed for the disease and enhance their effect.

By the above actions they facilitate the adequate movement of Dhātus relative to the Srotas and also the rasa which is carrying the doshas thus the mala sanchaya roopi ama is removed. This helps in the scavenging of the Srotas.

**Srotas**

Some of the Rasāyana drugs promote the functions of Srotas which helps in supply of nutrients to the cells & tissues improving cellular perfusion. This is one of the mode through which a Rasāyana Cikitsā may work in promotion of nutritional status. Ex: Guggulu.

**Rasāyana and Vyadhikshamatva**

Rasāyana by virtue of their qualities, actions and prabhava promote Oja. Oja is considered as the quintessence of all Dhātus of the body. It is this Oja which is responsible for imparting Bala in an individual.

Bala or resistance or Vyadhikshmatva is responsible for an individual to guard himself against diseases and infection.

Vyadhikshmatva is classified into two types namely, vyadhi utpadaka pratibandhakatva and Vyadhi bala Virodhitva. The first type is Bala or resistance of a person against the onset of a disease. It is produced by general Rasāyana in the body. The second type is achieved by the timely administration of Naimittika Rasāyana.

There are various levels of actions of the effect Rasāyana Cikitsā in general on nutritional aspects. Some Rasāyana Dravya's may have beneficial effect on certain targeted Dhātus and organs like brain (Medhya Rasāyana), lungs, eyes etc. It may be assumed that they provide specific medicinal nutrients for the respective cells & tissues and promote growth & development of specific peculiar healthy functions. Similarly Naimittika Rasayana explained in classics for each disease have some medicinal nutrients for respective tissues and Srotas and promote Bala or Vyadhi Bala Virodhaka type of resistance to that particular Srotas.

**Rasāyana and Doshahara Action:**

Naimittika Rasāyana has Doshahara action also by the virtue of their qualities and properties. These might act specifically on the sthanika Dosha present in the Srotas and palliate the aggravated ones or promote the diminished ones.

These entire actions specific to the Srotas are achieved in all the disorders concerning that Srotas. Hence, Naimittika Rasāyana is usually indicated in the multiple disorders specific to the Srotas in the classics and it provides promotive, preventive, curative and rehabilitative health care.

Modern nutritional supplementations may not fulfill the requirement, as they do not correct metabolic derangements. But Rasāyana Aushadhi exerts their efficacy by correcting Dhatvagni and clearing the Srotas due to Deepana and Pachana effects.

Rasāyana Tantra is one of the branches of Aṣṭāṅga Āyurveda. Rasāyana Cikitsā improves Agni i.e. digestive fire in turn supplying appropriate nutrients leading to improvement in the biological requirements of the body. This improved state of nourishment is supposed to lead to a series of secondary effects like prevention or delaying of ageing and longevity, improved immune response to the disease conditions, enhanced mental capabilities, increased vitality and luster.

**Drug is having the following properties may be considered as Rasāyana:**

- ✓ Promotes the Physical and Mental Health.
- ✓ Improves Over all personality.
- ✓ Prevents Ageing as well as cures ageing related problems.
- ✓ Prevents diseases and provides relief in diseases.
- ✓ Produces the tissues of the best/optimum quality

**Merits of Rasāyana Therapy:**

The following lines illustrate the facts about the uses of vitalization therapy - “long life, increased memory and intelligence, freedom from disease, youth, excellence of luster, complexion, voice, strength of body and mind are obtained by vitalizers.” These materials termed as

“Rasāyana” may be inducers of beneficial enzymes, hormones during health and disease.

Rasāyana therapy arrests ageing (Vaya-Sthapan), increase life span (Ayushkarm), intelligence (Medha), strength (Bala) and enables one to prevent disease (Rogapaharana Samartham). Rasāyana keep off ageing (Jarā) and prevent disease (Vyadhi).

### **Critical Analysis of Rasāyana:**

Wide scope and application of Rasāyana may be understood by going through its merits. There are some delighting explanations which really widen the scope and thoughts about Rasāyana. One among the eight branches of Āyurveda is Rasāyana. It augments the concept and applications of Rasāyana i.e. which roots out morbidity, destructive of diseases, checks disease process, corrects the various body channels, restores the nourishing and promote the health.

Rasāyana not only alleviates or cures diseases but also maintains the intactness of body components and enhances the life expectancy.

However vigor promotive may act sometimes as curatives. Disease curatives may act sometimes as vigor promoters. Some drugs like Patha etc. by their potency cure the disease first and then further act to promote the health. Hence those are also should be considered as Rasāyana.

It is to be noted that the effect of Rasāyana extend from Rasa Dhātu to Śukra Dhātu and even up to Oja. This Oja stands as the prime media between the physical and psycho-intellectual performances.

**Action of Rasāyana drugs under the following headings**

- Immune-modulator
- Anti-oxidants
- Adaptogenic

**Rasāyana vis-à-vis Immuno-modulators**

Rasāyana contain immune-modulators of varying chemical structures and molecular sizes. These exert their effect by modulating several steps of immune system such as activation of macrophages for enhanced generation, stimulation of cytotoxic activity and Phagocytosis, proliferation of lymphocytes leading to production and also cytotoxic induction of T- helper & natural killer (NK) cells and activation of complement pathways. Immuno-stimulants offer promise in enhancing antigen specific and non-specific immune response against infection.

Rasāyana, one of the important branch of Āyurveda, relates to therapy that may help in the treatment of physical and mental or psychological diseases or improve the body's resistance effect to illness. Rasāyana Dravya's are supposed to reverse death factor by controlling the ageing process which is the primary function, secondly to have preventive and curative effect on the disease conditions.

The plants used separately or in the form of compound preparations of Rasāyana dravya's which are elaborated in the therapeutic uses of most of the chronic disorders.

Immunoglobulin A: IgA is secreting in colostrums, saliva, tears, respiratory tract and intestinal mucosa. It forms a protective coating over mucous membrane and thus behaves as an antiseptic coat.

Immunoglobulin G: IgG class of immunoglobulin contains most of the antibacterial and antiviral protective antibodies that determine immunity against infection. It provides general immunity, but it is a secondary or recall immune response. Its ability to diffuse into body tissues facilitates combination and efficient elimination of antigen. Serum IgG crosses the placenta and at birth baby possesses high amount of IgG. However, infant produces it at about seven weeks of age.

Immunoglobulin M: IgM is having ten combining sites to destroy ten antigens at a time as well as it activates compliment fixation system. IgM is the major part of the early/primary response, especially in response to non-protein bacterial antigens. It readily fixes compliment, allowing for the efficient lysis of antigen

As mentioned earlier Ashwagandha significantly increases IgA, IgM and IgG. Mandukaparni significantly increases IgG and IgM. Varahikanda, milk and Shatavari significantly increase Serum IgA and IgM. Amalaki and Guduchi significantly increase the serum IgA. The implication of these findings on each of the immunoglobulin is being discussed here under separate heading.

#### Effect of Rasāyana Drugs on Immunoglobulin A:

Ashwagandha, Shatavari, Guduchi, Amalaki and Milk caused significant increase in the serum IgA levels of the patients. As mentioned earlier hence, these drugs may be very useful in prevention of diseases of Respiratory and GI Tract. They may also be used as Naimittika Rasāyana for the disorders of these systems.

### Effect of Rasāyana Drugs on Immunoglobulin M:

Ashwagandha, Shatavari, Mandukaparni, Varahikanda, milk and Kapikacchu caused significant increase in serum IgM levels of the patients of this series.

IgM is having ten combining sites to destroy ten antigens at a time as well as it activates complement fixation system. Therefore, these drugs may be very useful as general immunity promotion drugs against the infections. It is further noticed that most of Rasāyana drugs caused increase in this immunoglobulin, which indicates the beneficial effect of these drugs in improving the general immunity.

### Effect of Rasāyana Drugs on Immunoglobulin G:

Ashwagandha and Mandukaparni increased the serum IgG. As this immunoglobulin crosses the placenta, therefore these drugs may provide passive immunity to the child during the infancy period if administered to the mother during pregnancy. However, before such use, it is desirable to evaluate the safety profile of these drugs on the fetus.

On the other hand, the drugs like Atibala, Guduchi and Kapikacchu caused slight and insignificant decrease in the serum IgG level, so such drugs can be avoid during pregnancy. However these drugs may be useful in treating the auto-immune diseases due to the immuno-suppressive action of these drugs.

### **Rasāyana vis-à-vis Antioxidants:**

#### Free radicals and antioxidants - an overview

When all the medical researchers were scratching their heads for a plausible explanation regarding ageing process, a scientist hit the headlines with his new concept in mid 50s of the twentieth century which got worldwide attraction. This is nothing but '*free radical concept*' which, today, known to be involved in the Pathophysiology of as many as eighty diseases such as arthritis, atherosclerosis, cancer, etc.

#### **Free radicals:-**

Free radicals are atoms, ions or molecules that contain an unpaired electron. Thus, they become electrically charged because number of negatively charged electron does not match with positively charged protons. When a molecule loses or gains a single electron in its outer orbit, it becomes free radical. In fact, a free radical is defined as '*a molecule that can exist independently for a period of time with one or more unpaired electrons*'. Electron imbalance causes a free radical to seize an electron from surrounding molecules to form a complete pair. The donor molecule, by giving up an electron, may itself become a radical. The chain reaction thus triggered can damage cell membranes and lead to disease.



The reaction of one free radical with another free radical will, in general, terminate the chain of free radical reactions.



Conventionally, the radicals are denoted by dot (•). Oxygen is vital for aerobic life processes. In normal health, almost 98% of oxygen used by cells to burn food is converted into water by the mitochondrial cytochrome oxidase system. Rest of the oxygen that escapes from the

cells energy engines is converted into 'reactive oxygen species' (ROS) by univalent reduction of oxygen. Oxygen is frequently referred to as a 'reactive oxygen species' based on its ability to take on electrons (reduction) or to give up electrons (oxidation). ROS include not only O<sub>2</sub> centered radicals such as super oxide (O<sup>•-2</sup>), hydroxyl (OH<sup>•-</sup>), nitric oxide radical (NO<sup>•</sup>) and peroxy radical (RO<sup>•2</sup>), but also some reactive non-radicals derived from O<sub>2</sub> such as hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), hypochlorous acid (HOCl), singlet oxygen (O<sub>2</sub>) and ozone (O<sub>3</sub>).

Thus, the cells under aerobic condition are always threatened with the insult of ROS, which however are efficiently taken care of by the highly powerful antioxidant systems of the cell without any untoward effect. When the balance between ROS production and antioxidant defense is lost, i.e., excessive production of ROS beyond the antioxidant defense capacity of the cell occurs, 'oxidative stress' sets in which through a series of events deregulates the cell physiology leading to various pathological conditions including cardiovascular dysfunction, neuro degenerative disorders, gastro-duodenal pathogenesis, metabolic dysfunction of almost all vital organs cancer and *premature ageing*.

The free radical mediated oxidative stress results in oxidation of membrane lipoproteins, Glyco oxidation and oxidation of DNA, subsequently cell death ensues. ROS from damaged cells also attack the adjacent cells, resulting ultimately in cell injury. Furthermore, cell injury itself has been reported to cause severe oxidative stresses leading to disorganization of cell structure and function<sup>37</sup>.

**Sources of free radicals (oxidants):**

There are mainly two sources viz. (1) Exogenous (ii) Endogenous.

Exogenous sources include air pollution (of which industrial waste and cigarette smoke are major contributors) radiation, drugs and pathogens. Trace metals, notably lead, Mercury, Iron and Copper are also major sources of free radical generation. Normal diets containing plant foods with large quantities of certain compounds such as phenols and even caffeine may contribute to the exogenous supply of oxidants to the body. Endogenous free radicals are produced in the body by different mechanisms.

First from is the normal metabolism of oxygen requiring nutrients. Mitochondria - the intracellular powerhouses which produce the universal energy molecule, adenosine Triphosphate (ATP) normally consume oxygen in this process and convert it to water. However, unwanted byproducts such as the super oxide anion, hydrogen peroxide and the hydroxyl radical are inevitably produced, due to incomplete reduction of the oxygen molecule. It has been estimated that more than 20 billion molecules of oxidants per day are produced by each cell during normal metabolism.

Second, white blood cells destroy parasites, bacteria and viruses by using oxidants such as nitric oxide, super oxide and hydrogen peroxide. Consequently, chronic infections result in prolonged phagocytic activity and increased exposure of body tissues to the oxidants.

Third, other cellular components called peroxisomes produce hydrogen peroxide as a byproduct of the degradation of fatty acids and other molecules. In contrast to the mitochondria which oxidize fatty acids to produce ATP and water, peroxisomes oxidize fatty acids to produce heat and hydrogen peroxide. The peroxide is then degraded by an enzymatic antioxidant called catalase.

Finally, an enzyme in the cells called Cytochrome P<sub>450</sub> is one of the body's primary defenses against toxic chemical ingested with food. However, the induction of these enzymes to prevent damage by toxic foreign chemicals like drugs and pesticides also results in the production of oxidant byproducts.

### **Free radicals and cell damage**

Reactive oxygen species can attack vital cell components like polyunsaturated fatty acids (PUFA), proteins, and nucleic acids. To a lesser extent, carbohydrates are also the targets of ROS. These reactions can alter intrinsic membrane properties like fluidity, ion transport, loss of enzyme activity, protein cross linking, inhibition of protein synthesis, DNA damage; ultimately resulting in cell death. Some of the well-known consequences of generation of the free radicals *in vivo* are. DNA strand scission, nucleic acid base modification, and protein oxidation and lipid peroxidation.

### **Lipid peroxidation:**

Free radicals in the presence of oxygen may cause peroxidation of lipids within plasma and organellar membranes. This can lead to a self-perpetuating process since peroxy radicals are both reaction initiators as well as the products of lipid peroxidation. Lipid peroxy radicals react with other lipids, proteins and nucleic acids, propagating thereby the transfer of electrons and bringing about the oxidation of substrates.

### **Free radicals and DNA**

ROS can cause oxidative damages to DNA, both nuclear and mitochondrial. The nature of damage include mainly base modification, deoxyribose oxidation, strand breakage and DNA protein cross links.

**Oxidative damage of proteins:**

During mitochondrial electron transport chain, free radicals are produced which can stimulate protein degradation. Oxidative protein damage may be brought by metabolic processes which degrade a damaged protein to promote synthesis of a new protein<sup>37</sup>.

**Antioxidant defense mechanism:**

Everyday approximately 20 million molecules of free radicals are produced. If these free radicals attack altogether, then living organism fails to exist. Each cell protects itself from damage by producing free radical scavengers such as enzymes that neutralize free radical. Thus, balance is maintained between free radical production and scavenging activity of enzymes. This is known as Antioxidant defense system.

Antioxidants are defined as '*substances whose presence in relatively low concentrations significantly inhibits the rate of oxidation of targets*'. Being present in serum, these antioxidants circumvent the damage caused by oxygen free radical. They consist of substances that provide the much needed stability to the free radical by allowing the pairing of electrons. Thus, they counteract the free radical attack.

**Types of antioxidant activity:**

It may be accomplished by three different mechanisms:

- 1) By inhibiting the generation of ROS.
- 2) By directly scavenging the free radicals by means of anti radical scavenging  
Enzymes such as SOD, catalase and glutathione peroxidase.
- 3) By raising endogenous antioxidant defenses i.e. unregulated expressions of the genes encodes the enzymes SOD, catalase or GSH – Px. This antioxidant defense system is basically of two types.

- (i) Primary defense
- (ii) Secondary defense

(I) Primary defense:

This is again subdivided into two types

- (a) Antioxidant nutrients
- (b) Antioxidant scavenging enzymes

- *Antioxidant nutrients:* Antioxidant defenses rarely on vitamins and minerals from the diet. These include beta carotene (precursor of Vit. A), Vitamin E ( $\alpha$ -tocopherol), vitamin C (ascorbic acid), selenium, zinc, manganese and copper.
- *Antioxidant scavenging enzymes:* Super oxide dismutase (SOD), catalase and peroxidase form defence system against ROS. While SOD lowers the steady state level of  $O_2$ , catalase and peroxidase do the same for  $H_2O_2$ .

(a) *Superoxide dismutase (SOD):* The first enzyme involved in the antioxidant defence. It is a metalloprotein found in both prokaryotic and eukaryotic cells.

(b) *Glutathione peroxidase:* It catalyses the reaction of hydro peroxides with reduced glutathione (GSH) to form glutathione disulphide (GSSG) and the reduction product of the hydro peroxide. This enzyme is specific for its hydrogen donor,

(II) Secondary Defense:

In addition to the primary defense against ROS by antioxidant enzymes, secondary defense against ROS is also offered by small molecules which react with radicals to produce another radical compound, the 'scavengers'. When these scavengers produce a lesser harmful radical species, they are called 'antioxidants'

Since ROS mediated oxidative stress is now regarded as the major factor causing ageing and age related neuro-degenerative diseases, suitable antioxidant therapies to control these processes have already attracted worldwide attention in recent years. The pineal hormone, melatonin, having potent antioxidant activity is a potentially promising candidate for the control of ageing and other ROS mediated pathogenesis<sup>37</sup>.

Restricting the caloric intake has also been shown to delay ageing through (i) decreased production of mitochondrial O<sub>2</sub> and H<sub>2</sub>O<sub>2</sub> and (ii) increased production of antioxidant defenses, leading thereby to decreased production of oxidatively damaged proteins, lipids and DNA. Caloric restriction may thus decrease the oxidative stress and damage and may prolong life in humans.

Isolation of an antioxidant factor which is specific in its action, is nontoxic, and shows anti stress property, from the natural sources such as plants and the therapeutic application of such an antioxidant factor would perhaps be one of the better approaches to control the ROS mediated pathogenesis<sup>37</sup>.

### **RASĀYANA VIS-A-VIS ADAPTOGENS**

Majority of Rasāyana drugs were proved to have immunomodulatory property, anabolic effect and antioxidant properties. Recent advancement in the medical science is pointing toward another activity of such drugs and these are called adaptogenic property.

#### ***Adaptogens***

The concept of 'Adaptogens' was coined in 1947 by a Russian Scientist, Lazarev. He defined them as "*substances meant to put the organism into a state of non-specific heightened resistance in order to resist stresses and adapt to extraordinary challenges*".

In general, Adaptogens are a group of medically effective substances that normalize body functions, strengthen systems and functions compromised by stress and have a protective effect against a wide variety of environmental and emotional stresses. General Adaptive Syndrome (GAS), formulated by Selye is a consistent, nonspecific response of the organism to stressful influences of totally diverse types, the adaptive reaction enables the body to heighten its power or resistance towards stresses, and to adapt to external conditions. Though difficult to differentiate adaptogenic effect from other remedies of related action, there are number of criteria which allow a formal arrangement of these other drugs in immunostimulants, nootropics, anabolic, tonics and geriatric acids. Rasāyana is certainly having any one or more of these activities. *Immune stimulants* are substances which bring about a heightened resistance through the stimulation of nonspecific defensive processes which are largely independent of antigens. *Nootropics (cognition enhances)* are effective psychopharmacological agents which are said to improve the higher integrative brain functions, such as memory, learning, understanding, thinking and the capacity for concentration. No specific mechanisms are known. It is assumed that nootropics stimulate existing neural synapses to optimum performance (adaptive capacity) and also for damaging influences, such as disturbances of the energy and neurotransmitter metabolism or ischemia (protective capacity). *Anabolics* are substances which activate the anabolic metabolism. They promote the synthesis of nucleic acids and protein metabolism, thereby in general, growth. Tonics and geriatric remedies fall into the category of wellness enhances. Though a precise conceptual definition cannot be given for both, *tonics* are defined in a much generalized way as substances which mitigate conditions of weakness or lack of tone within the entire organism, or in particular organs. Being adaptogenic, like all the others, generally, adaptogens raise one's capacity, therefore may also be included by the group of tonics<sup>38</sup>.

*Geriatric remedies* are substances serving as a preventive treatment of old age diseases. Stiffness and age conditioned rigidity are possibly the outer manifestations of diminished or lacking ability to adapt.

Brekhman, in 1958, summarized the concept Adaptogens as follows:

- It must show a nonspecific effect (raising the power of resistance to toxins of a physical, chemical or biological nature).
- It is to normalize, independent of the type of pathological condition.
- It must be harmless and disturb the body functions as little as possible.

Accordingly, adaptogens are to strengthen the nonspecific powers of resistance to noninfectious stresses, raise the general performance capacity during stress situations and thereby prevent diseases that could develop due to over stress in the organism. It is seen as characteristic of adaptogens that their anti-stress effect towards stresses of a noninfectious variety, always stands in the foreground. Although in so-called adaptogens, immune stimulating, nootropic or metabolic effects have also been proved<sup>38</sup>.

By going through the aforesaid pages, it is certain that adaptogens show the similar qualities of Rasāyana i.e., Dhātuvrddhikara, Medhya, Pustikara, Balada, Dehendriya Drdhikarana, Brmhaniya, Jivaniya, etc. and thus help improve body's defense system.

### **Pharmacology and Clinical Usefulness of Adaptogens<sup>39</sup>**

The term "adaptogens" is used to discuss a group of plants that have the ability to increase nonspecific resistance of the body to a wide range of chemical, physical, psychological and biological factors (stressors). The definition of an adaptogen was first proposed by Soviet scientists in the late 1950s — namely that an adaptogen is any substance that exerts effects on both sick and healthy individuals by "correcting" any dysfunction(s) without producing unwanted side effects. Adaptogens have the unique ability to switch from stimulating to sedating effects based on the body's needs.

Adaptogens may also help the body increase physical performance and enhance mental function. Some examples of commonly used plants having adaptogenic activity include:

- Rhodiola,
- Arctic root,
- Golden root (*Rhodiola rosea* L., Crassulaceae),
- Ashwagandha (*Withania somnifera* (L.) Dunal, Solanaceae)

The mechanism by which adaptogens work is associated with the stress-system (a function of the neuroendocrine/immune complex). Adaptogens affect the hypothalamus-hypophysis-adrenal cortex axis of the endocrine system, as well as the immune system and the central and sympathetic nervous systems. There are biochemical activators of the stress response (nitric oxide, catecholamines such as epinephrine and dopamine, and the inflammatory mediators termed leukotrienes, among others) and inhibitors of the stress response (corticosteroids, prostaglandin E2 or PGE2). There should be equilibrium among these biochemical in order for the organism to achieve what is termed homeostasis, or balance of all body systems and functions. Studies of the pharmacology of various Adaptogens in laboratory animals have revealed an increase in physical working capacity along with the stress-

*Evaluation Of The Rasāyana Effect Of Kruṣṇa Tila (Semen Sesami Nigrum)-A Clinical Study*

protective effects to a variety of potentially harmful factors including heat, skin burn, frostbite, irradiation, and heavy metal toxicity, among others. Adaptogens also have antioxidant activity and may be helpful in cardiovascular diseases, diabetes, various psychiatric conditions such as alcoholism and drug dependence, schizophrenia, and other neurological disorders. Adaptogens are useful agents and may offer some positive benefits as a general tonic for improved stamina and overall health, especially for stressful conditions, fatigue, concentration.<sup>39</sup>

All the above mentioned points can be summarized as below:

Rasāyana contains immune-modulators of varying chemical structures and molecular sizes. These exert their effects by modulating several steps of immune system such as activation of macrophages for enhanced generation, stimulation of Phagocytosis, proliferation of lymphocytes leading to production of t helper cells and activation of complement pathways. Immuno-stimulants offer promise in enhancing antigen specific and nonspecific immune response against infection. Reservoirs of Balance and Intelligence

### **Rasāyana: Packets of intelligence<sup>40</sup>**

Ayurvedic herbal or mineral preparations used for promoting general health, immunity, strength, vitality virility and spiritual attainment are known as *Rasāyana*. These preparations are held to be mediators of balance and intelligence, a concept that explains their biological actions. The concept of biological information in modern science, for example as coded in DNA, has a counterpart in Āyurveda.

### **The principle of complementarities**

Veda is the most ancient literature's available-for the cosmos, including plants and animals. Out of this rises an important consequence: the principle of complementarities in Āyurveda explains that the sequence

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of biological information as stored in plants and minerals corresponds to the sequence of biological information in the human physiology. Rasāyana therapy utilizes this principle of complementarity to eliminate distortions and restore integrity to the flow of biological information and intelligence in the human physiology. Rasāyana function like small "tuning forks" that impart the proper resonant frequency and thus restore balance to the system. To use another analogy, Rasāyana can be seen as small packets of "software" that supply an essential program to restore integrity to the source code. Pharmacologists have identified sites on cell membranes, called receptors, to which small molecules, called ligands, such as hormones, neurotransmitters, and peptides can bind. Each molecule has a specific conformation and functions like a small key, fitting into the receptor site and activating another enzymatic reaction to produce its effect. It is widely held that many drugs and herbs act by fitting into the receptor site of naturally occurring hormones or neurotransmitters (called endogenous ligands), thus either inhibiting or mimicking their effects<sup>40</sup>.

### **Balance: the basis of stability**

When biological information is highly orderly and integrated, according to Āyurveda, the result is physiological "balance"--a state in which the parts of the organism are functioning in an integrated and harmonious state of equilibrium, rendering the organism as a whole both flexible and stable.

### **Rasāyanas: agents with multiple biological effects**

The results of research on Rasāyana confirm that Rasāyana have clinical effects on multiple disorders, suggesting that they act by strengthening the immune system and restoring balance in the physiology. This reaffirms the importance of using the whole plant in accordance with the descriptions of the classical Ayurvedic texts to

produce a balanced effect in the whole physiology. In contrast to this comprehensive approach of Āyurveda, modern science focuses its attention on identifying the "active ingredient," which frequently acts on an isolated aspect of the physiology and therefore often produces unwanted side effects. Research on Ayurvedic preparations has shown that traditional formulations often contain dozens of active receptor sites (e.g. the research on MAK4). The presence of such a wide variety of ligands suggests that the preparation may be acting on a wide variety of tissues through a number of different mechanisms.

This finding is not unexpected. Every plant contains thousands of various alkaloids, steroids, flavinoids, terpinoids and other molecules with bioactivity, and Āyurveda preparations may consist of many different plants. In addition, Āyurveda usually uses the entire part of the plant, for example, the whole fruit or leaf, and not just one constituent. It is therefore easy to see how Ayurvedic preparations such as MAK4 may contain many ligands<sup>40</sup>.

### **Nature: the most subtle resource**

The presence of many naturally occurring ligands in one preparation suggests that the preparations are balanced in the sense described above. In the case of Ayurvedic Rasāyana, this balancing is carried out by nature. To a botanical pharmacologist or phytochemist, the finding of such a wide variety of ligands to mammalian cell membrane receptors, which suggests an intimate relationship between plants and mammal neurochemistry, is indicative of the elegance, beauty, and harmony in nature<sup>40</sup>.

## AGEING (JARĀ)

Ageing is a complex phenomenon. Ageing is defined as a process that results in age-related rise in the death rate or failure rate.

Biologically ageing can be defined as the addition of complete changes that occur in the living organism with the time which leads to a decreased ability to tolerate day to day activities, functional disturbances and ultimately ending in to death. The most common Aging theories include Mutation, Accumulation and Antagonistic Pleiotropic theory, the two theories presume that aging is due to pleiotropic genes with beneficial early-life effects but deleterious late-life effects (antagonistic pleiotropic) or mutations with purely deleterious late-life effects (mutation accumulation). The aging of the world's population has major implications for medical care and health care systems. According to the United Nations, the number of people worldwide aged 60 years or older will increase from 1 in 10 currently to 1 in 5 by 2050. By 2050, the ratio of people aged 65 years or older to those aged 15–64 years will double in developed nations and triple in developing nations. This demographic shift compels us to deal with the changes associated with aging and the various anti-aging therapies<sup>41</sup>.

Aging is known as “Jarā” in views of Ayurvedic science. Aging or Jarā is defined as that which has become old by the act of wearing out “jīryati iti jarā”. “Vārdhakya” used as synonym of Jarā means increasing age<sup>50</sup>. The term *Jarā* is derived from the Sanskrit root “Jras vayohanau” state by Panini, which means loss in time of life span or shortening of life. The final stage of life has been considered to be as *Jarā*.

Āyurveda classifies stages of human life as —childhood (up to the age 16 years); youth and middle age [from 16 to 60 years (As per Charak) or 70 years (As per Suśruta) which is further divided into progressively the traits of growth (vivardhamana, 16–20 years of age), youth (youvana, 20–30 years), maturity (sampoornata, 30–40 years), deterioration (parihani, 40 years onwards) which gradually continues up to 60 years]; and lastly the old age, wherein after 60–70 years the body elements, sense organs, strength, etc. starts to decay<sup>51</sup>. Charak Ācārya mentions that the growth of an individual occurs up to 30 years after which it stops and process of ageing is initiated.

The word Prakriti has been devoted to the nature of an individual varies according to Desha, Kala, Prakriti and heredity and accordingly ageing may appear early, timely or late with less, moderate or more symptoms.

Suśruta Ācārya highlights list of naturally occurring diseases which are termed as Swabhavaja Roga's, like Kshuta, Pipasa, Nidrā, Jarā and Mrityu i.e. death. Suśruta Ācārya divides Swabhavaja Vyadhi's in two group's viz. Kalaja (occurring due to influence of time or natural) and second is Akalaja (unnatural). Based on this Jarā can be understood in two ways i.e. Kalaja Jarā and Akalaja Jarā.

### Natural aging

The Jarā appearing at or after the proper age defined for it. That means one person getting old age, after sixty or Seventy years is known as Kalaj Jarā. This type of Jarā is Pariraksanakrita, which means that it occurs at the proper age, after following the seasonal and daily routine described in Swasthavritta and use of Shodhana at proper time. This aging may be of less intensity and slow progressing and thus may not be very troublesome.

### Unnatural aging

When the signs and symptoms of Jarā are present before its prescribed time it is called as Akalaja Jarā. This type of Jarā is said to be due to Aparirakshanakrita, which means that it occurs before the prescribed age due to not taking the proper care of personal hygiene (Swasthavritta) and not getting Shodhana done at proper time. This type of ageing may be of greater intensity and rapidly progressing, if no care is taken to check it through proper treatment.

There is no medicine for Kalaja Jarā and considered as Yapya i.e. by the treatment with Rasāyana, the ill effect of ageing can be checked for some time and its progress may be slowed down or be halted to some extent. The second type i.e. Akalaja Jarā is curable and should be treated according to the Dosha and the complaints of the person.

According to Charaka the age above sixty years may be taken as old age, but Suśruta increases this limit to seventy years. This difference of Charaka and Suśruta may be due to the reason that every phenomenon has got its starting point at which it may not be very obvious but after some time when the phenomenon advances sufficiently its effects are clearly visible. In this way there is always a gap between the starting point and the complete manifestation of every phenomenon, which may be short and long depending upon the various conditions. For instance this gap is very short in acute poisoning and is long in the conditions like chronic poisoning (Gara Visha) etc.

In case of ageing the phenomenon generally progresses slowly and starts at the age of about sixty and its effects are quite visible at the age of seventy years. Charaka being a physician might have appreciated the changes of ageing at their starting point and therefore he has taken 60 years and above as the old age. On the other hand Suśruta might have thought it safer to take the limit of

ageing as 70 years when most of the symptoms of ageing are quite visible. Hence, premature ageing is that which occurs before the age sixty years.

Charaka has considered as by nature they are incurable or having no treatment. Chakrapani says ordinary treatment has got no effect on ageing. Rasāyana is the treatment of ageing as it has been clearly mentioned in Charaka that the old Cyavan Rishi became young after the use of Rasāyana.

Dalhanā explain that out of two types of ageing, the natural ageing is incurable and unnatural ageing can be treated with Rasāyana treatment.

Yapya is partial amenability of disease to treatments. Rather a person lives with the disorder without cure but without disturbed by the diseases if proper treatment is taken. It is said that in difficult stage, the disease recurs immediately after the treatment is withdrawn. This explanation goes in hand with the Chakrapani's commentary as noted above.

This means, a timely senescence can be manipulated with measurement by dietics and Rasāyana, so that its ill effects are controlled. Rasāyana is not the complete treatment for ageing, as it can just check or delay the process of ageing for some time, but it cannot be retarded and as soon as the effect of Rasāyana finishes the process of ageing starts again to march to the forward.

In Charaka Samhita it is stated that by using "Chyavanaprasha" in proper way and dosage Saint 'Chyavana' who was very old turned young. Further it is said that consumption of Chyavanaprasha not only eradicates the signs of old age (Jarākrita Rupa) but also superimpose the youthful appearance.

Aging in all tissues

Another question arises here about the changes in to body tissues. Aṣṭāṅga Samgraha has mentioned some view about these Phenomena. Accordingly something is being lost at the end of each decade of life, beginning from birth. At the end of first decade childhood is gone, after second decade growth is stopped, after third decade luster is lost, in the fourth decade intellect starts declining and at the end of fifth decade skin's property is lost. Similarly at the end of sixth, seventh, eighth, ninth and tenth decades of life reproductive function, Vision, hearing), Mind; Sense organs and motor organs are lost respectively.

Table 2 - Changes In Every Decade Of The Life

<b>Decade</b>	<b>Sharangdhara Samhita</b>
1 <sup>st</sup>	Childhood
2 <sup>nd</sup>	Growth
3 <sup>rd</sup>	Complexion
4 <sup>th</sup>	Memory
5 <sup>th</sup>	Skin
6 <sup>th</sup>	Vision
7 <sup>th</sup>	semen
8 <sup>th</sup>	Valour
9 <sup>th</sup>	Intellect
10 <sup>th</sup>	Motor organs
11 <sup>th</sup>	Mind
12 <sup>th</sup>	Life

Hence, it can be stated that the changes in the body tissues are slow and continuous during whole life. The process of Aging according the Āyurveda begins at the fourth decade of life and the effect of Aging is more visible at the fifth decade of life where the skin changes are visible. And slowly this process affects to the other organs of the body.

**Table 3 - Signs of Ageing<sup>42</sup>**

Signs and symptoms	Charak	Suśruta	Ashtang sangraha	Ashtang hridaya	Madhav nidana
Dhatu kshaya	+	+	+	+	-
Indriya kshaya	+	+	+	+	-
Bala kshaya	+	+	+	-	+
Veerya kshaya	+	+	+	-	-
Utsaha kshaya	-	+	+	-	-
Oja hani	-	-	-	+	+
Vali	-	+	+	+	-
Palita	-	+	+	+	-
khalitya	-	+	+	+	-
Paurusha hani	+	-	-	-	
Parakrama hani	+	-	-	-	+
Grahana dharana smaran hani	+	-	-	-	+
Vigyana hani	+	-	-	-	-
Vachana hani	-	-	-	-	-
Dhatu guna kshaya	+	-	-	+	-
Alparetas	+	-	-	-	-
Agni sada	-	-	+	-	+
Kasa	-	+	-	+	+
Svasa	-	+	+	-	+
Vaipathu	-	-	+	-	+
Slatha sara	-	-	+	-	-
Slatha mamsa	-	-	+	-	-
Prabha hani	-	-	+	-	-
Medha hani	-	-	+	-	+
Twak parushya	-	-	+	-	-
Chinta	-	-	-	-	+

Signs and symptoms	Charak	Suśruta	Ashtang sangraha	Ashtang hridaya	Madhav nidana
Krishta	–	–	–	–	+
Krodha bahulya	–	–	–	–	+
Kapha vridhicha gale nirantaram	–	–	–	–	+
Saktih, nisthivaneh sah nirgamo	–	–	–	–	+
Hasta-pada- kampa jiwha kampa	–	–	–	–	+
Vepathu	–	–	–	–	+
Murdha –skhalana	–	–	–	–	+
Pada-dvaya skhalana	–	–	–	–	+
Dhanurvata	–	–	–	–	+
Dehasyachtinamanam	–	–	–	–	+
Buddhi balyam jayeta	–	–	–	–	+
Prakritoatikharata	–	–	–	–	+
Vataamaya	–	–	–	–	+
Swalpa-shakti-avashishyat kleshma	–	–	–	–	+
Ativismanti	–	–	–	–	+
Dandashrayen – Gaman	–	–	–	–	+
Rad hinta-aassye	–	–	–	–	+

Jarā (ageing) is a naturally occurring disease. Charaka Ācārya explains as by nature Jarā is incurable or having no treatment. Chakrapani commenting on Charaka explains that ordinary treatment has no effect on ageing but Rasāyana is the means of controlling the ageing as in Charaka saṁhitā there's reference of the old Cyavan Rishi who became young after the use of Rasāyana.

Dalhanā, Commenting on Suśruta Samhita explains that, Kalaja Jarā is incurable whereas the Akalaja Jarā can be treated with Rasāyana treatment.