



# Ojas and Vyadhikshamatava- Ayurvedic Perspectives of Immunity and its modulation in Clinical Arena

Gupta A\*

Department of Indian Systems of Medicine, Ayurvedic Hospital, India

\*Corresponding author: Arun Gupta, Directorate of Ayush, Jammu & Kashmir, Government Ayurvedic Hospital, Jammu, India, Tel: 7780908706/ 9596306387; Email: Gupta.arun9@gmail.com

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## Abstract

**Background:** With emerging double burden of infectious and life style disorders across the globe, immune enhancement through Ayurveda approaches is gaining popularity these days to enhance the disease resistance against infection, immune deficiency disorders and auto-immune disorders.

**Aims and Objectives:** To critically explore the classical concept of the Ojas and Vyadhi Kshamatav in its relation with the disease resistance. To find the scope of application of Ojas in clinical perspective.

**Materials and Methods:** Critical review study involving the review of literature from Samhita texts and internet based review of online research databases with keywords of Immunity, Ojas and Vyadhi Kshamatava. 41 articles with abstract were studied 15articles were selected and critically reviewed.

**Discussion:** Immunity is fundamentally an ideal state of Dhatu Samyta (equilibrium) which can be seen as an health asset for resistance towards infection control and inflammation. It is created by a series of health promoting behaviors enlisted in Ayurveda and by employing various rejuvenating modalities (Rasayana).

**Conclusion:** Immunity as per modern medicine thought is specific to only host-pathogen defence but Ayurveda takes integrative immunity in perspective and explore all the factors which affects the well being and hence disease resistance of an individual.

**Keywords:** Immunity; Bala; Ojas; Vikarananam Anutpattikara Bhava; Vyadhi Kshmatava

## Introduction

The Darwinian thought of Survival of the fittest is being realized in the present times and only those who have strong armours called 'Immunity' can win over the deadly viruses and their toxic effects on the body. Immunity is the buzz word in public health circles in these prevalent times of Corona virus pandemic. All the public health efforts are being oriented towards optimizing the immune response

of the body cells to neutralize the virus and its toxins, so that disease does not manifest itself or body tissues are not affected by the deleterious effects caused by infection control response of the body. In order to understand the perspective of Immunity, one needs to understand the origin of the word and the context in which it is used. The word 'Immunity' is derived from the French word 'Immunité' which means privilege, inviolability. In Latin, it is originated from 'Immunitatem' meaning 'exemption' from a service or charge,

exempt free [1]. Merriam Webster defines Immunity as a condition of being able to resist a particular disease caused by micro-organism and the effects of microbial pathogenic products [2]. In common parlance it is known as disease resistance. The current medical literature defines immunity as the capability of multicellular organisms to resist harmful micro-organism [3]. The conventional bio-medical system of medicine looks upon immunity as host response to neutralize the microbes and their toxins, viruses, cancer cells by specialized cells in the body. With the emergence of auto-immune disorders, immune-pathologies, allergies and non-communicable, Immune responses has manifested in the form of double edged sword, its under and over expression can actually harm the body constituents which may lead to many serious disorders some of which are very hard to treat and sometimes even lethal. From this brief introduction of this power word "Immunity" one can infer that it is defensive response of the body towards a physical, chemical, biological or psychological agent which is liable to disrupt the homeostatic Balance. This view brings 'Immunity' very close to the concept of "Dhatu Samyata" "Arogya" or health in Ayurvedic perspective. In Ayurvedic perspective, in the context of the origin of Ayurveda, Acharya Charaka has explained in a lucid manner that, Ayurveda originated to enhance the disease resistance of the humans who were afflicted with various illnesses affecting their higher pursuits [4]. 'Ayurveda' therefore conceived with prime aim of establishing 'Arogya' and 'Dhatu Samya in ailing humanity' [5]. This makes Ayurveda the first science of enhancing disease resistance by various approaches which are elaborated in the volumes of classical treatises. This is what is expressed as the primal objective of this great knowledge system: continuous health maintenance and health preservation (*swasthysya swasthavruttanuvrutti*) [6]. over and above the disease eradication. Because diseases only manifests in an milieu which is afflicted with vitiated *Dosha Dhatu, Mala* and *Srotas*. This approach prompts Ayurveda to promote various life style and therapeutic measures which help in creating a internal environment in which diseases and disorders do not occur and state of health remains preserved. These measures are referred to as *Ajata Vikaranama anutpattikar bhava'* [6].

This preventive and promotive aspect of health care is the essence of Immunity in Ayurveda.

In contemporary era, 'Ojas' or 'Vyadhi Kshmatava' are the two famous connotations or correlations of Immunity in 'Ayurveda' as many of the available review studies on Immunity from Ayurvedic perspective elaborate these two fundamental concepts. This essay is purported to explore the concept of Immunity as a basic tenet of *Oja/Ojas* and *Vyadhi Kshmatava* (disease resistance) with the available current scientific literature and to establish Ayurvedic perspectives and practices of immune- enhancement. In this study various aspects of *Ojas* as immunity, its origin in the body, signs of its manifestation in the body, its pathological states and the different types of *Bala or Ojas* and their therapeutic and clinical perspective will be discussed in the light of current research evidence.

## Material and Methods

*Charaka Samhita, Sushruta Samhita, Ashtanga Hrudaya* with their commentaries, online Ayurveda research portals, Dhara, AYUSH portal and other research portals like Google scholar, scopus were searched for the references of *Ojas, Bala, Vyadhi Kshmatava*. Chapters from different *Sthana* of the *samhita* where references about *Ojas or Bala or Vyadhi Kshmatava* is found were included in the study. The online database, PubMed, PubMed Central and IndMed were searched for citations for keywords "Ojas" and "Vyadhi Kshmatava" Immunity and Ayurveda, Immunno therapeutics, Immunopathology was searched. Review papers, experimental papers in English, revealing the key words cited above were included in the review [7]. The studies based on Immunochemistry, Immunological tests were excluded. Studies in languages other than English, and whose abstracts were unavailable were excluded from the review. After applying the inclusion and exclusion criteria and removing the duplicates, a total of 41 studies were selected for the final review. The important papers which were studied in details are tabulated as below:

S.no	Keyword	Article Title, Author, Year	Journal	Article Type
1		The Concept and Practice of Immunomodulation in Ayurveda and the Role of Rasayanas as Immunomodulators. Dr. J.S. Tripathi & Prof. R.H. Singh, Vol. No. XIX (1&2) July, August, September, October 99	Ancient science of Life	Review article
2	Ojas	The concept of vyadhikshamatva (immunity) in Ayurveda, K singh, B. Verma 2012.	Ayurpharma intl J Ayur Allied science Vol 1 (5) 2012	Review Article

3	<i>Ojas</i>	Critical Appraisal of Immunity in Ayurveda., Byadgi, P.S. (2005).	Journal of Homeopathic and Ayurvedic medicine	Review Articles
4	<i>Ojas</i>	Concept of Immunity in Ayurveda, JAPS 01(05), 2011, 21-24 Byadgi, P.S. (2005).	Journal of Applied Pharmaceutical science	Review Articles
5	<i>Ojas</i>	Foundations of Immunology in Ayurveda Classics Prof R.H. Singh, March 2015.	Indian Journal of History of Science	Review Article
6	<i>Ojas</i>	Oja vis a vis Immunology in Ayurveda July 2017 5(7)	IAMJ	Review Article
7	<i>Ojas</i>	Immunophenotyping of normal individuals classified on the basis of human <i>dosha prakriti</i>	J-AIM	cross-sectional pilot study
8	<i>Bala</i>	A review on balya action mentioned in Ayurveda	J-AIM	Review
9	Vyadhi Kshmatva	Vyadhikshamatwa-Critical Understanding 3(8)	IAMJ	Review
10	Vyadhi Kshmatva	Volume 8(ISSUE 8):549-559 · January 2019 Clinical Importance of vyadhikshamatava w.s.r to Oja	World Journal of Pharmaceutical Research	Review
11	Vyadhi Kshmatva	Tinospora cordifolia Enhances Vyadhikshamatwa (immunity) in Children	Journal of Phyto Pharmacology	An open-labelled, placebo-controlled, randomized controlled trial
12	Vyadhi Kshmatva	Immunomodulatory activity of <i>Vachadhatryadi Avaleha</i> in albino rats	AYU Journal	Animal study
13	Vyadhi Kshmatva	A REVIEW ON THE CONCEPT OF OJUS, 2016 5(5)	Journal of Pharmaceutical and Scientific Innovation	Review
14	Vyadhi Kshmatva	Rasayana as a public health tool to develop immunity	International Journal of Current Research	Review
15	Vyadhi Kshmatva	Concept of <i>Vyadhi Kshamatva</i> w.s.r. To autoimmune disorders in women : a review 4(4), 2019	IAMJ	Review

**Table 1:** Review of articles on *Ojas* and Vyadhikshamatava.

### Defining 'Ojas' in Ayurveda Swasnajna

In *Sanskrit dictionary, Shabda Kalpa Druma*, synonyms of 'Ojas' are *Bala and Aarjavam*. All the major treatises of *Ayurveda* acknowledge the *Ojas* as *Bala* of the body which can be defined as the sum total of the structural and functional integrity of the body constituents to maintain and restore the state of health or wellbeing.

तत्र रसादीनां शुक्रांतानां धातूनां यत् परं तेजस्ततः खल्वोजस्तद्देव बलमतिरुच्यते (सु.सू. 15/19)

It is the protective shield which protects the body from various physical, environmental, biological and psychological stressors. *Charak Samhita* and *Ashtanga Hrudya* also define *Ojas* as quintessence of the seven formative substances of the

body.

यच्छरीरसंस्नेहः प्राणा यत्र प्रतष्ठिताः (च.सू. 30/11), धातुप्रसाद संज्ञकानीति अत्यरथशुद्धेनैव (च. सू. 28/ 4, चक्र. टी.)

*Acharya Charaka* referred to 'Ojas' as first *shareer Dhatu* which decides the further development of the human frame in the mother's womb, making 'Ojas' as the primal formative structural and functional element of the body which gets manifested after the fertilization and *Jeevopkramana* [8]. It is the first deciding factor which decides the continuance of in-utero life in the *Kalala roopa Garbha*. *Sushruta Samhita* [9] and *Ashtanga Hrudya* [10] also emphasize that it is from the 'Ojas' that different entities of *Sharira* emerge and sustain without which body cannot survive. All the material manifestations of the body upon which survival depends

emerge from *Ojas*. From the point of view of importance, *Ojas* is classified as *Para Oja* with its seat in *Hrudya*, the *Pranayatanam*. It is the first site where the *Ojas* manifested during the inception of life and decides the future course of the in-utero life. The other form is the *Apara Ojas* which can be seen as the circulating primordial *Dhatu* elements which after the *Dhatu Parinama* will convert into the local (स्थायी) *Dhatu*. Hence, the *Para Ojas* is the *Pranaytana* [8,11] and essential for the survival while *Apara Ojas* is the circulating *Ojas* which gets depleted on daily basis depending upon the supply and demand of the individual and requires to be replenished. In *Chraka samhita*, the physician who knows the management of *Pranayatanam* is termed as *Pranabhisara Vaidya*. This highlights the importance which is given to the *Ojas* as it is seen as one of the important factor in the treatment of the disorders. To sum up, one may infer that *Ojas* is the quintessence of life processes in the body which help to maintain the structure and function of the body components by preventing it get afflicted from the various intrinsic and extrinsic stressors and pathogens. It is compared with the *Ghee* and *Honey*. Their formation depends upon the quality of the formative substances i.e. Milk and flower nectar and the series of processes through these essences come into existence. Any diminution in quality of the formative substances or any disruption in the process of formation may lead to malformation of *Ojas* or *Bala* termed as *Ama*, progenitor of all the disorders. This highlights the importance of *Ojas* in health and *Ama* in emergence of disease. On the basis of the origin the *Bala* is defined to be of three types:

### **Sahaja Bala**

It is the congenital resistance towards diseases which one inherits from the parental genes and in-utero environment. It is the sum total of all the epigenetic factors which help in the expression of innate immunity. It has two dimensions, *Sharira Bala* (Physical strength, agility) and *Manasa Bala* (Enthusiasm, Initiative). This type of the *Bala* is due to the natural expression of the *Dhatu samya* which is inherent.

### **Kalaja Bala**

It is the temporal resistance towards diseases, resilience and strength of the body components. It is due to the seasonal variations in the strength and age related factors. Seasonal cyclicity also affect our resistance towards disease during the beginning of *Visarga Kala* (*Varsha Ritu*, rainy seasons) and ending of the *Adana Kala* (*Grishma Ritu*, summers), the physical strength of the body gets reduced due to physical factors prevailing in the nature, *Amla Vipaka* of the *ahara* and *aushadha*, *kleda* in the vicinity, high heat. These conditions are congenial for infections during rainy season. In summers the ending of *Adana Kala*, hot and dry conditions of the environment leads to exhaustion and consumption of vital

energy, abundance of foods and *aushadhi* which are *Katu*, *Tikta*, *Kashaya* leading to less *Bala* in the body. Therefore, to sustain and maintain the *Bala Ritucharya* of *this Kala* is very important. Likewise, due to immaturity of *Dhatu* and *Agni* and excess of *Kleda* in childhood this stage of life is more susceptible to the emergence of various diseases. In the senile stages, when degeneration is at its peak it becomes difficult for the body to maintain *Dhatu Samya* the *Bala* or *Ojas* becomes diminished. If it is coupled with *Ama* due to indiscrete diet and lifestyle, disease resistance and healing response against a pathogenic process gets further decreased. This is why, diseases in elderly are considered as hard to treat (*Kricchrsadhya*) or incurable (*Asadhya*).

### **Yukti Kruta Bala**

This dimension of *Bala* is acquired strength of the *Dhatu* and *Srotasa* by following *Swasthvrutta* and includes *ahara* (optimal nutrition), *Vyayama* and *Virama* (optimal rest and exertion) includes *nidra*, *rasayana prayoga*. This acquired disease resistance also deals with the adaptive immunity and acclimatization. This involves planned and outcome based changing diet and lifestyle factors according to the living conditions. *Yukti Kruta Bala* is programmed immunoenhancement element associated with the management of a disease. Every pathogenic mechanism targets a specific *Dhatu*, *Srotas*, therefore in order to strengthen a particular *Dhatu* and *srotas* we have different strengthening approach and *kalpa* described in context of those diseases like Use of *Pippali Rasayana* in *Jeerna Jwara* while *Takra Kalpa* in *Arsha* and *Grahni*.

These three forms of *Bala* are integrated in human body to provide a lifelong shield of immunity against various pathogens. It requires human beings to be effortful for enhancing *Bala* with all the three approaches of *Bala* enhancement i.e. *Sahaj*, *Kalaj* and *Yukti Krut* as a continuum of immunity care throughout the life right from the inception to death.

### **Assessment of Ojas in Individuals**

Till date there is no single, clinical, laboratory or radiological parameter which can predict the immunity or disease resistance of an organism. Laboratory tests which are currently available only assist in the clinical correlation of a diseased state with some under activity or hyperactivity of immune cells. As we have seen, Immunity is a holistic integrative function of different components of the body, therefore, it would be inapt to see immunity solely from the lens of different immune markers available in the immunoassays. From, *Ayurvedic* perspective it is difficult to assess *Ojas* quantitatively in an individual though its quantitative aspect is discussed in classical treatises. As

described in the outset, *Ojas* is a factor which is present in every component of the body (सर्वदेह व्यापनिः सावयवस्तेन) regulating their structural and functional integrity. Therefore, it is important to assess functioning of *Ojas* or *Dhatu Samya* in the body from the integrative features of health i.e. *Arogya Lakshana* as mentioned in *Charaka Samhita* [12]:

- *Rugapshamanam*: Absence of any discomfort, pain or distress.
- *Swar varna Yoga*: Healthy structural appearance and speech.
- *Shareer Upchaya*: Optimum Growth
- *Bala vrudhi*: Optimum, Physical, Mental and Psychological strength and agility.
- *Abhyavararya Abhilasha*: Interest in food.
- *Ruchiraahra Kaale*: Appetite
- *Kaale Samyagjarnanam*: Time bound digestion of food.
- *Nidra Laabho Yatha Kaale*: Good sleep at appropriate time
- *Vaikaarika Svapana Adarshanam*: No bad dreams and thoughts
- *Sukhena Cha Pratibodhanam*: No difficulty in awakening after sleep
- *Vaata Mutra Purish Retas Artava mukti*: Proper efflux of urine, feces, semen and menstruation
- *Sarvakaare Mano Buddhi Indriyanam Avyapatti*: No sensory, intellectual and Psychological distress.

*Acharya Sushruta* further summarizes the *lakshana* of *Ojas* or *Bala* in the following features:

तत्र बलेन स्थरीपचतिमांसता सर्वचेष्टास्वप्रतघातःस्वर वर्ण प्रसादो बाह्यानामाभ्यांतराणां च करणानामात्मकार्यप्रतपित्तरिभ वती। (सु. सू. 15/20) [13]

The markers of immune strength are elucidated as appropriate growth and development of the organs and organ systems, unhindered or organized physical, mental and vocal activities, healthy voice and appearance of the person, organized distress free functioning of all the sensory, motor and cognitive apparatus of the body. These two can be used for the assessment of the functions of *Ojas* or *Bala*. If an individual functioning levels deviates from these, it indicates towards the presence of *Ama* or emergence of a diseases which requires to be corrected by taking appropriate therapeutic measures of Diet, Behaviour and Conduct. Hence we can use this explicit *Ayurvedic* quality of life criteria or Health criteria which include almost every detail of the body and mind function to assess the *Vyadhi Kshamatav*, resistance to disease. The more the additive score an individual scores on this scale, the better would be his level of functioning, from which one can easily predict the status of his or her *Ojas* or *Bala*.

*Ayurveda* focuses directly on maintaining and retaining the state of health and to avoid the emergence of diseases in

this context Immunity is also defined as *Vyadhi Kshamatva* the term which is elaborated by *Acharya Chakrapaani* as: “व्याधकिष्मत्वः - व्याधबिल वरिधतिव व्याध्युत्पाद प्रतबिंधकत्वमिति”, this is possible only when *Dhatu* and *Srotasa* are able to defy the pathogenetic forces by virtue of their structural and functional integrity which is an expression of *Ojas*. Hence, *Ojas* and *Vyadhi Kshamatva* are the two sides of the same coin, while the former is more health centric term latter is a disease centric term. The common thread joining the two is the exemption from the disease in terms of homeostasis and recovery from an illness.

*Ojas* or *Bala* assessment is an important aspect of *Ayurvedic* diagnostics as mentioned in *Charaka Samhita* which is done with the purpose of determining the distress bearing capacity of an individual and resilience towards the homeostatic disturbing factors. This is also important to decide the strength of the therapeutic intervention required for a particular person as mentioned in *Charaka Vimana Sthana*: This is a 10 factor assessment [14]:

- *Prakruti*: (Physico-psychological temperament)
- *Vikruti*: ( Nature of the disorder with reference to *Dosha*, *Dushya*, *Hetu*, *Lakshana*, *Bala*, *Desha*, *Kala*)
- *Saara*: (Dhatu level structural and functional integrity)
- *Samhanana*: (Over all structural integrity of the body)
- *Pramana*: (Body Dimensions)
- *Satmaya*: (Dietary and lifestyle patterns)
- *Satwa*: (Psycho-cognitive and Behavioral Predispositions)
- *Aaahar Shakti*: ( Quantitative Dietetics)
- *Vyayama Shakti*: (Exercise or Physical stress tolerance)
- *Vaya*: (Age related strength and agility)

On the basis of which we can determine the health assets of an individual and ability to cope with the disease or not. In this context, *Acharya* defined *Prashasta Purusha lakshana* (healthy person) as:

सममांस प्रमाणसुतुसम संहननो नरः।  
दृढेन्द्रिय विकाराणां न बलेनाभभूयते ॥  
कषुत्पिपासातपसहःशीत व्यायामसंसहः।  
समपक्ता समजरःसममांसचयो मतः॥ (च. सू. 21/18-19) [15]

This represents a model of healthy and immune person who can bear all the physical, mental, environmental including pathogenic stress. These individuals show an optimum immune response without any distress to other tissues of the body.

*Acharya Charaka* in the context of *Vyadhi Kshamatava* clarified that bodies which have a disturbed structural and functional organization of *Dhaatu*, Obese, very lean and asthenic, weak, those who indulge in diets incompatible to their body structure, those who eat very less, those who are

psychologically labile and prone to stress are unable to resist disease or becomes diseased easily.

शरीराणचिातसिधूलान्यतकिशान्यनविषिटमांसशोणतिस्थीनी  
दुर्बलान्यसात्मयाहारोपचिातान्यल्पाहाराण्यल्पसत्वानिचि  
भवन्त्यव्याधिसिहानि (च. सू. 728/7, चक्र. पाणि) [16]

This reference is very helpful in designing the personalized treatment protocols of immune enhancement in different individuals with different risk factor of the immuno deficiency.

Therefore, before administering any immune-enhancing or strengthening treatment, it is imperative to understand who needs what, where is the locus of the diminution, which *Dhatu sarta* is affected by the diseases. In order to understand the dynamics *Ojas* with respect to health and disease it is important to understand its formation in the body.

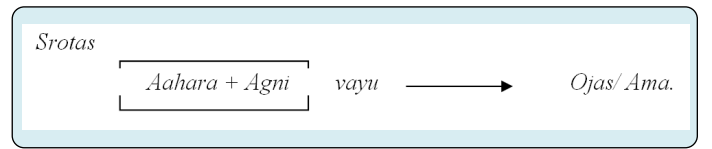
### Ojas formation in the body

*Ojas* is referred to as '*Parma saara of Dhatus*', which themselves are product of *Aahara* (nutrition) as rightly pointed out by *Sushruta Samhita*, "प्राणनिं पुनर्मूलाहारो बलवर्णौजसां च" (सु सू. 46/3) [16]. In all living being, life depends upon *Aahara* (Food and nutrition) and its maintenance and sustenance depends upon the derivatives of *Ojas* which are manifested as *Bala* (Strength and agility) and *Varna* (Shape and complexion). It is important to understand the mechanism of the transformation of food to *Ojas* and various other factors which aid in this process. As elaborated in *Charaka Samhita*:

“वधिमिशतिं पीतं लीडं खदतिं जन्तोरहतिमन्तरग्नसिन्धु  
क्षतिबलेन यथास्वेनोष्मणा सम्यगवपिच्यमानं कालवद  
अवस्थति सर्व धातुपाकमनुपहतसर्व धातुषममारुत स्रोतःकेवलं  
शरीरमुपचयबलवर्णसुखायुषा योजयति शरीर धातूनउर्जयति च,  
धातवो ही धातवाहारःप्रकृतमिनुवर्तन्ते” (च. सू. 28/3) [17]

People across the globe eat different varieties of food, all these foods when digested by the action of *Jathragni*, the *Panch Mahabhuta* from different foods depending upon their constitution of food, are released and then assimilated by the action of *Bhutagni* and *Dhatwagni* into different types of the *Dhatu*. This whole transformation process takes place in *Srotasa* (*Annavaaha, Dhatuvaha, Updhatu vaha and Malavaha*) which should be healthy, non-vitiated by any *Dosha* or *Mala*. *Vayu* which transports the products of one *Paka* to the successive *Paka* state in different *srotasa* must be in physiological state (*Prakruta*) and importantly the transforming agent state i.e. *Agni* at all the levels *Jathragni, Bhutagni* and *Dhatwagni* must be in the state of normalcy. This process of bio transformation process is time dependent process. The product of *Aahara* so formed is called *Ojas*

which help in the nourishment of the body increase its strength, agility, maintain proper structure and function of the body components leading to total health. If any of the above mentioned factors is *vitiated* or disorganized the process of formation of '*Ojas*' is hampered and the product which so formed remains under- transformed (incompletely metabolized) leading to the formation of '*Ama*' an opposite of *Ojas*. Unlike *Ojas* it leads to the decrease in the strength, agility, and cause structural and functional disorders of the components of body leading to the disease and disorders. Hence, the *Prasada* (*quintessence*) of *Dhatu paka* is *Ojas* or immunity while the under-processed product of *Dhatu paka* is *Ama* which provide the inflammatory milieu for the infections, inflammations and auto-immune disorders to flourish in the body:



It is *Samayoga* of all the above factors i.e. *Aahara, Agni, Srotas, Vayu, Kala* to help the body generate *Ojas*. Diseases are caused due to *Vishamayoga* (*Heena, Mithya, Ati*) of these factors. Hence, it is important to conserve this *Samyoga* to promote health and prevent disease. In maintaining this *Samyoga*, *Agni* plays an important role as it solely can neutralize the ills of the other factors and if it is in a good state it can lead to the formation of *Ojas*. As rightly pointed in *Grahni Dosha Chikitsa* by *Acharya Charaka*:

आयुवर्णो बलं स्वास्थ्यमुत्साहोपचयौ प्रभा ।  
ओजस्तेजोग्नयःप्राणाश्चोक्ता देहाग्नहितुकाः ।  
यदन्नं देहधातवो जौ बलवर्णार्दा पोषकम् ।  
तत्राग्नहितुराहारान्न ह्यपक्वाद्दरसादयः । (च. चि. 15/3-5) [18]

This highlights the importance of *Agni* in *Ojas* formation and it undermines the importance of *Dravya* i.e. *Aahara or Aushadha* in the *Ojas* formation when the transforming agent is not in right condition. This sutra highlights that overuse of a lot of commercial products for improving immunity or *Ojas* without any consideration for the condition of *Agni* in the individual, is the mismanagement of immunity related disorder. This is an important practice pearl hidden in the classical text. Hence it is important to maintain an optimum state of *Agni* in the body to enhance the immunity.

In modern immunology practice, the higher emphasis is given on various macronutrients, probiotics, vitamins for immunomodulation considering their individual effects on different types of immune cells like arginine is essential for the generation of nitric oxide by macrophages and the micronutrients Vitamin A and Zinc regulate cell division and so are prescribed as essential for the successful proliferative response within the immune system. However,

new studies are emerging which are cautioning against the excessive and irrational use of these immune-modulators as these can impair immune system in long run. Modern day immunology also contends that food itself can be an antigenic stimulus for the immune response on the body and Gut Associated Lymphoid tissue associated with the Payer's patches in small intestines can help in moderating the immune response by signaling mechanism between Gut and systemic immune system [19]. This validates the *Ayurvedic* conceptual framework of *Agni* modulation described above and regulation of *Ojas*. Therefore maintaining a Gut health by choice of right kind of foods qualitatively and quantitatively with proper care of *Agni* can lead to holistic health. As food and *agni* can create a milieu for healthy immune responses independent upon extrinsic medications. Optimal *Agni* is a surety to proper digestion, absorption and assimilation of the nutrients to generate an optimal immune response in the form of immunoglobulins, antibodies and other immuno molecules required.

### Practice Aspect

Nutritional Basis of *Ojas* formation *Acharya Charaka* highlighted the use of following to strengthen the nutritional base of *Ojas* formation

तन्महत ता महामूलासतचचौजःपरकिषति।  
परहिरया वशिषेण मनसो दुखःहेतवः॥  
हृदयं यत स्यादयदौजस्यं स्रोतसां यत प्रसादनं।  
तत्तत सेव्यं प्रयत्नेन प्रशमो ज्ञानमेव च॥ (च. सू. 30/13-14)  
[20]

In order to strengthen, nutritional basis of *Ojas* formation, one should avoid psychological afflictions, stress and indulge in interesting and intriguing foods which enhance the qualities of *Ojas* or have qualities similar to *Ojas* yet such food substances must not affect the transportation function of substances by obstructing the channels. This *principle* points towards use of food substances which gets properly digested and assimilated by *Agni* into *Ojas* are called *Ojasya Dravya*. Therefore, in order to understand the dynamics of *Ojasya Dravya* one must have a knowledge about the properties of *Ojasya Dravya*, *Charka Samhita* enumerate ten qualities of *Ojas* which gives a clue to identify *Aahara Dravya* enhancing the qualities of *Ojas* but with the proper consideration of *Agni*.

ओज गुणाःगुरु शीतं मृदु शलक्षणं बहलं मधुरं स्थरिं।  
प्रसन्नं पचिच्छलिं स्नग्धिमाजो दशगुणं स्मृतं ॥ (च. चि. 24/14)  
[21]

**Milk:** It is due to the *Guna Samanaya* of the milk and the *Ojas guna*, milk increases the *Ojas* and it is enumerated as one of the best *Jeevaneeya, Rasayana*.(ch. Su.27/ 217)

**Ghee:** *Ojas vardhaka* is mentioned in its qualities. (ch. Su.27/ 217)

**Nitya sevaneeya Dravya:** *Shashtika Rice, Shaali Rice, Mudga, Saindhav, Amalaki, Rain water, Milk, Ghee and Meat* broths of the animals living in dry (*Jangala*) areas, Honey and Ghee are some of the dietary components which must be included in diet as *Charaka* described these as health promoting (सुवस्थानुवृत्तकिर) and disease preventing foods (अजातानां वकिराणां अनुत्पत्तकिर).

*Acharya Sushruta* in the context of *Hitamahitamadhyaya* enlisted a number of food items from different *Ahara varga* and *Drava Varga* to be included in the diet. Immuno nutrition is an emerging discipline which is based on the effect of specific nutrients on the functions of immune cells especially in order to modify them in certain clinical condition like chronic inflammation, auto-immunity and cancers [18]. *Ayurveda* with its great repository of food items and traditional wisdom of food processing can enter into this arena to strengthen the immunity of those who are immune compromised and suffering from Cancer, leaky gut syndrome, food hypersensitivities and intolerances, allergies etc. Modern immuno-nutrition is individualistic and based on the individual micronutrient's effect on immune system, *Ayurveda* can use its holistic approach of nutrition to maximize the benefit. Various probiotic and pre-biotic components like non-digestible oligosaccharides such as fructo-oligosaccharides and galacto-oligosaccharides are distributed in various *Ahara varga dravya* which are consumed on daily basis can be employed to alter the gut microbiome and modulate the immune function or status of *Ojas* in the body [22].

*Aahara Vidhi* plays an important role in optimizing the transformation of food into the *Ojas* by modulating the digestion of the food as described by *Charaka* in *Vimana sthaana*:

“न च केवलं मात्रावत्तवादेवाहारस्यफलसौष्ठवंमवाप्तुं शक्यं प्रकृत्यादीनामष्टानामाहारवधिविशिषायतनानां प्रवभिक्तफलत्वात्” (च. व. 2/4) [23]

This reference from *Charaka* clarifies the role of *Aaharavidhi* in the conversion of food to *Ojas* through the formation of *Aahara rasa*. The same mechanism is highlighted by *Acharya Sushruta* and enlisted factors which may disrupt the process of bio-transformation of food to *Ojas* and may lead to *Ama* which include excessive liquid intake after meals, in congenial eating habits, suppression of the natural urges, sleep disruptions, psychological and emotional stress may promote the mal digestion of the food leading to incomplete bio transformation of food promoting *Ama* formation, which is the substratum for all the human dysfunctions and disorders [24].

To summarize, Food is considered as *Maha Bhesajya* in *Kashyapa Samhita*. Foods with specialized immunomodulatory qualities as described to have *Ojasya qualities*, *Pathya*, *Swastha anuvruttikara* must be used for strengthening the immunity of individuals by calibrating the other factors like *Desha*, *Kala*, *Agni*, *Satmya*, Nature of the food etc following the appropriate *Aahara vidhi*, rules of wholesome eating. This is why food is referred to as one of the main sub-pillar of (*Trayopstambha*) of the healthy living.

### Genetic and Epigenetic Basis of Ojas

Only healthy parents can give birth to the healthy offspring, healthy gametogenesis is also affected by the immune status of the potential parents. It is therefore important to enhance *Kalaja* and *Yuktikruta Bala* of the potential parents for production of healthy gametes leading to *Shreyashi Praja* or Healthy Progeny. Significance of healthy gametes by process of *Shodhna* was so profound in the earlier eras, that a chapter named as "*Shukra Shonit Shuddhi*" was dedicated to this process to eradicate *Shukra dosha*, *Artava Dosha* and *Yoni Vyapad* to increase the chances of conception, continuation of pregnancy till the healthy parturition, as a part of pre-natal care. We know that fertilization and placental formation involve immune responses. Hence it can be said that an optimal immunity affects the pregnancy and human reproduction also [25].

### 'Ojas' and Innate Immunity

'Ojas' is described as the first formative structural and functional element of the body which gets manifested after the fertilization and *Jeevavkramana* when human body is in the form of *Kalala* [26]. It is the first deciding factor for the continuation of life in- utero. It is 'Ojas' which is at the base of human development including organogenesis in utero, as rightly highlighted in *Ashtanga Hrudaya*:

“यन्नाशे नयितं नाशो यस्मसितषठततिषिठते। नषिपद्यन्ते यतो भावा  
वविधि देह संश्रया। (अ. ह. सू. 37-38).

In utero development is the time when various maternal and paternal genetic factors starts expressing leading to formation of cells, tissues and organs. If condition of 'Ojas' at this time remains good (*Samayoga*) it leads to structurally and functionally normal growth and development, if 'Ama' is present at this crucial time it may affect the growth, development and differentiation of cells leading to malformations, even abortions. Innate immunity can be viewed as comprising four types of defensive barriers anatomic, skin and mucuous membranes, physiological temperature, low pH and chemical mediators, endocytic and phagocytic and inflammatory cells [27]. Organogenesis involves the complex chromosomal expression which can affect the development of

these mechanisms of immune system. Hence, we can say that *Ojas* is the basis of the establishment of the immune system in the human body. This is therefore called *Sahaja Bala*. Its deficiency in utero may lead to various *Sahaja* disorders like *Arsha*, *Prameha*, *Kushtha*, Diabetes type 1, Grave's disease, Primary immunodeficiency and various other auto-immune disorders, Chromosomal aberrations are also the some of the manifestations of In-utero *Ojo Kshaya*. Many of these diseases also enhance the susceptibility of an individual to infections, allergies and chronic inflammation [28]. Hence, *Ojas* can play a very important part in immune regulation of the body by affecting the growth and development of Immune system tissues organs in-utero. *Bala Vruddhikara Bhava*, mentioned in *Charaka Samhita* is a cluster of factors which affects *Shahaj Bala*, the innate or inherent resistance to disease and disorder: Genetic factors (बलवत पुरुष देशे च जन्मः), Geographic and temporal factors (बलवत पुरुष काले च जन्मः), Maturity at the time of birth and maturity of the parents (सुखश्च कालयोगः), Epigenetic factors (बीजकर्षत्रगुणः, Paternal and Maternal, Gamete factors and Utero-placental factors), Nutritional factors (आहार संपत्त), Adaptive factors (सात्म्य संपत्त), Psychological factors (सत्त्व संपत्त). All these factors decide the origin of 'Ojas' in an in-utero individual which is carried forward in the human body in the postnatal period and many of the above factors along with *Aahara*, *Agni* and *Aahara vidhi* factors described above maintains and sustain *Ojas* in a body.

### Practice Aspect: Genetic and Epigenetic Basis of Ojas

With various environmental, cultural and lifestyle transitions, there is an alarming increase in the fetal malformations, recurrent pregnancy loss, reproductive wastage, neural tube defects, and chromosomal abnormalities. According to an estimate, an approximate of 21,400 children with Down syndrome, 9000 with beta-thalassaemia and 5200 with sickle cell disease are born in India every year [29]. A defective *Sahaja Bala* or *Ojas* can be attributed to this raise in number. *Ayurveda* can play a major role in optimizing the reproductive outcomes by manipulating the *Ojas* or *Sahaja Bala*. *Ayurveda* offers a complete range of *Ojas* enhancing therapeutic modalities form pregnancy planning to parturition and maximize the healthy reproductive outcomes in terms of *Shreyasi Praja* (Optimum reproductive outcome). It includes the selection of the mate on various attributes which are desirable in one's progeny, eliminative therapy (*shodhan chikitsa*) to cleanse the body and promotion of healthy gamete formation in both the potential parents, which is followed by *Samsarjan Krama* (Dietary Therapy). Only then mating for pregnancy is allowed. *Rajaswala Charya*, *Ritumati Charya* are two lifestyle disciplining approaches which help in optimizing the *Dhatu samya* and help in *Beeja and Kshetra Shuddhi* for



enhancing *Beeja Kshetra Sampata*. Planned pregnancy at right time i.e. *Garbhaadhaana samskar* is also an important immunity modulator. Once the woman conceives, there are many factors enlisted as *Garbhopghaatkar Bhava* to be avoided by the pregnant woman. From critical appraisal of all these *Bhava* it is observed that all these factors cause damage to the vital link between mother and fetus and decrease the *Ojas* in the conceptus leading to the abortion. If pregnancy continued the conceptus may have some kind of structural or functional compromise. *Garbhini charya* is meant to enhance the *Ojas* in both the *Garbha* and *Garbhini*. As marked by *Acharya Sushruta*, “हरदयं द्रव मधुरप्रायं सनर्गिधं दीपनीयं संस्कृतं च भोजनं भोज्येत, सामान्यमेतदाप्रसवात्” (सु. शा. 10/3) [30]. *Hrudya* here implies *Ojasya dravya*. A view of the *Garbhini Pricharya* which is mostly based on milk, butter, ghee, indicates that it is to enrich nutritional resources of the mother for the healthy fetal development. As milk has all the properties of *Ojas* it directly increases the *Ojas* of *Garbha* and *Garbhini*. A well complied *Garbhini paricharya* leads to the enhanced disease resistance in the offspring without much pregnancy related complications for the mother. In this continuum of care, *Prasava Paricharya* and *Sutika Paricharya* and *Dhatri paricharya* is entailed to enhance the *Ojas* of the offspring and enhance the resistance of the mother towards the intra-natal and post-natal complications when her body is already depleted by the burden of pregnancy. This regulated dietary and lifestyle intervention to optimize the fetal nutrition forms the basis of increasing the *Sahaj Bala* of the fetus and ensuring fetal health, the first step towards the Immunity enhancement. Therefore, pregnant women should be targeted with this Immunity enhancement approach of *Ayurved* during peri-conceptual and ante natal care period.

*Garbh-Garbhini Samskara* to produce healthy generations which will decrease the overall burden of various diseases, by increasing the *Sahaja Bala* of the fetus and *Yuktikruta Bala* of the mother. This can also go a long way to reduce the Infant and maternal mortality rate by reducing the stress of reproduction.

### Disorders of *Ojas* or *Bala Ojo Dosha*

As described in *Shushruta Ojas* or disease resistance is disrupted by Injury, trauma, Generalized debility or depletion caused by various disorders or malnutrition, metabolic disorders, psychological affliction of grief, anxiety and worry, hard physical stress and lack of food all cause the disorders of *Ojas*. As *Ojas* which has seat in the heart gets depleted in levels and due to the excessive agni but no substrate to metabolize it gets diminished from the body [31].

In the context of *Rasyana*, *Acharya Charka* beautifully explained the etiology of *Oja Kshaya* which are attributed to *Gramya Aahara* (Organized and settled life, urbanized) or

life style indiscretions with various psychological afflictions lead to the weakening of *Dhatu*s and *srotas* carrying these *dhatu*s which finally converge to cause *Ojas Kshaya* and manifesting into *Lakshana* of *Dhatu Vaishmaya* or different disorders [32]. *Charaka Samhita* in the context of *Oja Kshaya* enumerated excessive exertion or athletic activity coupled with *Anashana* (lack of food), Worry or mental stress, Dry, light and nutrient deficient diets in very less quantity (Strict dieting), environmental factors (Dry tropical climate with high temperature exposure), Phobia or anxiety, depression, excessive alcoholism, late night shifts or lack of sleep, excessive drainage of body fluids in the form of *Kapha*, *Rakta*, *Feces*, *Urine*, enteral secretions, age related degeneration in immune function and infections and worm infestations are some of the common causes of *Oja Kshaya* which require a therapeutic interventions.

Current medical research literature defines immunodeficiency disorders as diseases caused by one or more defects of the immune system, leading to increased susceptibility to infections. It is a group of heterogeneous disorders with immune system abnormalities characterized by various combinations of recurrent infections, auto-immunity, lympho-proliferations, granulomatous processes, atopy and malignancy. Most of the primary immunodeficiency are genetic in nature (*Beeja Dushti Janya*). Secondary immune deficiency are caused by Age factors, pre-maturity and age related changes, medications like immunosuppressants, corticosteroids, Procedures like use of anesthesia, splnectomy, infections like HIV, AIDS, temporary during infections, metabolic disorders like Diabetes, uremia, Protein losing conditions like Nephrotic syndrome, Protein losing enteropathy, Alcoholic cirrhosis, Hereditary conditions like chromosomal abnormalities. Miscellaneous like SLE, Burns, malignancies and radiation therapy [30]. Therefore, *Ojo Kshaya* is requires some kind of *Ojo therapeutic* modality for the re-establishment of the equilibrium.

### Signs of *Ojo Kshaya* in Ayurveda

Physical and psychological weakness, sense of illness, excessively worried, defective functioning of sensory motor and cognitive apparatus, change in complexion, appearance and voice, loss of weight and hyper asthenia are some of the signs of the *Ojas Kshaya* mentioned in *Charaka Samhita*. *Moorchha* i.e. altered state of consciousness, *Moha* i.e. Delirium, Altered sensorium *Pralapa* which indicate CNS failure leading to death, are the signs of *Ojo Kshaya* mentioned by *Sushruta* [33]. There are many disorders in which *Ojo Kshaya* is one of the manifestation of the disorder like *Pandu*, *Hrud Roga*, *Kshaya* and *Urakshat*, *Madatayya*, *Sannipata Jwara* labelled as *Hatoujus* (हतौजस) by *Acharya Sushruta*. Non communicable diseases presents a higher risk of the opportunistic infections owing to the depleted

*Ojas* or immune response and grossly vitiated *Dosha Dhatu Agni Balance* e.g. Diabetes is linked with TB [34], TB and Chronic obstructive pulmonary disease these two also co-exist and can increase the morbidity and mortality. Persons with COPD have been found in one study to have a two to threefold higher risk of developing TB. Likewise, malaria can lead to the end stage renal diseases [35]. This indicate that non-communicable can enhance the risk of communicable diseases, due to the depletion of *Ojas*. This area can provide a playing field for *Ayurveda* to decrease the double burden of the disease or *Nidanarthkara* diseases to emerge as a world leader to reduce the epidemiological transition.

### Ojas and Shodhna Therapy

*Ama*, as explained above, is product of the incomplete bio-transformation which grossly vitiates *Dosha, Srotas and Dhatu*. It is therefore highly important that body should be cleansed deeply at regular intervals to get rid of *Ama*. As put forward by *Acharya Charaka*: मलापहं रोगहरं बलवर्ण प्रसादनं। पीत्वा संशोधनं सम्यगायुषा युज्यते चरिम।। (च. सू. 15/22) [36]. Therefore, it is important to expel out the accumulated mala and vitiated dosha from the body periodically. As these provide an environment for the proliferation of the pathogens and compromise the immunity. *Rasayana* are indicated the first line immune-enhancement therapy but for *rasayana* to work better eliminative therapies are the pre-requisite. As mentioned in the above quote that *Shodhna* or eliminative therapies strengthens the *Bala* of the body.

### Rasayana Therapy and Immunotherapeutics

There are two types of therapeutic approaches described in *Charaka Samhita*:

- Swastha urjaskara- Health and Immuno enhancement approach
- Rognuta - Disorder or Disease mitigation approach.

*Rasayana* therapy is one of the therapeutic modality of the former i.e. *Swastha urjaskara*. *Swastha Urjaskara* is elaborated by *Acharaya Chakrapani* in his commentary that: "Those therapeutic modalities which when used by an individual corrects the deficient state at *Dhatu level* caused by age related degeneration or day to day oxidative stress related diminution. These modalities restores and replenish the healthy state of the *Dhatu* are called *Swastha Urjaskara*" From this definition, *Rasayana* is seen as all those diets and medicine which promote the production of *Sama Dhatu* are called *Rasayana*, it depicts the optimum assimilation of nutrients to form structurally and functionally efficient *Dhatu*., *Acharya Charaka* elaborated that longevity, memory, intelligence and cognitive sharpness, health, regeneration of the age related changes, enhancement of the complexion, voice, physical, sensory and psychic strength are the some

of the few health benefits of the *Rasayana* treatment as it enhances the quality of the *Rasadi Dhatu* finally culminating into *Ojas*. Therefore, any food, thought, action or drug which promotes the formation of quality *Dhatu*s leading to formation of *Ojas* are all included under the purview of *Rasayana*. *Rasayana* is immuno-enhancement therapy of *Ayurveda*. There are four sub-chapters in *Charaka Samhita* which are dedicated to this discipline. Many *Rasayana* recipes are also elaborated, the *Rasayana* combinations mentioned in *Rasayana Pada* have *Bala Karama*, *Ojaskaram* mentioned in their *Phala shruti viz. Chawyan prasha, Brahm Rasayana, Medhya Rasayana, Pippali Rasayana, Shilajatu and Bhallataka Kalpa. Chawyan prasha* for instance, is one of the most extensively studied *Rasayana Kalpa* is noted to have polyphenolics, including flavonoids, which exhibits evident antioxidant and free radical scavenging activity, enhances the immune system, and fights infections, due to the high content of *Amla* in it. In a 6-month-long randomized, open labeled, prospective, multicenter, clinical study in children (5–12 years), CP was shown to lead to significant improvement in immunity, energy levels, physical strength, vigor, and quality of life assessed through KIDSCREEN QOL-27 questionnaires in children [37]. *Rasayana* on the basis of their procedural intricacy divided into two:

- To replenish the day to day wear and tear i.e. degeneration of tissues are called *Vata Aatapik Rasayana* (वातातपकि रसायन). Their use does not require any strict discipline of the diet and medication. These are further divided into two categories based upon the purpose of their use:
- *Ajasrika* (Daily consumable): These comprise of diets and drugs with the *Ojasya* properties like *Ksheer Ghruta, Mamsa rasa* and *Nitya seevaneeya foods*.
- *Naimittika* (Disorder specific): These comprise of the specific *kalpa* made up of the *rasayana dravya* to target a specific *Dosha- Dushya Samprapti* to enhance the strength of the tissue and increase the disease resistance thereby mitigating the deleterious effects of the pathogenetic process. *Triphala Rasayana, Agastya Haritaki, Yogaraja Rasayana, Shilajatu Rasayana, Gud sarpi* etc are the examples of the above.
- To acquire long term health outcome in terms of disease eradication and disease resistance an individual is subject to the rigorously controlled life in a confinement called *Kuti Praveshika Rasayana* where he/she required to follow the *Panchkarma* therapy followed by *Rasayana* therapy which was popularly known as *Kaya Kalpa*.

The main objective behind all these procedures is to enhance the strength of the tissues and to counter *Balance* the degenerative effects of diseases disorders on them and replenish them with the optimum nutrition.

Since centuries plants have been employed for health enhancement, current pharmacological research also proved immune-modulator functions of a large number of plants

many of them are mentioned as *Rasayana* in *Ayurveda*. Plants are the repositories of various phytochemicals which by virtue of their pharmacological action influence the functions of immune system by phagocytosis stimulation, macrophage activation, immune-stimulatory on peritoneal macrophages, lymphoid tissue stimulation, cellular immune function enhancement and non-specific cellular immune system effect, antigen specific immunoglobulin production increase, increased non specific immunity mediators and natural killer cell numbers reducing chemotherapy induced leukopenia and increasing circulating total White cell counts and interleukin-2 levels. Therefore, immune-modulation through the stimulatory or suppressive activity on particular immune cells may help in health promotion and disease mitigation. There are some agents in the form of phytochemicals which activate host defense mechanism thereby leveraging the impaired immune response in immune-compromised people. These agents have a great potential to be utilized as supportive therapy to conventional chemotherapy. Current pharmacological studies also testify the rejuvenating properties of *Rasayana Dravya*, many of the rasanaya dravya possess strong anti-oxidative properties, and are noted to be potent immunostimulant, immune adjuvant and immune-suppressant activities [38].

### Behavioural Medicine and Ojas

*Acharya Sushruta* described four disease mitigation approaches referred to as: *Samshodhana* (Eliminative therapies), *Samshamana* (Health establishing medical approaches), *Aahara* (Therapeutic and restorative Dietetics) and *Aachara* (Health Behavioural). Behavioral approach includes the physical, mental and cognitive behaviors which are conducive to one's own health and other's too. Behavioral and cognitive states are elucidated to have modulate the equilibrium of *Dosha*, *Dhatu* and *Mala*. As *Acharaya Sushruta* described defined sensory-mental and cognitive dimension of health: परसन्नातमैदरयि मनः स्वस्थ इत्यभिधीयते. In terms of *Ojas*, *Acharya Charaka* enlisted psycho-behavioral factors as *Ojasya viz.* To avoid mental stressors and to engage meaningfully in activities enhancing mental peace as well as wisdom [39]. Based on this, *Achara Rasayana* (Behavioral Rejuvenation) and *Sadvruta* (Health promoting behaviors) have been highlighted in the classical treatise. The ultimate goal of the above two is to modulate the immunity by decreasing the exposure of an individual to the immuno-stressor agent, physical, mental and cognitive. Idea of behavioral rejuvenation is based on to promote the psychological attributes which decrease the cognitive fallacies pertaining to health related decision making (*Prajnapradha*) and to promote making healthy choices. As all our behaviors affect our health therefore, these psychological attributes affect our thoughts which brings about changes in physical behavior. Physical behaviors

directly affect *Tridosha*, *Dhatu*, *Agni* leading to formation of *Ojas*. Benefits of *Acharaya Rasayana* by *Acharya Charaka* can be summarized as: All the behavioural and psychological elements of *Achara Rasayana* brings the same transformation in the body frame as is the brought about by regular use of *Rasayana* medicine [40]. *Acharya Sushruta* also highlighted the importance of Behavioural elements in promoting health, rational eating (भोजनं जीरणे), timely attention towards the eliminatory reflexes (वेगानां चावधारणं), non-attached attitudes towards life (ब्रह्मचर्य), non-violence (अहिंसा), avoidance of the risky behaviors (साहसानां च वर्जनम्). These elements help in enhancing resistance against various intrinsic as well as extrinsic disorders and keep the body resilient against the stress of the disease. Therefore, *Achara Rasayana* and *Sadvruta* affect two folds, it decreases the *hetu Bala* on one hand and *Vyadhi Kshamatava* on the other hand. This also represents the patient compliance and readiness to maintain the health equilibrium. *Ayurveda* emphasize. *Achara Rasayana* and *Sadvruta* is represented as the preventive and promotive approach which enhance the *Bala* and help individuals to avoid *Prajna apradhanya vyadhi*. All the behavioural elements of *Dincharya*, *Ritu charya*, *Garbhini Paricharya*, *Rajaswala Paricharya*, *Sutika Paricharya*, *Dhatri Paricharya* comes under the purview of *Sadvruta* to enhance the healing process and to avoid the onset of diseases (*Vikaranam anutpatti*). In prevalent times, the measures of social distancing, personal and respiratory hygiene are the hygiene practices mentioned in classical texts to avoid emergence of many infectious diseases.

परसंगाद्गात्रसंस्पर्शान्निवासात् सहभोजनात् ।  
सहशय्यासनाच्चापि विसृज्यमानुषानुलेपनात् ।।  
औपसर्गकिरोगाश्च संक्रामन्तानिरान्तरम् ।। (सु. नि.)

Similarly, *Acharya Charaka* has mentioned many personal hygiene measures with their beneficial effects on health:

- द्वौ कालावुपस्पृशेत- Taking shower twice a day, morning and evening.
- मलायनेष्वभौक्षणं पादयोश्च वैमल्यादध्यात - Hand and foot hygiene
- त्र्यपिक्षस्य केशश्मश्रुलोमनखात् - Hair hygiene
- नतियमनुपहत वासाः- Clothing Hygiene
- सुमनाः सुगंधि - Use of natural product based toiletries, hygiene and perfumed products for stimulation of the brain and mind
- मूर्धश्रोत्रघ्राणपादतैल नतियः - Oiling of the apertures of the body with head and scalp and feet to enhance the strength and to control the entry of dust, fomites deeper into the body.

Hence, the physical, mental, social and moral conduct of an individual can lead to better health outcomes. Every *rasayana* and *shodhana* therapy requires a lot patient

compliance and disciplining which can only be achieved by Sadvrutta.

## Discussion

The modern approach to immunity and Immunology is very complex and comprise of a complex computational biology approach of proteomics, transcriptomics and bioinformatics [22]. However, *Ayurveda* adopts a simplistic model of *Ojas* (*Vyadhi Kshamatav* or *Bala*) as the homeostatic model of immunity which is based on the idea that immunity is built upon the structural and functional components we inherit genetically from the parents. In post-natal life, it is sustained and maintained by the diet, life style and psychological attributes which create a milieu (epigenetic environment) in which healthy body components and constituents are formed. A well coordinated function of these body components and constituents makes body disease resistant and resilient making recovery from a disorder easy. *Bala* or *Ojas* reflects the *Swabhavoparamvada* principle:

जायन्ते हेतुवैषम्यादवषिमा देह धातवः  
हेतुसातम्यात समास्तेषां स्वभावोपरमःसदा॥ (च.सू. 16/27) [41]

This principle also emphasize the creation of *Dhatu Satmya* by adopting health promotion of factors which leads to the disruption of the chain reaction of pathogenesis leading to recovery or disease mitigation. This principle is the model of Immunity and forms the premise of every therapeutic approach in *Ayurvedic* management of a disease. This generic approach is applied in every disease in contrast to the highly specific approach of conventional immunology which focus upon the activities of particular immune cells in different diseases and disorders and target treatment either on the suppression or proliferation of these cells without considering the effects other systems.

*Sahaja*, *Kalaja* and *Yukti Kruta Bala* should be enhanced. *Sahaja* as described above the congenital or innate immune strength which can be enhanced by *Garbhadhana Vidhi*, *Garbhini Paricharya*. *Kalaja* is also innate immunity which manifest temporally as the disease resistance in *Visarga Kala*, *Yuvana awastha* is superior to that of the *Adana Kala* or *Vruddha Awastha*. This disease resistance can further be enhanced by following *Dincharya*, *Ritucharya*, *Ahara Vidhi Palana*, *Ritu Shodhana*, *Rasayana* and *Vajikarana Upyoga* to counter the day to day *Dosha Dhatu Mala* vitiation and to replenish the day to day wear and tear caused by the *Dhatu Parinama*. This approach of immune strengthening is referred to as *Ajatanaama vikaranama Anutpattikara Bhava*. Third is clinically very important and transcend between *Kalaja* and *Yuktikruta* and it includes special diets, drugs, physical activity aimed to address particular vitiation in the body and increasing the immunity as per the *samprapti* of the

*Ojas Kshaya*. Many therapeutics are based on the *Yuktikruta Bala* like use of *Raja Yapana Basti*, *Mamsa Prayoga*, *Vaya sthapana Basti*, *Guda Sarpi*, *Agastya Rasayana*, *Kamsa Haritaki*, *Kashyapokta Rasayana Kalpa*, *Shilajatwadi Kalpa* etc. are the examples of *Yukti Kruta Bala*. The purpose of *Yukti Kruta Bala* is to enhance the adaptive immune response and it is usually began after the eliminative therapy and associated with a lot of life disciplining and *Achara Rasayana*. This represents the planned and focused approach targeting a particular pathogenetic phenomenon or *Kshaya* or *Vruddhi* state. Neutralizing the etio-pathogenetic factors with the salutogenic factors is the essence of immune-enhancement through *Ayurveda*, which is sequential and systematic as described above.

From our review of articles on various research portals, 15 articles can be found by key word '*Ojas*' at Dhara platform most of the articles contends that *Ojas* is the vital energy and *Prana shakti*, immunity and disease resistance. *Guduchi*, *Ashwagandha*, *Trifala* and *Amalaki* are the most widely studied *Ayurvedic* herbs and herbal compounds studied extensively for their roles in immunomodulation. There is paucity of clinical and experimental studies on the immune-modulator role of commonly prescribed herbal formulation and rationale behind their use. Most of the articles which were reviewed were review articles, one clinical study on 400 children and one animal study which showed some evidence of the immune-modulation by the use of *Ayurvedic* herbs. *Panchkarma* therapies are widely used in the management of auto-immune diseases like rheumatoid arthritis, SLE, psoriasis and immune deficiency disorders but there are no studies available to review the role of *Panchkarma* in these clinical disorders related to the immunity. There are many review studies on the role of *Rasayana therapy* on the immunity disorders and attribute the effect of *Rasayana* therapy to anti-oxidant activity of the drugs. For establishing the role of *Ayurveda* as an evidence based therapeutic modality for immune-strengthening it is therefore necessary to fill the gaps and document the role of various therapeutic modalities in immune enhancement in terms of the improvement in status of Health related quality of life parameters like the signs of *Dhatu Samya* described above and not only the molecular demonstration of immunomodulation and anti-oxidant activity. Health related quality of life parameters are multidimensional indicators related to physical, mental, emotional and social functioning which goes beyond the direct measure of health and focuses on the quality of life consequences of health status and are determinants of the immune status. There are three measures on which HRQOL is based Global health measures, measures of well being and participation measures [42]. This highlights that immune cell assays and antigen antibody titers are just one aspect of the immune disorders and cannot substitute the total health. In present day, immunology also

patient reported health related outcomes are recommended to be used for the assessment of effectiveness of therapy [43]. It is emphasized that Immunity is a long term outcome of our dietary and lifestyle activities which must be optimized by health promotion and preservation approaches of Ayurveda. The assessment of effectiveness of *Ayurvedic* modalities must be done on the basis of these parameters vis a vis disease free period following an *Ayurvedic* intervention, which is still a missing part in the whole picture.

## Conclusion

To conclude, immunity or disease resistance represents an internal milieu which is an integrative product of a healthy genetic inheritance, diet, life style and ageing. Mere use of one or two *Rasayana dravya* without considering the above factors which also determines immunity is a reductionist approach like conventional biomedical science. Immunity and disease resistance is a continuous process which requires compliance to the healthy life style approaches of *Ayurveda* mentioned in *Dincharya, RituCharya, Aharavidhi, Sadvruta, Garbhadhana vidhi, Rajaswala Paricharya, Prasav paricharya, Sutika Paricharya, Jatottar Karma, Shodhana, Rasayana* and *Vrushya prayoga*, which helps in the generation of better quality components and constituents of the body inherently disease resistant. It also helps in the replenishment of the degeneration caused by day to day wear and tear. As long standing morbidities decrease the tissue resilience and capacity to heal, following the above helps in clearing the breeding ground of the pathogens and stressors which further help in the immunity to express optimally. It may be due to the same reason that *Rasayana* is given primacy to the disorder management in *Charaka Samhita* emphasizing the role of immunity enhancement treatment over the disease mitigation treatment.

Therefore, diets, foods and actions which promote this functional and structural integrity are classified as *Urjaskara or Ojasya Dravya*. This area of *Ayurveda* is a promising area for research and practice if rationally applied. Therefore, immunity is an individual health asset which dwells upon idea of maintaining health and well being, *Ayurveda* principles of healthy living can be used to strengthen this health asset and can make India a world leader in the management of double burden of diseases especially with this approach.

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