

IMMUNOLOGICAL BENEFITS OF RASAYANA DRUGS: AN ALTERNATIVE MEDICINE

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ABSTRACT

Ayurveda has been considered as age old science of life. Ayurveda, a science of long life, almost 6000 years old, can serve as a “goldmine” for novel anti-inflammatory agents used for centuries to treat chronic diseases. In Ayurveda the superior vital essence of all bodily tissues is called *Ojas*. It is responsible for defense of human body against diseases like diabetes, immunodeficiency disorders and malnutrition. Acharyas promoted use of *Rasayanas* to enhance *Ojas*. *Rasayana* contains several plant extracts and some of them have immunomodulatory, immune-stimulant and antioxidant properties. Hence, *Rasayanas* are indicated in the management of a wide range of chronic diseases, diabetes to cancer in addition to preventive & maintenance of health. This paper is an attempt to provide information on Ayurvedic therapeutics and their benefits.

Keywords: Ayurvedic medicine, Rasayanas, cancer, immunity

INTRODUCTION

Ayurveda has been considered as age old science of life. There has been a constant increase in demand for the products of Ayurveda in foreign countries, because the allopathic drugs have more side effects. Ayurveda is a traditionally being practised for thousands of years. Many researches and clinical trials have been carried out on Ayurvedic medicinal plants. By applying different approach, Ayurvedic medicines are often made available to an individual

need. Traditional knowledge of Ayurveda can benefit human kind with reduced time and cost of development. Ayurveda, a translational science with rich essence is percolated from knowledge based Veda. This got systematized for human kind for the prevention and cure of disease condition.¹ In addition to promotion, maintenance of *Rasayana* treatment in the contemporary literature is also advised. There are drugs or *Rasayana* aimed for nourishment of *Rasa*

(nutrient) and *Rasayani* (transportation channels) for optimum preventive and promotive effect.

Ayurveda: the ancient science of life

Ayurveda remains one of the most ancient and yet living traditions practised widely in India, Sri Lanka and other countries and has a sound philosophical and experiential basis^{2, 3}. *Atharvaveda* (around 1200 BC), *Charak Samhita* and *Sushrut Samhita*⁴ (1000–500 BC) are the main classics that give detailed descriptions of over 700 herbs. India has about 45,000 plant species; medicinal properties have been assigned to several thousands.⁵ Currently, with over 400,000 registered Ayurvedic practitioners, the Government of India has formal structures to regulate quality, safety, efficacy and practice of herbal medicine.⁶ With unique holistic approach, Ayurvedic medicines are usually customized to an individual constitution. The Ayurvedic database available in classic texts has many applications. Valuable information of therapeutic potential and selective benefits to people with different constitutions can be obtained.

Ojas: quintessence of the seven dhatus

Ojas is our vital energy which pervades all tissue, cells and spaces. The ultimate distillation of each tissue combined together and it is the main determinant of our immune status and hence our resistance to disease. Two kinds of *Ojas* are 1) *Para Ojas* which is *asta bindu* (eight drops) in quantity and is located in the heart, 2) *Apara Ojas* which is *ardhanjali pramana* and is spread all over the body⁷. There are the three clinical conditions arising due to impairment of *Ojas* are:

- 1) *Ojo Visramsa*- due to mild,
- 2) *Ojo Vyapat* - due moderate
- 3) *Ojoksaya*- due to severe impairment in *Ojas* to the tissues

These conditions arise out of injury to or diseases of the channels of distribution of this vital substance, its altered composition and deficiency respectively. The etiological factors bringing these conditions or the causes for reduced immune capability, range

from trauma (both physical and microbial), severe degenerative and wasting diseases, malnutrition, starvation, psychological stress, anger, anxiety and grief etc.⁸

Pharmacodynamics in Ayurveda:

Five fundamental principles viz. *Rasa*, *Guna*, *Virya*, *Vipaka* & *Prabhava* collectively known as *Rasa panchaka* explains pharmacodynamics in Ayurveda. *Prabhava* has been described as that principle of drug action which overwhelms the other four principles. *Prabhava* can thus be defined as that specific property of a drug on virtue of which it is able to produce a specific and different action from another drug having same set of *Rasa*, *Guna*, *Virya* & *Vipaka*.⁹

Rasayana: An Ayurvedic standpoint

One who uses the Rasayana treatment methodically attains not only long life but also the auspicious status enjoyed by the godly sages.

Rasayana Tantra is one of the eight clinical specialties of Ayurveda. It refers to nutrition, natural resistance which in turn upholds increased immunity. Acharyas promoted use of Rasayana to enhance *Ojas*⁷. Rasayana measures act by one of the following three ways:

1. Acting at the level of *Rasa*: Thus directly improving the quality of nutrition
2. Acting at the level of *Agni*: i.e., by improving the digestion and metabolism of the body and thereby affording better nutrition.
3. Acting at the level of *srotas*: i.e., by improving the micro-circulation, it ensures proper perfusion and nourishment of the tissue.

The Rasayana drugs and formulations provides longevity, memory, intelligence, freedom from disorders, youthful age, excellence of luster, complexion and voice, oratory, optimum strength of physique and sense organs, respectability and brilliance.⁸

Rasayanas based on drug, diet and life style.¹⁰

1. *Aushadha Rasayana* - Drug Based *Rasayana*.
2. *Ahara Rasayana* - Dietary *Rasayana*.
3. *Achara Rasayana* - Lifestyle *Rasayana*.

RASAYANA: MECHANISM OF ACTION

The *Rasayana* herbs seem to exert their effect through immunosuppressant, immunostimulant and immunoadjuvant activities or by affecting the effector arm of the immune response. It has been found that the nervous, endocrine and immune systems are all interrelated. Immune products like various cytokines have been found to stimulate the hypothalamus-pituitary-adrenal axis and corticotrophin release factor (CRF), which ultimately enhances the production of adrenal corticotrophic hormone (ACTH) resulting into increased secretion of glucocorticoids which have an overall suppressive effect on the immune system. Stress also acts on the same axis and brings about changes in the immune status of the body. These *Rasayana* drugs probably reduce stress levels by affecting antioxidant levels. So these *Rasayana* drugs act as potent antioxidants and neuroendocrine Immunomodulators.¹¹

Role of Rasayanas as Immunomodulators:

Herbal medicines are prepared from a variety of plant materials – leaves, stems, roots, bark and so on. They usually contain many biologically active ingredients and are used primarily for treating mild or chronic ailments¹². The herbal preparation is effective or the treatment of the wide range of physiological and pathological conditions in the human body resulting from a weakened or deteriorating immune system¹³. Natural compounds from medicinal plants having antioxidant and immunomodulatory activities have potential as therapeutic agents¹⁴. The basic concept of immunomodulation not only existed in Ayurveda but is being really practiced by the Ayurvedists for centuries. In fact, one of the therapeutic strategies in Ayurvedic medicines is to enhance the body's overall natural resistance to the disease causing agent rather than directly neutralizing the agent itself. In Ayurvedic practice, the objective of immune enhancement is achieved through the use of the *Rasayana* and *Vajikarana* therapy, following *Achara Rasayana* measures. Ayurveda describes a number of drugs as *Rasayana* and *Ojovardhak* remedies, which are

claimed to possess immunomodulatory effect. Some of the *Rasayanas* which have been subjected to scientific studies and found to possess immunomodulatory effect are *Aswagandha* (*Withania somnifera*), *Shilajatu*, *Amalaki* (*Emblica officinalis*), *Tulasi* (*Ocimum sanctum*), *Guduci* (*Tinospora cordifolia*), *Pippali* (*Piper longum*) and *Punarnava* (*Boerhaavia diffusa*), of which *Guduci* and *Tulasi* have been extensively studied.⁸

Asparagus racemosus:



Fig 1: *Asparagus*

Asparagus racemosus (AR) Willd is an important medicinal plant indigenous to South Asian countries. Its medicinal properties are reported in traditional systems of medicine such as Ayurveda. Ayurveda describes AR as *rasayana* and galactagogue, which is used to treat various diseases such as ulcer, dyspepsia and debility. AR hydro-alcoholic extract was found to induce lag in tumour development in experimental animals. Modulation of Th1/Th2 immunity is emerging as one of biological targets for such immunostimulants. *A.racemosus* root aqueous extract is known to exhibit immunopharmacological activities under different biological stimuli and has mixed Th1 and Th2 adjuvant properties. AR roots were also reported to modulate macrophage functions resulting in significant reduction in severity of peritoneal adhesions.¹⁵

Aswagandha:

Aswagandha extensively used in Ayurvedic medicine, and often compared to Ginseng; its immunomodulatory, anti-inflammatory, and hence anti-arthritic, and other biologic effects have been extensively documented. The immunomodulatory activities of an Indian Ayurvedic medicinal preparation, i.e. extracts from *Aswagandha*, *Withania somnifera*

was studied. Cyclophosphamide-induced immunosuppression was counteracted by treatment with *Withania somnifera*, revealing significant increase in hemagglutinating antibody responses and hemolytic antibody responses towards sheep red blood cells.¹⁸

Guduchi & Punarnava:



Fig 2: *Punarnava*

Enhanced secretion of lysozyme by macrophage cell line J774A on treatment with *Tinospora cordifolia* and lipopolysaccharide was observed, suggesting activated state of macrophages. The enhanced inhibitory effect of *T. cordifolia* (direct effect) and *T. cordifolia* treated cell supernatant (indirect effect) on the bacteria *E. coli* indicates the susceptibility of bacteria. *T. cordifolia* can be used as immunomodulator for activation of macrophage¹⁹. *Guduchi* (*Tinospora cordifolia*) and *Punarnava* or *Boehreria diffusa* (Fig2) have shown very impressive effects on protecting body from the side effects (of chemo and radio therapies) like alopecia, nausea, constipation, anorexia and vomiting. *Tinospora cordifolia* could be used as radio-protector in patient undergoing radiotherapy for head and neck cancer.²⁰ The patients who receive Ayurvedic treatment along with chemotherapy have shown more regularity in maintaining the chemotherapy cycles as the haematological levels can be maintained up to a normal state.⁸

Yastimadhu:



Fig3: *Yastimadhu*

Yastimadhu or *Glycyrrhiza glabra*, another important Rasayana drug has been found to be immunostimulative, which accelerates lymphocytic transformation activation of macrophage and increases the leucocyte count. It also has antiallergic, anti-inflammatory and antioxidant activity.⁸

Amalaki (*Emblia officinalis*) and Tulasi (*Ocimum sanctum*):



Fig4: *Amalaki*

Guduchi (*T.Cordifolia*), *Aswagandha* (*W.Somnifera*), *Amalaki* or *Emblia officinalis* and *Tulasi* or *Ocimum sanctum* in equal amounts was found to potentiate both the cellular and humoral components of immunity. It is significantly increased the microbicidal activity of the neutrophils and circulating levels of globulins and other components. It also significantly elevated the number of lymphocytes along with improvement in T-cell memory. The combination was found to potentiate the immune status and helped in faster recovery when used as an adjunct to specific therapy in cancer, chronic wasting diseases, multidrug resistant tuberculosis and other immunocompromised conditions.⁸ The results obtained from *in vitro* and *in vivo* studies in 2007 at Manipal indicate that several botanicals such as *Ocimum sanctum*, *Emblia officinalis*, *Piper longum*, *Tinospora cordifolia* protect against radiation-induced lethality, lipid peroxidation and DNA damage.²¹

Curcuma longa:

Gaoa *et al.* was extracted of Curcumin in the plant of *curcuma longa*. They have reported that the effect of Curcumin on mitogen/antigen induced proliferation of splenic lymphocytes; induction of cytotoxic T-lymphocytes (CTLs), lymphokines activated killer (LAK) cells and the production of cytokines by T-

lymphocytes and macrophages. Curcumin also inhibited the IL-2 induced proliferation of splenic cells. A study in 2007 showed herbal extracts as such, Curcumin from turmeric are potential antioxidants either in the form of mixture as in herbal extract or as an isolated compound.²²The Curcumin is used for the treatment of anti-inflammatory, antiarthritic, common colds & coughs, jaundice.²³

DISCUSSION

With increasing chronic, psychosomatic, stress and lifestyle-related disorders, Ayurveda with its different understanding of the human body and distinctive approach can play a crucial role in the future of healthcare. Ayurveda with different holistic approach to health, disease, diet and lifestyle activities can play an important role. The modulation of immune response by using Ayurvedic herbal medications as a possible therapeutic measure in modern scientific understanding would mean enhancement of immune responsiveness of an organism against a pathogen by nonspecifically activating the immune system using immunomodulatory agents of plant origin.

CONCLUSION

A golden triangle consisting of Ayurveda, modern medicine and science will converge to form a real discovery engine that can result in newer, safer, cheaper and effective therapies.

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