

Immunological Benefits of Rasayana Drugs: An Alternative Medicine

Dr. Ashutosh Kr. Bhardwaj

B.A.M.S., MD, Assistant Professor, Govt. Ayurvedic College, Patna

Dr. Arvind Chaurasia

Professor & HOD, Dept. of Bal Roga, Government Ayurvedic College, Patna

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 immune-modulatory, 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, Rasayana, 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 practiced 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 practiced 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 too 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 special- ties 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 cyto- kines have been found to stimulate the hypothalamus-pituitary-adrenal axis and corticotrophin release factor (CRF), which ultimately enhances the production of adrenal corticotropic 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 physio- logical 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 immuno- modulation 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 (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 tumor 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 immuno-modulatory, 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 immuno-suppression 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:

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 *Boerhaavia 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 radioprotector in patient undergoing radiotherapy for head and neck cancer.²⁰ The patients who receive Ayurvedic treatment along with chemo therapy have shown more regularity in maintaining the chemotherapy cycles as the hematological levels can be maintained up to a normal state.⁸ *Yastimadhu* or *Glycyrrhiza glabra*, another important Rasayana drug has been found to be immune stimulative, which accelerates lymphocytic transformation activation of macrophage and increases the leucocyte count. It also has anti-allergic, anti-inflammatory and antioxidant activity.⁸ *Guduchi* (*T. Cordifolia*), *Aswagandha* (*W. Somnifera*), *Amalaki* or *Emblica officinalis* and *Tulasi* or *Ocimum sanctum* in equal amounts was found to potentiate both the cellular and humoral component 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 immune compromised conditions.⁸ the result obtained from in vitro and in vivo studies in 2007 at Manipal indicate that several botanicals such as *Ocimum sanctum*, *Emblica 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 is potential antioxidants either in the form of mixture as in herbal extract or as an isolated compound.²² The 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 health care. 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.

References :

1. Bhushan Patwardhan, Ashok D. B. Vaidya and Mukund Chorghade. Ayurveda and natural products drug discovery. Current science 2004; 86(6): 25
2. Dahanukar, S. and Thatte, U., Ayurveda Revisited, Popular Prakashan Mumbai 2000;3.
3. Chopra, A. and Doiphode, V., Ayurvedic medicine: Core Concept, Therapeutic Principles, and current relevance. Med. Clin. North Am 2002; 86:75-89.
4. Bhagavan Dash and Sharama, B. K., Charak Samhita, Chaukhamba Sanskrit Series Office 2001;7
5. Jain, S. K., Ethnobotany and research on medicinal plants in India. Ciba Found. Symp., 1994;185:153-164
6. National Policy on Indian Systems of Medicine and Homoeopathy 2002. Ministry of Health and Family Welfare, Government of India
7. Sunita Amruthesh. Dentistry and Ayurveda-III (basics - ama, immunity, ojas, rasas, etiopathogenesis and prevention) Indian Journal of Dental Research 2007;18(3):112-119
8. Dr. J.S. Tripathi & Prof. R.H. Singh. The Concept and Practice of Immunomodulation in Ayurveda and the Role of Rasayanas as Immunomodulators. Journal of Ancient Science of Life 99 ; XIX: (1&2)
9. Sudipt kumar rath, Ashashri shinde, Lalit nagar, Ringzin lamo, Pankaj gahunge, Naresh kumar khemani. Prabhava revisited. International Journal of Ayurvedic and Herbal medicine 2012;2(3):569-573
10. Mishra RN . Rasayan – The Ayurvedic Perspective. Research Journal of Pharmaceutical, Bio- logical and Chemical Sciences October 2011; 2(4): 269
11. Rahul Chulet, Pankaj Pradhan. A review on Rasayana. Pharmacognosy review 2009; 3 (6):229-234
12. Dr. Pulok K. Mukherjee. Quality control of Herbal drugs-An approach to evaluation of botanicals. Chap. Herbal remedies -toxicity and regulations. 2002;1: 38-89.
13. Managoli NB. Herbal composition for treatment of immunocompromised condition, US. 2008; 7:344-738
14. TPA Devasagayam and KB Sainis. Immune system and antioxidants, especially those derived from Indian medicinal plants. Indian Journal of Experimental Biology 2002; 40: 639-655.
15. Manish Gautama, Santanu Saha, Sarang Banib, Kaulb, Sanjay Mishra, Dada Patil, N.K. Satti, K.A. Suric, Sunil Gairolad, K. Sureshd, Suresh Jadhavd, G.N. Qazib, Bhushan Patwardhana, Immunomodulatory activity of *Asparagus racemosus* on systemic Th1/Th2immunity: Implications for immunoadjuvant potential .Journal of Ethnopharmacology 2009;121: 241-247
16. R. Govindarajan, M. Vijayakumar, P. Pushpangadan. Antioxidant approach to disease management and the role of 'Rasayana' herbs of Ayurveda. Journal of Ethnopharmacology 2005;99 :165-178
17. Deepa Arora, M. Kumar, S.D. Dubey and Uaha Sings: Immunomodulating effects of rasayana drugs in diabetics – a clinical study. Journal of Ancient Science of Life. 2002 Oct-Dec; 22(2): 42-48
18. Ramesh Agarwal, Sham Diwanay, Pralhad Patki, Bhushan Patwardhan. Studies on immunomodulatory activity of *Withania somnifera* (*Ashwagandha*) extracts in experimental immune inflammation. Journal of Ethnopharmacology 1999; 67 (1):27-35
19. More P, Pai K. Immunomodulatory effects of *Tinospora cordifolia* (*Guduchi*) on macrophage activation. Biology and Medicine 2011; 3 (2) Special Issue: 134-140
20. Dr. Sunita A, Dr. Mubeen, Dr. K.P.R. Pramod, Dr. B.A. Venkatesh, Dr. C. Ramesh. Evaluation of radioprotective effects of *Tinospora cordifolia* in patients on radiotherapy for squamous cell carcinoma of head and neck-A pilot study. IJCD Sept2010; 1(1)
21. Ganesh C. Jagetia: Radioprotective Potential of Plants and Herbs against the Effects of Ionizing Radiation J Clin Biochem Nutr. 2007; 40(2): 74-81.
22. Soumyakanti Adhikari, Kavirayani Indira Priyadarsini, and Tulsi Mukherjee, Physico- Chemical Studies on the Evaluation of the Anti- oxidant Activity of Herbal Extracts and Active Principles of Some Indian Medicinal Plants J Clin Biochem Nutr.2007; 40(3): 174-183.
23. Singh Virendra Kumar, Sharma Pramod Kumar, Dudhe Rupesh, Kumar Nitin. Immunomodulatory effects of some traditional medicinal plants. J. Chem. Pharm. Res., 2011, 3(1):675-684.

