

A CONCEPTUAL STUDY OF RASAYANA IN POST RADIOTHERAPY

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ABSTRACT

The most horrifying condition to ever plague humanity is cancer. The currently accessible treatments such as chemotherapy and radiotherapy, have cytotoxic effects on the patient's healthy cells which results in many adverse effects. Additionally, this leads to certain complications in therapy, health problems, and a decline in quality of life, which forces a treatment interruption. In the current study beneficial effects of *Rasayana* therapy and Ayurvedic formulation, has been cited to see if it may be used as an adjuvant therapy to chemotherapy and radiotherapy. Radiotherapy and chemotherapy affects healthy cells along with diseased cells and produces ill effects on body as well as psychology of patients. *Rasayana* can have rejuvenating effect on cells and can maintain patients Oja and Bala improving his quality of life.

KEYWORDS: *Rasayana*, radiotherapy, cancer, rejuvenation, *Ayurveda*.

INTRODUCTION

A long and healthy life has been cherished by man since antiquity. Ayurveda is the science of life through which a prolonged happy and healthy life can be attained. This ancient holistic science has a dwell motto of maintaining the health of a healthy person and alleviates disorders of diseased.^[1]

This two main aim of ayurveda can be very well furnished through ‘*Rasayana*’ -an unique branch of *Astanga Ayurveda*. *Rasayana* therapy's primary goals is to maintain health of healthy and to treat disease in sick people. *Rasayana* enhances the body's metabolic processes by working at the cellular level. Main goal of *Rasayana* Therapy are preservation and promotion of health of healthy individual, maintain equilibrium of *Dhatu*s, management of disease, prevent premature ageing and provide longevity, enhance immunity, invigorate the system.^[2]

This therapy is key specialisation in *Ayurvedic* medicine, it is not only a single pharmacological treatment but also a specialised therapeutic procedure. *Rasayana* medications increase youth, memory, intelligence, complexion, body shine, and greatest physical strength when used properly and at the right time. *Rasa-Dhatu*, *Agni*, and *Srotas* are three different levels on which *Rasayana Dravyas* functions.

RASAYANA- REJUVENATION, HEALING, & REGENERATION

Rasa + Ayana = Rasayana

It essentially means the nutrition at microcellular level. *Rasayana* helps in attaining replenished and excellent *Dhatu*s and *Ojas*. *Deerghayu*, *Smriti*, *Medha*, *Arogyam*, *Tarunam Vaya*, *Prabha*, *Varna*, *Swararodarya*, *Indriya Balam*, *Vaksidhi*, *Pranati*, *Kanti* are the foremost benefits of *Rasayana* therapy.^[3]

Everyone aspires to appear young forever and lengthen their lives by maintaining good health. However, as people age, numerous body parts and cells undergo changes. For better synchronization between the body, mind, and soul, it is vital to rejuvenate the body systems time to time. *Rasayana* accomplish the same thing. *Rasayana* also refers to rejuvenation therapy. It is one among eight *Ayurvedic* disciplines, referred to as *Jara Chikitsa*, that attempts to promote a long and healthy life. Rather than only treating ailments, *Ayurveda* promotes excellent health. *Rasayana* is a proactive move in that direction. *Rasayana* proclaims that it slows down the ageing process.^[4] In essence, it increases the *Oja* (vital energy of life) and immune system. The majority of these *Rasayana* can be consumed frequently as food to maintain both good physical and mental health. They can be utilized as an adjuvant alone or in combination with other forms of therapy.

Rasa refers to fluid or juice and *Ayana* means pathway. Additionally, *Rasayana* refers to the process by which one obtains the best quality of *Rasa*.^[5] *Rasayana* is the best way to nourish the *Dhatus*. *Acharya Sushruta* postulated *Rasayana* as a chemical that slows down the ageing process, lengthens life expectancy, boosts mental and physical stamina, and stops the spread of disease.^[6]

According to *Acharya Charak*, the substance which revitalize health of a person by creating the finest quality of *Rasa*, *Rakta Dhatu* and other *Dhatus* are called as *Rasayana*. According to *Ayurveda*, rejuvenation occurs so that a person can remain healthy and explore the spiritual aspect of life.

CLASSIFICATION OF RASAYANA

There are various classifications for *Rasayana* therapy.^[7] Some of them are as follows.

1. On the basis of use

- a. ***Kamya Rasayana*** - *Kama* means desire. The *Rasayana* used to achieve a wish or desire or to serve a special purpose is known as *Kamya Rasayana*. It is also used to promote general physical & mental health.

It is of three types.

- a) *Prana kamya Rasayana* – It is used for accomplishing or sustaining the best quality of *Prana* (life energy) in the body.
- b) *Medha kamya Rasayana* - It is used for improving the memory and intellect.
- c) *Srikamya Rasayana* - Promoter of complexion
- b. ***Naimittika Rasayana*** – *Naimittika Rasayana* is given to combat or balance a specific cause of a disease in the body. Few examples of this *Rasayana* are *Dhatri Rasayana*, *Mandookaparni Rasayana*, *Brahmi Rasayana* and *Triphala Rasayana*.

2. As per method of use

- a. ***Kuti-praveshika Rasayana*** – *Kuti* means cottage and *Praveshika* means to enter. In this *Rasayana* therapy the individual reside inside a specially prepared cottage until administration of *Rasayana*.
- b. ***Vatatapika Rasayana*** – This can be administered even if the individual is exposed to the wind and the sun. It is also called as Open air therapy or Out - door therapy.

3. As per contents of *Rasayana*

- a. *Aushadha Rasayana* - Based on drugs and herbs.
- b. *Ahara Rasayana* - Based on diet and nutrition.
- c. *Achara Rasayana* - Based on conduct and behaviour.

BENEFITS OF RASAYANA THERAPY

According to *Acharya Charak*, the benefits of *Rasayana* therapy are as follows^[8,9]

1. It improves the intellect, memory, will power, immunity, skin lustre, melodiousness of voice and physical strength.
2. It nourishes the *Rakta*, *Rasa*, *Mamsa*, *Majja* and *Shukra* and thus prevents chronic degenerative changes and illness. It provides relief from chronic degenerative disorders like Arthritis and senile diseases.
3. *Rasayana* is believed to enhance metabolic processes, which results in the best possible biotransformation and produces best quality dhatu which restricts diseases of old age.
4. Aids to achieve optimal physical strength and perceptiveness of sense organs.
5. *Rasayana* has noticeable action on reproductive organs and also nurtures *Shukra dhatu*.
6. *Rasayana* improves natural resistance against infection by increasing Immunity power.
7. *Rasayana* sustains and maintains the balance between anabolism and catabolism.
8. It standardizes the circulation of vital fluid and eradicates the waste materials, invigorate the nervous system and keep vigour and stamina.
9. Prevents wasting of muscles, delays the ageing process, keeps strong bones, tendons etc. Thus, prevents osteoporosis.
10. Improves circulation in body, prevents greying of hair and provides good sleep and

CONTRAINDICATION OF RASAYANA THERAPY

It is contraindicated in person with following insufficiencies, self-indulgence, laziness, poverty, triflers of medicine. The above seven types of persons are unfit to take *Rasayana* drugs on account of their respective ignorance, inactivity, poverty, vacillations, intemperance and inability to secure the genuine medicine.^[10]

RADIOTHERAPY

Cancer is the second most non- communicable disease reported after heart diseases. Cancer has been a challenge for medical experts since a long time due to its dreadfulness and also adverse effects of treatments available. New treatment modalities and hundred of medications are now researched for cancer.

Conventional management of cancer encompasses

- ❖ Surgery
- ❖ Radiotherapy [including Hormone therapy and molecular targeted therapy]
- ❖ Chemotherapy
- ❖ Immunotherapy and gene therapy

Radiation therapy (RT) is an important component of a comprehensive cancer treatment program, which contribute to treat 50% of all cancer cases with or without surgery and chemotherapy. Every year, about 14 million new cases of cancer are diagnosed globally; radiation therapy (RT) has the potential to improve the rates of cure in 3.5 million cases and to provide palliative relief for another 3.5 million people. This conservative

estimate is based on the fact that approximately 50 percent of all cancer patients can benefit from RT in the management of their disease (Barton, Frommer et al. 2006; Tyldesley, Delaney et al. 2011; Barton, Jacob et al. 2014) with approximately half of these patients presenting early enough to pursue curative intent.^[10]

In Today's era, radiotherapy is a crucial and integral part of any successful cancer treatment plan, all over the world and irrespective of one's financial situation. RT is used to treat localized as well as advanced or disseminated cancers. It provide local control (wide-ranging response with no recurrence in the treated area) or symptom relief in advanced cases (Gunderson and Tepper 2012). It is frequently used in combination with surgery, either preoperatively or postoperatively, or in combination with systemic chemotherapy before, during, or subsequent to the course of RT (Barton, Jacob et al. 2014).

The subjective appraisal of physical, mental, and social well being of a patient is mandatory for health related quality of life. Quality of life outcomes are also key goals of contemporary cancer management. Radiation therapy mainly affects cells of skin, oropharynx, mucosa, small intestine, rectum, bladder, vaginal mucosa. The authorities consider anorexia- cachexia syndrome to be one of the primary cause of death in patients with cancer. Psychological factors may result in anorexia, diarrhoea, nausea, vomiting and mucocitis. It may also lead to necrosis, fibrosis, fistula formation, non- healing ulcers and damage to specific organs in later phase.^[12]

Repair, redistribution, repopulation and reoxygenation are the 4 'R' that define effectiveness of the radiotherapy. The controlled use of radiotherapy affects both healthy and malignant tissues. The biological efficacy of radiation depends on factors like quality of radiation, dose, dose rate, oxygen presence or absence. Even after using all the precautions and control events radiotherapy frequently results in damage to normal cells. It is visible in the form of adverse reactions which are classified under three classes on the basis of result. Severe morbidity or even death may occur in severe cases, due to over exposure. Degradation of quality of life may result from class II radiation. Mild, transient and reversible reactions result from Class III radiation. After radiotherapy adverse reactions like nausea, vomiting, skin reaction, mucositis and fatigue occur. While xerostomia, tastelessness, oedema and damage may appear from chronic long terms effect.

Because radiation affects both normal tissues and tumours, achieving an acceptable therapeutic ratio defined as the probability of tumour control versus probability of unacceptable toxicity— requires the radiation dose (in units of Gy, for example, J/kg) to be delivered within very tightly controlled tolerances with less than 5 percent deviation.

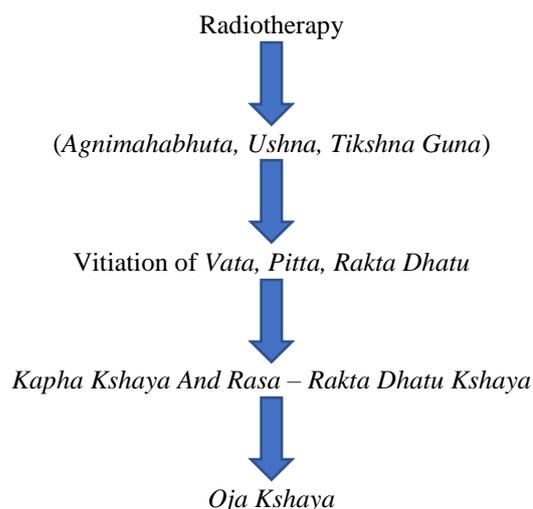
LIMITATIONS OF RADIOTHERAPY

- ⊙ Radiotherapy frequently causes damage to the normal cells, which is evident in the form of adverse reactions.
- ⊙ As several rounds of treatment are often dispensed over a period of time, the patient can develop psychological disturbances in anticipation of subsequent rounds.
- ⊙ Although many of these conditions subside once the therapy is over; the long-term effects force the patients to discontinue treatments and leave the person in a deeply weakened state with low quality of life.
- ⊙ Due to the failures of most of the radio protectors and chemo protectors in controlling the side effects of conventional cancer therapy completely, a complementary and alternative system of medicines have attracted the view of medical practitioners.

PROBABLE CORRELATION WITH AYURVEDA CONCEPT

AYURVEDIC PATHOLOGY OF RADIOTHERAPY EFFECTS

The radiotherapy can be corelated with *Tejas Mahabhuta Chikitsa*, in which modified form of *Agni* is used. The *Ushna*, *Tikshna* and *Ruksha Guna* of *Agni Mahabhuta* perform the functions listed against radiotherapy. Due to these *Guna* Vitiation of *Pitta*, *Vata* and *Rakta* occurs which ultimately leads to decrement of *Kapha* and *Oja Kshaya* is observed in such patients. The patient loses his own *Bala* to protect himself against harmful effects of radiotherapy. The *Ushna*, *Tikshna*, *Rukshna Guna* may cause *Vata- Pitta Vriddhi* and *Kapha Kshaya* along with *Rasa* and *Rakta Kshaya*. It also produces *Visha* like symptoms in body leading to *Oja Kshaya* and *Dhatu Paka*.



RESTORATION OF DEPLETED OJA

Acharya Sushruta has mentioned *Oja* as the *Sara* of all *Dhatu*s and *Bala* of body.^[13] To regain strength after radiotherapy it is needed for patients to restore their *Ojas*. In *Ayurveda* treatment of *Agnidagdha*, *Dhatupaka* and *Visha Chikitsa* are mentioned with scattered

references. Use of *Vata Pitta Shamaka*, *Kapha -Oja Vardhak* and *Rasa Rakta Prasadaka* medication can improve *Bala* and *Oja* in patients after radiotherapy.

Along with this, the drugs having *Balya*, *Brimhana*, *Shramahara* and *Jeevaniya* properties will also be beneficial.

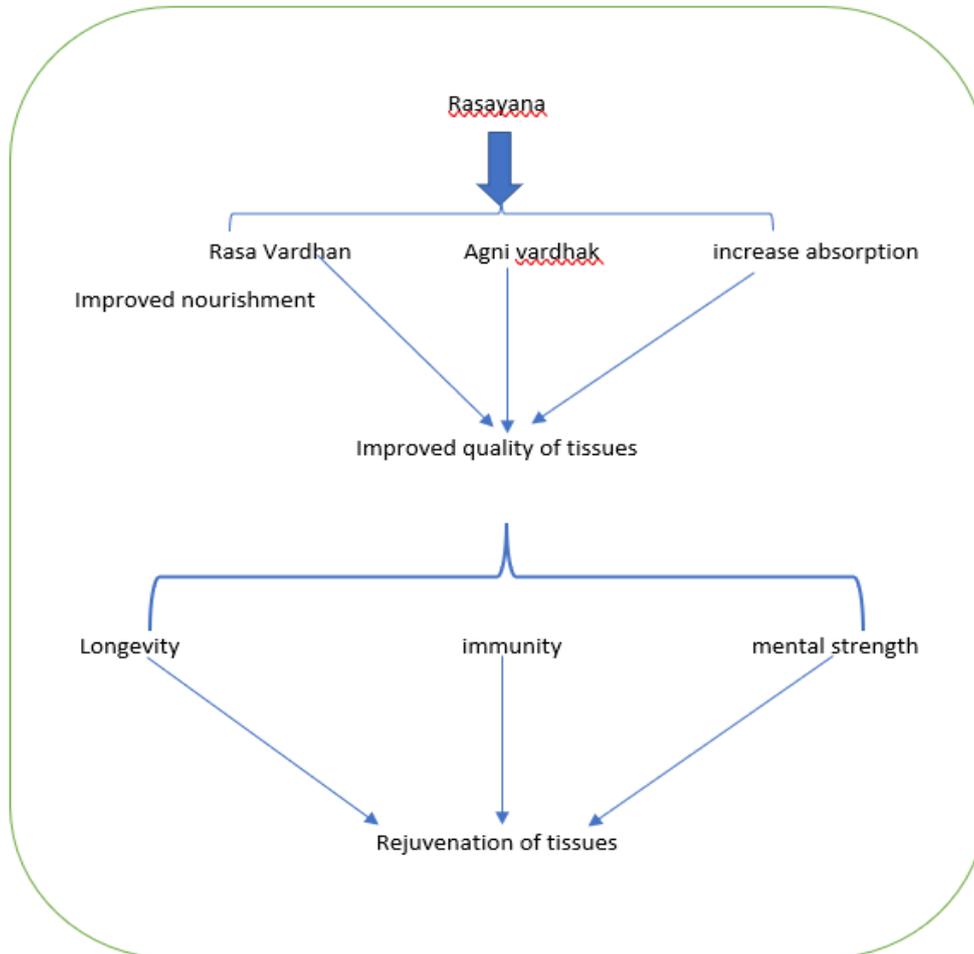


Figure no. 1- Mode of action of Rasayana Dravya in restoring Oja.

THE ROLE OF RASAYANA

Rasayana therapy can prove very beneficial in the post management of after effects of radiotherapy in cancer patients. It has multidimensional effects such as.

Multidimensional

- Prophylatic
- Palliative
- Curative
- Supportive

- As an adjuvant or co-therapy along with chemotherapy and radiotherapy.
- Anti-oxidant activity of *Rasayana* drug helps to reduce generation of oxidative stress induced aldehydes.
- Adaptogenic activities of *Rasayana* herbs and formulas.
- Enrichment of the *Rasa* which is concerned with the Conservation, transformation and revitalization of energy.
- Cell protective activity of polyherbal and herbo mineral drugs.

Some promising Drugs and Formulations for Rasayana

- *Chyavanaprasha avaleha*
- *Triphala Rasayana*
- *Amalaki Rasayana*
- *Pippali Rasayana*
- *Loha Rasayana*
- *Haritaki Rasayana*
- *Vidanga Rasayana*
- *Shilajitu Rasayana*
- *Brahma Rasayana*
- *Rasayana avaleha*
- *Guduchi*
- *Ashwagandha*
- *Mandookaparni*
- *Tulasi*

Table no 1: Showing Ayurvedic remedy for side effect of Radiotherapy.

S. No.	Side effects of chemotherapy radiations	Classical Ayurvedic remedy
1.	Mucositis	<i>Khadiradi vati</i> -for chewing <i>Kala churna</i> - Mouth gargles ^[14]
2.	Nausea and Vomiting	Powder of <i>Haritaki</i> with honey, <i>Khandkushmand Avaleha</i> , <i>Eladi Churna</i> , <i>Kalyanaka ghritha</i> , <i>Jivaniya Ghrita</i> , <i>Sutasekhara Rasa</i>
3.	Anaemia	Oleation, purgation, oral intake cow's urine, milk or Cow's urine with decoction of <i>Triphala</i> for 7 days ^[15] <i>Dhatri Avaleha</i> ^[16]
4.	Diarrhoea	<i>Pippali</i> powder with honey then butter milk with powder of <i>chitraka</i> or <i>Pippalyadi yoga</i> ^[17]
5.	Sleep problem	Whole body massage, bath, eat rice with curd or ghee or milk etc. music, comfortable bed, cuddling before sleeping. ^[18]
6.	Fatigue	<i>Ashwagandha</i> , <i>Shatavari</i> ^[19]
7.	Cognitive deficits	<i>Kalyanaka Ghrita Chayavanprash</i> ^[20]
8.	Constipation	<i>Triphala</i> with warm water and ghee (evidence based), Constipation caused by <i>Vata</i> and <i>Pitta</i> - <i>Erand Taila</i> with decoction of <i>Triphala</i> or milk or meat soup. ^[21]
9.	Pharyngitis	<i>Khadiradi Vati</i> for chewing
10.	Hepatotoxicity	<i>Panchakola Ghrita</i> <i>Rohitaka Ghrita</i> ^[22]
11.	Male Infertility	<i>Gokshuradi modaka</i>
12.	Female infertility	<i>Brahatashatavari Ghrita</i>
13.	Pain relief and tumor reduction	<i>Guggulu</i> preparations
14.	Recurrent infections	<i>Gandhaka Rasayana</i> , <i>Maha lakshmvilas rasa</i>
15.	Abdominal pain	<i>Sankha Vati</i> , <i>Amapachana Vati</i>
16.	Bleeding and epistaxis	<i>Pravala Panchamrit Vati</i> , <i>Vasa+Goats Milk</i>
17.	Headaches	<i>Navajeevana Rasa</i> , <i>Sirasooladi Vajra Rasa</i>
18.	Anorexia	<i>Lavangadi Choornam</i> , <i>Khadiradi Vati</i> .

DISCUSSION

Chemo-radiotherapy is considered an effective way to help cancer survivors but they are highly toxic and damage adjacent healthy cells resulting many adverse effects. Quality of Life of cancer survivors are worst. Through Ayurvedic perspective, it appears that side effects of radiotherapy are the manifestations of aggravated *Pittadosha*. Also it vitiates *Jatharagni*, causes *Annavaha srothodusti*. So *Rasayana* therapy and *Pittashamaka* regimen as an adjuvant to chemo-radiotherapy and post surgery care, will definitely help to minimize the adverse affect of these conventional treatments.

Probable Mode of Action

The most probable mechanism of *Rasayana Dravyas* which can be interpreted with modern aspects are antioxidant action, immune- modulatory action, hemopoetic effect, adaptogenic action, antiaging action, anabolic action, nutritive property, neuroprotective action.

Most drugs used in *Rasayana* therapy has *Madhura Rasa*, *Sheeta Virya* and *Madhura Vipaka*. Due to these properties it acts as *Vata Pitta Shamaka* and help in nourishment of depleted *Kapha* and *Rasa Rakta Dhatu*. Thus, contributing in increasing weight of body and by

Ojas Vardhan the immunity and *Bala* of patient is also increased. It also augments the *Dhatwagni* and thereby helps in filling of cellular substances with more *Dhatu Poshaka Dravyas*. The biological function of *Kapha* is to endorse the tissue building and healing of damaged tissues. *Rasayana Dravya* acts positively on vitiated *Doshas* which are mainly responsible for occurrence of adverse effects on tissues.

CONCLUSION

Rasayana is not just a drug therapy but it is a specialized procedure practiced in the form of rejuvenative recepies, dietary regimen, and special health promoting conduct and behavior. '*Rasayanas*' are rejuvenators, nutritional supplements, possess strong antioxidant activity and antagonistic actions on the oxidative stressors. Since adverse effects and drug resistance are the major obstacles for the better outcome of the conventional therapies of cancer it is needed to develop a anti malignant *Rasayana* therapy approach. So further clinical trials and experimentations by incorporating ayurvedic principles and medicines in broader aspects are needed to create a new dimension in field of mainstream cancer medicines to improve quality of life of the patients.

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