

Immunomodulation by Rasayana Therapy

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Abstract: The word “Immunity” refers to the body’s ability to prevent the invasion of pathogens¹, which prevents body from disease causing pathogens like virus, Bacteria etc. In Ayurveda, it is termed as ‘Vyadhikhamatwa’ or ‘Oja’ or ‘Bala’. In these uncertain days, people are suffering from various kinds of diseases due to poor immunity. Here Ayurveda shows its beauty to enhance immunity and prevent diseases by Rasayana therapy. Rasayana therapy is most popular from the time of Charaka. It has very significant role in kayachikitsa. The word ‘Rasayana’ made up of two words; ‘Rasa’ and ‘Ayana’. ‘Rasa’ means ‘nutrition’ and ‘Ayana’ means ‘transportation in the body’. So, Rasayana defines transportation of nutrients to the body’s tissue. The primary fact of Rasayana is nutrition. Rasa is concerned with the conversion, transformation, and regeneration of energy throughout the therapeutic process. Rasa feeds the body, strengthens the immune system, and promotes physical and mental wellness. It is appropriate here to explore the concept of immunity in the ancient science of life that offers a holistic approach regarding immunotherapy. Rasayana therapy can be given to children, middle - aged and elderly to achieve longevity, memory, intelligence, youthfulness, excellence of lusture, complexion, etc. Rasayana therapy helps to build up strong immune system or maintain homeostasis in the immune system prevents body from any disease or resists a developed disease, i. e called Vyadhikhamatwa or Immunity.

Keywords: Rasayana therapy, Immunity, Vyadhikhamatwa, Oja, Bala, Slesma, Immunomodulation, Innate immunity.

1. Introduction

Ayurveda’s Rasayana chikitsa (rejuvenation) is an unique section of the science. The term ‘Rasayana’ refers to constant flow of vital nutrients to the whole body to achieve a state of positive health, virile, youth and disease free State. The word ‘Immunity’ means fighting action of the body from any kind of infection or disease. Immune system protects body from invading microorganisms. The immune system comprises of the study of molecular and cellular components. The Ayurvedic system of medicine deals with treating the disease and prevention & fight against the disease. In this context, Acharya Charak² said that, Rasayana has two main objectives, viz:

a) Svasthshyo swastharakshanam

To maintain health of healthy individuals or to prevent development of disease, is called **immunity**.

b) Aturasya bikaraprashamanag cha

To cure the disease of diseased one’s by correction of dosha disturbances and improve Agni and Dhatu function, which enhances general strength and immunity.

Rasayana therapy is the main therapy to treat immunodeficiency by enhancing the functions of Rasadi dhatus and enriching ojas.

Thousands years ago Vyadhikhamatwa (Immunity) was described by Acharya Charaka.³ It is defined as the resistance power to keep body disease free and kill the microorganisms. The aim of Ayurveda is to protect the health before occurrence of disease and to cure the diseased one.

1.1 Immune System

Immunity refers to possessing adequate biological defences against infection, illness and other biological invasion. It is the body’s capacity to prevent harmful microorganisms from entering it⁴. Before birth, the cells of the human body remain immunologically immature. Proteins make the body cells vulnerable for development of antibodies after birth. The mechanism of immune response involve primarily in the

recognition of the antigen mainly by the macrophage cells which is followed by formation of antibodies or cell mediate immunity by B and T lymphocytes respectively⁵.

There are three levels of barrier against the pathogens⁶:

a) The Physical barrier - The skin and mucous membrane (non - specific).

b) The Innate immune system - Start non - specific response immediately after breach of physical barrier. It is present since birth. This inborn capacity protects body from entering foreign matters and if enters it eliminates them before development of any disease pathology. It represents the first line of defence. It is modulated by following mechanisms -

- Phagocytosis by WBCs and tissue macrophages.
- Enzymes of GIT and acid of stomach.
- Keratinised stratum corneum protects skin.
- Lysozymes and some polypeptides in tear and sweat⁷.

1.1.1 Adaptive immune system

The ability to identify the pathogens and to remember their subsequent invasion, is called specific immunity. It is categorized into Humoral and Cellular immunity. Humoral immunity is mediated via immunoglobulins are propagated by B - lymphocytes. These, however, cause the complement system to be activated, which destroys the antigen. Actually, the main line of defence against bacterial infection is humoral immunity. T lymphocytes have a role in cellular immunity. It is liable for delayed allergic response. It is a major defence mechanism against infection by viruses, fungi and some bacteria. This is also important for protection against tumours.⁸

The aim and objectives of this review article encompasses the immunomodulation by rasayana drugs as well as review of mentioned rasayana drugs for specific disease.

2. Methodology

A systematic review of the ancient ayurvedic texts as well as recent literature (from 2018 to 2022) was conducted

focusing exclusively on the immunomodulation by rasayana drugs in Ayurveda. The following references were used to gather relevant information: PubMed (<https://pubmed.ncbi.nlm.nih.gov/>), and Web of Science (<http://apps.webofknowledge.com/>), using keywords such as, "Immunity", "Immunomodulation", "Rasayana therapy", "Vyadhikhamatwa", "Innate immunity", "Ayurveda and Rasayana", "Bala and Sleshma", "Oja". Various information were found and mentioned in this journal. Multiple information and a long and sustained history of use of plants to cure various diseases by immunomodulation, were gathered. These huge number of Herbal clinical studies are based on classical Sanskrit literature, mainly Charaka samhita, Sushrut samhita, Astanghridayam, Sarangadhar samhita etc.

3. Observation

3.1. Immunity in Ayurveda

Ayurveda and western medicine have different concepts on immunity. Here immunity is described as Vyadhikhamatwa which signifies a resistance against the damage of individual's Dosa (bio - energies) and dhatu (tissue). The balance of Dosa, agni, dhatu, mala etc ailments of body and pleasant state of atma, indriya & mana is considered as Swasthya (Healthy body). So, it can be considered as Vyadhikhamatwa (immunity) in Ayurveda. There are two different varieties of this immunity one that protects the health of healthy individuals and the other that evicts diseases that have already manifested disease.

3.1.1. Vyadhikhamatwa:

Vyadhi + Khamatwa – Opposes the vyadhi bala and prevents the vyadhi.

Ayurveda has two objectives i. e prevention and promotion of the health and secondly cure from the disease. Acharyas promoted the use of rasayan is to enhance the oja and immunity.

Rasayana therapy has the power to improve immunity of person and keeps him away from the disease. Vyadhikhamatwa is also called Bala. Bala includes – Vyadhi khamatwa - Resistance to diseases.

Vyadhi - bala virodhikmatwa - Lessen the strength of already manifested disease.

Utpada pratibandhakatwa - Prevention of the unmanifested disease.

Rasayana therapy is the main therapy to treat immunodeficiency by enhancing the functions of rasadi dhatus and enriching ojas (Vital force of life). Rasayana therapy helps to maintain the equilibrium state of dhatus (bodily tissue) and gives rise to arogyam i. e healthy state. Oja, Sleshma and Bala are the synonyms of vyadhikhamatwa.

3.1.2. Oja

The essence of sapta dhatus (7 tissues) of the body is known as Oja⁹. Oja is the vital energy of life, which impregnates all tissues and cells, and it is the seat of Bala (Strength). Hence, it is called as Bala. Oja has been considered as vital in the defence mechanism of the body. It resides in the hridaya (heart) but also circulates all over the body and maintains healthy status of the body.¹⁰ There are two types of Oja -

Para Oja - Exists in a quantity of 8 drops and it is located within the heart, its loss leads to death.

Apara Oja - It is distributed throughout the body.

3.1.3. Slesma

In Ayurveda it is told that 'prakritastu bala slesma'. That means equilibrium state of slesma is bala or Oja or strength. The abnormal state of slesma is called Mala (waste) and Pampa (Disease)¹¹. Functions of normal kapha is Sneha bandha (compactness), sthiratwa (stability), gourav (heaviness), brishata (virility), bala (immunity), kshama (resistance), dhriti (courage), alobha (greedlessness) etc; which are similar to oja¹².

3.1.4. Bala

Bala is the synonym of vyadhikhamatwa. It is the output of normal state of dosa, dhatu and mala of the body. It is the body's normal functional identity.¹³ Bala imparts Sthira upachita mamsa (firm integrity to the muscles), sarba chesta pratighata, swara barna prasada (improves the voice and complexion), bahya - abhyantar karananamakarya (external and internal functions).

Bala is of three types i. e. Sahaja (constitutional), kalaja (temporal) and yuktikrita (acquired).¹⁴

Sahaja Bala¹⁵: It is an inherent power or inborn power of an individual. It is the equilibrium state of tridosa.

Sahaja bala can be correlated with Innate immunity also termed as nonspecific immunity. It is the body's innate ability to fend pathogens by birth.¹⁶

Kalaja Bala: This kind of bala or power is depending on age and season; for example, loss of strength is observed in adana kala, gaining of strength is observed in visarga kala and middle age is considered as full of strength.¹⁷

Yuktikrita Bala: Yuktikrita bala is the one which can be gained by adapting proper diet and daily regimen i. e dinacharya and ritucharya.

According to Acharya Chakrapani, bala can be obtained by consuming nourishing foods like meat, ghee etc as well as following a routine that includes proper exercise by taking breaks in between sets of exercises and using a variety of rasayanas.

Yuktikrita bala can be correlated with Acquired immunity. It is of two types -

a) Active immunity - It occurs when one makes his/her own antibodies by getting a disease or vaccination.

b) Passive immunity - It occurs when the antibodies come from some other sources like breast milk.

There are various methods mentioned in ayurveda that are considered to enhance the bala of an individual and as they are done by acquiring or external means so it can be considered to promote yuktikrita bala like; Dinacharya, Ratricharya, satma bhojon, yoga, Masanumashik garbhini paricharya, Pungsaman karma, Sodhon karma, lehana karma, Medhya rasayana, Sadvritta, Achara rasayana and

using rasayana & vajikaran dravyas.

4. Types of Rasayana

There are different types of Rasayana and their mode of action are mentioned in table 1.

5. Mode of action of Rasayana dravyas: ¹⁸

Rasayana strengthens the entire physiology, producing resistance against disease. Rasayana drugs are benefitted for preservation of positive health. Rasayana is a special method of healing that affects the Dhatu, Agni, Ojas and srotas, which are the foundational elements of the body. Various Rasayana drugs may act different pathways by their distinct pharmacological action.

According to Acharya Charak, "labhodayo hi sastanam rasadinam rayayanam".¹⁹ So, it may be presumed that, Rasayana drug promotes nutrition through following modes.

At the level of Rasa: By thriving nutritional grades of poshak rasa, the rasayana drug performs a significant role at the level of rasa. Generally, madhur rasa and guru, snigdha, sita properties are present in rasayana drugs. Hence, it acts at the base of rasa and boost the nutritional value of tissue plasma, which helps in getting the best qualities of dhatu.

At the level of Agni: Rasayana drugs have a initial effect at the level of Agni which affects digestion and metabolism. By accelerating the metabolic process, the rasayana drugs having usna, laghu, ruksha and katu, tikta and kashaya rasa may perform at the level of agni which, leads to an improved structural and functional pattern of tissue.

At the level of srotas: At the level of srotas or micro channels, rasayana drugs have a fundamental impact. These rasayana drugs help to improve bioavailability of nutrients to the tissues and tissue perfusion. Srotosodhon is caused by rasayana drugs having katu, tikta, kashaya rasa, as well as vishada, ruksha, laghu guna, usna virya and katu vipaka.

At the level of Oja: There are some rasayana drugs that directly influence the better formation and functions of Oja.

In modern aspects, the mechanisms of rasayana drugs are²⁰:

Antioxidant action -

Anti - oxidant properties are present in rasayana drugs. Antioxidants are chemicals that lessen the oxidative damage, caused by free radicals. Enzymes and other compounds like vitamin C, vitamin E and beta carotene are examples of antioxidants that can interact with the harmful effects of oxidation.

Example - Ashwagandha, Guduchi, Amlaki.

Immunomodulatory action -

Rasayana drugs such as Guduchi, Haridra, Pippali, Silajatu are observed to possess immunomodulating effects. The promotion of body's defensive mechanism, such as raising the WBC count and enhancing immunological function, is one strategy to increase immunity. In an in vitro study on

immune competent cells, aqueous extract of the stems of Guduchi was found enhancing T as well as B cells responses and protected mice against experimental infections (Sainis et al, 1998).

Example - Bramha rasayana, Amritaprash rasayana.

Improving immune status -

Ayurvedic rasayana drugs may act anti cancerous by improving immunological status of the patient and by rendering protection from side effects of radiation and chemotherapy. Some rasayana drugs were found to inhibit skin carcinogenesis and hepato - carcinogenesis induced by NDEA (Ramadasan Kuttan, 1998).

Example - Haridra, Amlaki, Bhuiamla, Kutki.

Anti ageing action -

Ageing is the natural phenomenon of life. Weakness of muscle, lack of vision, memory loss, low appetite, low immune function etc are the changes related to passage of time. Free radicals cause oxidative damage to various biological molecules including as cell membranes and lipoproteins, which may speed up the ageing process. Here Rasayana drugs are very effective in delaying the ageing process.

Example - Ashwagandha, Chawanprash, Bramha rasayana.

Bacterial and anti microbial activity -

Various rasayana drugs have anti microbial activity.

Example - The aqueous and organic extract of Neem, Amalaki, Ashwagandha, Tulsi, Vasa etc have bactericidal activity against M. Tuberculosis in vitro (Saroja, S. et al., 1997)

Ageing is the natural process and changes occur during aging progress. Rasayanas are very effective in delaying those changes. According to Acharya Sarangadhar and Bhavprakash, every individual is at risk of losing certain qualities at every decade. The following table (Table 2.) consider these changes and prescribe possible rasayana dravyas to prevent their effects²¹.

6. Discussion

Ayurveda has a unique branch called Rasayana chikitsa. It was most popular in the time of Charaka, with the passes of time when occurrence of diseases become more frequent, its preventive and positive healthy aspect turned towards therapeutic aspects and come to be regarded as a part of Kayachikitsa. Rasayana chikitsa is one of the methods of treatment used in Ayurveda to maintain good health. Vyadhikhamatwa or Immunity, is the term used to describe the body's natural ability to fend off disease. By virtue of its nutritional properties, rasayana treatment strengthens the tissue elements and also provides other benefits such as strength, energy, immunity, willpower, determination, the desired complexion, lusture, intellect and memory. Today's environment and threatened lifestyle, slowly damaging dhatus (body tissues) of the body, resulting development of various diseases and faster ageing process. To prevent dhatus

from the damage, rasayana drugs are very helpful. Rasayana drugs strengthen dhtus and delayed the ageing process by enhancing the tissue immunity. Rasayana therapy increases the longevity of life by strengthening the mental and physical power.²² According to several studies, rasayana drugs include Ashwagandha (*Withania somnifera*), Amlaki (*Embllica officinalis*), Guduchi (*Tinospora cordifolia*), Pippali (*Piper longum*) are immune busting drugs. Rasayana drugs contain immune stimulant, antioxidant, and anti - stress properties, according to experimental study on various rasayana drugs²³.

7. Conclusion

In Ayurveda, Rasayana chikitsa is one of the holistic approach of treatment, combines preventive, primitive and curative aspects for healthy & happy life. Rasayana therapy can be correlated with immune - modulator in modern system of medicine. Herbs, used to cure various types of disease by immunomodulation, are called Rasayana dravyas, which gives long life with youthfulness, enhanced memory, brilliance, strength of the body & mind, pleasant personality.

The rasayana drugs are of use in the prevention, treatment, and improvement of the quality of life of both healthy and diseased individual. Regular use of Rasayana drugs benefits human against other age related disease and ailments. Rasayana dravyas can also be employed to keep normal mental and physical health. Rasayana drugs can be used alone or as an adjuvant. Different activities of rasayana drugs like Immunomodulatory, anti - ageing, anti - oxidant, anti - inflammatory etc are in use for maintaining healthy lifestyle and disease free life.

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