INTEGRATING AYURVEDIC CONCEPTS OF IMMUNITY AND ITS ENHANCEMENT- A REVIEW

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ABSTRACT
The traditional Indian system of medicine and health care – Ayurveda in its fundamental holistic approach promotes to attempt towards the investigation of concepts, principles and practices for maintenance of health and cure of disease. Immunity is considered as most potent factor for health and disease in traditional as well as modern medicine. Immunomodulation is one the most potent tool maintenance of health and disease prevention. The role of immune-modulation is not yet fully perceived in modern medicine. The influence of neuro-endocrine axis, seasonal variations, psychological aspects and nutrition on and immuno-competence is mentioned in Ayurveda. The concepts of immunity and immuno-competence have been advocated as Ojas, Bala and Vyadhiksmatva in Ayurveda. The attempts has been made to comprehend the concepts of Vyadhiksmatva in elaborated manner and integrate the various practices and measures including diet and drugs to modulate immune response for enhancing and maintaining better health as advocated in ancient textual.

KEYWORDS: Ayurveda, holistic, immunity, Vyadhiksmatva.

INTRODUCTION
Human body has evolved an intricate system of defense for the protection against the environmental pathogens and other disease producing factors. Recent researches have proclaimed the role of impaired immune system as a major etiological factor for various human diseases including not just those caused by the microbes but also non-microbial diseases as cancer, allergies and auto-immune disorders. Immunity is responsible for establishing an infection-free state of the body. This homeostasis among the supporting elements of the mind and body is known as dhaatu saamya1 in Ayurveda. The immune system consists of cellular components, immunoglobulins and complements system. The proper functioning of these all is required for protection from various types of diseases. Ayurveda the science of life advocates the concept of vyadhikshamatva2 (immunity) not only for protection against diseases rather for promotion of physical and mental health.
Vyadhikshamatva means disease fighting mechanism of the body or the capability of resisting diseases. Depending on the nature of food consumed, condition of Dosas, Agni and Srotas a person may or may not be capable of resisting diseases and finally suffers from mild or severe, acute or chronic diseases. Ayurveda has laid greater emphasis on the maintenance of equilibrium state of tissue elements to achieve the two basic objectives i.e. preservation of health in healthy individual and eradication of diseases which are curable\(^3\). Person who is desirous of healthy life should adopt the beneficial practices related to diet, conduct and activities. In the view that every person has different constitution, lifestyle and eating habits, all the persons are not capable to resist the disease to the same extent and same manner\(^4\). It is clearly mentioned that a person who is having balanced proportion of muscles, compactness, firmness and excellent sensory faculties never suffers from such diseases. Such people can easily tolerate the extremes of hunger, thirst, heat of the sun, cold and physical exercises. They have balanced agni and normal metabolism.\(^5\)

**Role of rasayan therapy to improve immunity**

Promotion of health in Ayurveda is achieved by Rasayan drugs as Guduci, Ashwgandha, Silajatu, Amalaki and many more. These are being explored for their effect on immune system. Available evidence show these drugs modulate immune functions by improving antibody formation, macrophage activation and CMI suppressing effects. They can act as immunosuppressant, immune stimulant and immune adjuant. These drugs promote nutrition by direct enrichment of nutrional qualities and improving agni(digestion and metabolism).

**CONCEPT OF VYADHIKSHAMATVA**

The concept of Vyadhiksamatva (immunity) is of tremendous importance in the daily wellness of human beings; for prevention and recovery from diseases. Acharya Chakrapaani has described Vyadhi-kshamatva (Resistance to disease manifestation) in two ways\(^6\):

1. Vyadhibalavirodhitvam- Capacity of the body to fight against manifested disease.
2. Vyadyutpadapratibandhatvam - Capacity to restrain or withstand the strength (Severity) or Virulence of diseases.

According to Acharya Susruta in the context of a person with good immunity against diseases says, ‘He who consumes food which is moderate in both properties viz. unctuousness and dryness, the essence of that food gets formed in him, circulating throughout the body, nourishes all the dhatu (tissues) properly, being in their normal, the dhatu, make for medium sized body; he will be capable of performing all activities, of enduring hunger, thirst, cold, heat, breeze, rain and sunlight and will be strong.’\(^7\) Both of them together have called Immunity against
disease and resistance against death and decay. Ayurveda emphasizes the promotion of health through the strengthening of host defenses, against day-to-day physiological extremes as well as opportunistic maladies. Thus *VyadhiKshamatva* implies a resistance against the loss of the integrity, proportion, and interrelationship amongst the individual's *doshas* (bioenergies) and *dhatu* (tissues).

**CONTRIBUTING FACTORS FOR *VYADHIKKSHAMATVA***

Various factors which contribute towards *VyadhiKshamatva* are normal *Doshas*, equilibrium state of *Dhatus* (bodily tissues), normal *Agni* (digestive fire), patency of *Srotas* (micro channels) etc. Person who is possessing excellence of all *Dhatu* including mental faculties i.e. *sarva sara* are endowed with great strength, happiness and resistance to diseases. It follows then that the Ayurvedic concept of immunity is intricately interwoven with the concepts of nutrition, *Agni* (digestive fire), and tissue formation.

A synonym for *VyadhiKsamatva* which appears in the ancient texts is *bala*, generally translated as "strength" and both terms are used as synonyms.

*Tatra bala sthiropacitamamsataa sarvacestasvapratigaatah svaravarnaprasado bahyanamabhyantraranam ca karananamatmakarya pratipattirbhavati.***

There are three types of immunity (*VyaadhiKsamatva* or *Bala*) in *Ayurveda*:

1. **Sahaja**: Congenital or Natural
   
   It is an inherent characteristic property of an individual present since birth. It is because of equilibrium state of *Dosas*.

2. **Kalaja**: Time, Season, Age
   
   It is dependent on season and age. Loss of strength is observed in *Adanakala*, gaining of strength is observed in *Visarga Kala* and middle age is considered as full of strength. Certain places have stronger and healthier climatic and environmental conditions. For example, places with an abundance of water, ponds, cool and pleasant climatic conditions are *kapha*-dominating areas and contribute to stronger immunity. Also, strength is greater in the early morning, spring, and youth than in evening, summer and old age.

3. **Yuktikruta**: Acquired strength is dependent on healthy practices related to diet, activities etc.

Ayurveda focuses on three plans for acquiring or enhancing immunity:

i. Proper and suitable *Ahara* (nutritious diet)
ii. Performing exercise (*Chesta*) with proper method

iii. Using different beneficial *Rasayana Chikitsa* 

Ayurveda further advocates that those who maintain a regular, healthy routine and take wholesome food generally maintain good health. Wholesome, adequate and timely, nutrition especially in during foetal development and childhood plays an important role in developing immunity. Wholesome food in adequate amount gives us long life and youthfulness.

**CONCEPT OF OJUS IN AYURVEDA**

In Ayurveda, *Ojas* has been considered vital in the defence mechanism of the body. The essence of *saptadhatu* (saptadhatu means the seven bodily tissues as from rasa to *Shukra dhatu* e.g. rasa (plasma and lymph), *Rakta* (blood cells), *Mansa* (connective and muscular tissue), *Meda* (body fats e.g. adipose tissue), *Asthi* (bones), *Majja* (bone marrow) and *Shukra* (reproductive systems) is called *Ojas* and it is the seat for strength, hence called *bala Prakrta slesma* is termed as *Ojas* by Acharya Caraka in context of the quantity of *Ojas*, he has used the term *sleismikasya Ojasah*. Other entities like *Rasa*, *Rakta* and *Sukra* are also said to be as *Ojas*.

*Ojas* is produced and nourished from food substances, which are conductive to *Ojas*. But, the conversion of food, in spite of having all nutritive factors of *Ojas, Dhatus, Bala* and *Varma* etc. into specific metabolite depends upon the proper functioning of *Agni* i.e. both *Jatharagni* and *Dhatvagni*. Another important factor is *srotasa* i.e. internal transport system of body. The nutrient fractions, the precursors of bodily elements are recognized and they transported to the place here they are subjected to *Agnivyapara* and further transported to the seats of *sthavidhatu* where they are synthesized into final products by specific *srotasas*. Other factors like *Vayu, kleda, usma* etc. also play an important role in the process.
Pharmaco - therapeutic properties: Twenty sarira gunas\textsuperscript{22} are described in classics divided in ten pairs. Out of each one pair shows anabolic and / or anti catabolic effect on body. Ojas possesses these ten gunas on the basis of which it performs various pharmaco therapeutic actions in the body they are described as Guru, Sita, Mrdu, Slaksna, Sthira, Snigdha, Picchila, Bahala, and Manda\textsuperscript{23}.

**Function of Ojas:**

Ojas plays a vital role in all three stages of life i.e. Utpatti, Sthiti and Pralaya\textsuperscript{24}.

**A. IN UTPATTI:**

- In Fertilization
- In growth and development of Garbha
- In viability or Non viability of Foetus.

In **Fertilization** Ojas is said to be present in the sperm and ovum in the form of their Sara or essence\textsuperscript{25}, in the absence of which, fertilization does not take place\textsuperscript{26}.

In **growth and development of Garbha:** After fertilization Sara of Sukra and Sonita get converted in to a new substance, which is said to be garbharasdrasah it is the only source of nutrition of garbha for its growth and development\textsuperscript{27}.

In **Viability or non-viability of Foetus:** In eight month of pregnancy Ojas becomes transplacentally circulating entity. If the foetus gets delivered in this month, in the state when Ojas is in maternal body, it does not survive being devoid of Ojas\textsuperscript{28}.

**B. IN STHITI AVASTHA:**

i. In Maintaince of health: Dosa, Dhatu and Mala are the fundamental units of the body, among there, Dosas are said to sustain the body in their normal state. But these Dosas even in their physiological state of equilibrium can not sustain body which is devoid of Ojas\textsuperscript{29}. It is also said that all the activities of the living body may it be Kayika, vacika, mansika take place smoothly if it is contained with Ojas\textsuperscript{30}. This it can be inferred that Ojas influence the function of physical, sensory, psychic and other higher faculties of the body and maintain the homeostatic condition of body.

ii. As a preventive measure: The word Bala used as the synonym of Ojas by Susruta is because of the cause and effect relationship existing between Ojas and Bala and hence the term Bala in any context represent the status of Ojas. Vyadhipratikar sakti depends upon the Bala hence it is not only responsible entity for vyadhiutpada pratibandhakara but also for vyadhibalavirodhilwa. Types:

- **Para ojas:** This is astabindu in quantity, if decreases then person will die.
Apara ojas: which is ardhanjali ojas, if decreases or vitiated manifest abnormalities. It is snigdha (essence) and somatmaka (mild and cool) in nature. Though predominately white in color, has got some yellowish & whitish tinge. Ten great blood vessels connected to heart carry the Rasatmaka Ojas, on which the whole\textsuperscript{31}.

**OJAKSAYA DEFINITION:**

The deficiency of Ojas quantitatively and/or qualitatively or functionally is called Ojaksaya.

**Nidana pancaka** (etiological factors):

Etiology- For the proper understanding, the Nidanas are broadly classified under the following headings.

i. **Aharaja Hetu** (Dietetic factors):  
*Virudhasana* (Incompatible diet), *Anassana* (To not taking food or doing excessive fast), *Ruksasana* (intake of inunctions food), *Pramitasana* (habitual intake of food having one test only), *Alpasana* (taking food in small quantity), *Ruksapana* (intake of unctuous drinks) and *Ksuda* (*Ksuda Nigrahamata*) are the Aharaja hetu described by Acaryas in different texts\textsuperscript{32}.

ii. **Viharaja:**  
All the Acaryas i.e. Caraka, Susruta and Vagbhata mentioned *Sramah* (Excessive physical work) in the list of etiological factor. According *Carakacarya Vayama* (excessive exercise), *Prajagrana*\textsuperscript{33} are the two other hetus for Ojaksaya.

iii. **Manasika:**  
*Kopa* (annoyance), *Soka* (grief), *Bhaya* (fear), *Cinta* (anxiety) are the some manasika hetus mentioned by the Acaryas\textsuperscript{34}.

iv. **Environmental:**  
The environmental causes which are described by Acaryas are *Vata*, *Atapa* and *Bhutopaghata* etc.

v. **Vyadhijanya:**  
*Ksaya*, *Abhigatha*, *Kapha*, “Sonita-Sukra-malam ativartanam” are the causes which ultimately give result to Ojaksaya.

vi. **Due to Vaidya pramad:**  
- Improper knowledge of sodhana process,
- After excessive sodhana and
due to the Vyapadas of Sodhana

**LAKSANA (CLINICAL FEATURES OF OJAKSAYA)**

The dosadusya sammurchana results in manifestation of characteristic signs and symptoms.

_Caraka Carya_ has explained the symptoms of _Ojaksaya_ which can be classified under two headings

1. Psychic (Manasika).
2. Somatic (Saririka).

_Ojaksaya_ is the resultant of derangement in the metabolism of number of _Dhatus_. The clinical manifestation of _Ojaksaya_ becomes obvious when the derangement at the level _dhatwagnivyapara_ is severe enough to affect the pool of _Ojas-sartabhava_ of all the conversions. The psychic symptoms seen in _Ojaksaya_ are Bibheti, Abhiksanam dhyayati, Durmanah etc.

1. **Bibheti** - which is fearful attitude or phobia, manifested as presence of illogical fear, afraid of particular situation or persons.
2. **Dhyayati** - continuous illogical worry which one seen as being unnecessarily worried about things which are otherwise trivial in nature.
3. **Durmanah** - which is bad mantation i.e. being occupied with abnormal thoughts.
4. **Vyathitendriya** – is rather a psycho-somatic presentation wherein pain or discomfort is present in the region of heart or in the sense organs for e.g. many a time patients of _Ojaksaya_ complained about _ksveda_ or tinnitus.
5. **Daurbalya** - it means being feeble, week or of little strength. It is one of the commonest Laksana of _Ojaksaya_. The pathogenesis of daurbalya is started with the derangement in the _dhatwagnivyapara_ which leads to deficient _posana_ of the _Dhatu_ at the somatic level of _Indriyas_ and _manas_ at psychic level.
6. **Duschaya-malinkanti** i.e. abnormal complexion or bad complexion this manifestation becomes obvious when _rasadhatwagni dusti_ is predominantly involved in the pathogenesis of _Ojaksaya_ as it is rasa Dhatu which is responsible for maintaining normalcy of the skin.
7. **Ksama**-emaciation is seen as leanness of the body. The impaired nutrition of all the _Dhatus_ which ultimately leads to _Ojaksaya_ is responsible for reduction in the mass of the body manifested as emaciation.

_Bala_ or _Oja_ abnormalities are of 3 kinds namely: 1. _Bala Visransa_, 2. _Bala Vyapat_ and 3. _Bala Ksaya_.

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- Symptoms observed due to *visransa* (*visransa* means displacement from its normal place): Looseness of joints, debility, displacement of three dosas, fatigue, impaired body functions.

- Symptoms due to *vyapat* are as (*vyapat* means vitiation by *dusta dosa* and *dushya*): heaviness and stiffness in body, exhaustion, discoloration, stupor, excessive sleep; swelling due to *vata* (*vata* is one of three *doshas*).

- Symptoms due to *kshaya* (loss) are as: fainting, depletion of muscle, unconsciousness, delirium, improper sensory perception, death.

AID/HIV in Ayurveda may be considered as Ojakshaya/ Kshaya, meaning the loss of Vital Energy.

**Factors responsible for enhancement of strength** (**Bala Vriiddhikar Bhava**)

According to Carakacharya there are 12 factors responsible for increasing Bala(strength) of the body:\(^3\)

1. Birth in a country where people are naturally strong like *sindh pranta*.
2. Birth at a time when people naturally gain strength i.e. *hemant* and *sisira ritu* (winter)
3. Favourable deposition of time( pleasant and moderate climate)
4. Excellence in the qualities of seed i.e. sperm and ovum, and *asaya* i.e. uterus of the parents.
5. Excellence of the ingested food.
6. Excellence of the physique.
7. Excellence of the satmya(wholesomeness of various factors responsible for maintenance of the body).
8. Excellence of the mind.
9. Favourable deposition of the nature.
10. Young age of both the parents i.e. they should not be over aged.
12. Cheerful disposition and immense love for each other.

The individuals possessing most of these factors are naturally immune i.e. Vyadhikshama for diseases.
Role of diet in maintaining immunity

Susrut says that food determines the origin of human beings and forms a chief source of their bodily strength, complexion as well as ojas ref. The persons who observe these practices are free from diseases; who consumption of wholesome diet; observation of wholesome behavior; unattached to sensual pleasures; One who donates regularly; impartial in judgement; who is always says truth; endowed with forbearing (forgiveness) nature and one who devoted to learned people. Wholesome food is the only sole cause for the growth of living being. Having proper food at time is said to be best among maintain haalalth. The food and drinks should have colour, smell, tast and touches pleasing to senses and conducive to the agni and constitution of the individual. It should be taken in accordance to the principles of Matravat ahara and Astviddi vihesh ayatan. Acharya Yogaratnakara says that the Bala of man depends upon the Agni of an individual proper maintenance of jatharagni (enzymes located in the gastro intestinal tract)helps a person to live a long life and its impairment gives rise to diseases. Hence Dipan, pachan dravyas like Pippali, Shunthi etc. Shodhan therapy like vaman, virechana, basti according to the condition Laghu, Ruksha, Anulomaka ahara for treatment of Ama should be used for proper maintenance of jatharagni

FOOD ARTICLES WHICH INCREASE OJAS AND BALA

1. The food which is light (laghu) cold in potency unctuous and beneficial to body
2. Jivniya drugs and milk and its product
3. Food aricles having madhur rasa and amla promotes ojus and strength.
4. Katu and tikta take away the strength.
5. Milk the cow milk has got the ten properties like that of ojus thus it is best among vitalizers. Takra and navnita are said to increase the strength.
6. Ghrita is mentioned as strength and ojas promoter.
7. Mamsarasa is meat soup it is nourishing and cordial it is as nectar for those suffering from phthisis, emaciation during convalescence. Eggs of swans, chakora, hens, peacocks and sparrows if consumed immediately promote strength.
8. Among cereals barley yava is balya, wheat is vitalizer, bulk-promoting, stabilizer and heavy.
9. All pulses in general are strength promoter especially masa and tila
10. Fruits that are sweet in taste are balya nad nourishing especially Grapes dates coconut ripened mango, vataram, abhisuka and aksota.
Role of rasayan therapy to improve immunity

Role of satva (psyche) in immunity

_Manasik Vyadhikkshamatva_ or _bala_ can be understood in the sense of making an individual strong mentally to cope up with mental stress variably and can tolerate the disease and treatment. _Ojas_ maintains the smooth functioning of cognitive or sensory organs thus making to perceive vision, audition, etc at their optimum level. As far as mind or psyche is concerned it endows an individual with the feeling of strength and delightness.

**DISCUSSION**

Ayurveda illustrates various measures necessary for maintaining good health. The unique concept of _Vyadhikkshamatva_ is of utmost importance. The equilibrium of somatic dohas i.e _Vata, Pitta, Kapha_ and psychological entities _Sattva, Rajas, Tamas_ maintains homeostasis and brings harmony in the functioning of body and mind. The factors held responsible for maintenance of such homeostasis in the body and hence vigour, vitality and good health are described here in brief. The _Vyadhikkshamatva, Bala_ and _Ojas_ are not entirely different from each other. All of these directly or indirectly indicate towards body resistance. In view of prevention and recovery from disease, body resistance plays a significant role. Though many pathogens are consistently present in surroundings, they require some essential favourable conditions and susceptibility of the individual. We can have the greater safety from the disease if we possess greater body resistance against the disease. The concept of _Vyadhikkshamatva_ given by _Acharya Cakrapani_ is of high meaning, when fully explored. It confines the idea of all the natural acquired, non specific types of immunity against all sorts of diseases. In his definition two significant terms _Vyadhibalavirodhitvam_ and _Vyadyutpadaprabandhakatvam_. The first term denotes the resisting power of the body (natural immunity) generally non specific type which attempts to defend the body in the first occurrence of any disease. The second term indicates that when the body is encountered by some disease if it happens to meet the same factors in future it will not allow the disease to be manifested because of possessing a specific resistant power.

_Ojas_ is the vital essence of all the _dhatus_ from _rasa_ to _sukra_ and it is responsible for the maintainence of tissue elements. These expressions indicate about two aspects of _ojas-rasatmaka ojas_ and _dhatusara ojas_. _Acharya Bhavamishra_ says _Rasa_ is the main _Ojas_, when it reaches in various _dhatus_ of the body through usual process; it becomes their integral part and may be considered under the name of those _dhatus_. All _Acharya_ have proclaimed the qualities of _Ojas_ to be similar to that of _kapha_. Abnormalities of _Ojas_ mean alteration of _Apara Ojas_. The
various factors responsible for vitiation of dosas and dhatuksaya are enlisted for abnormality in Ojus. Hence these factors may be prevented for better Bala. These factors result in decrease in Ojas causing immune deficiency syndrome and pscyho-immunological disorders.

Acharya Cakrapani mentions Ojas being a factor for resistance, is also the source of energy to all body elements including mind. Vyadhikkshamatva is only one of the numerous functions of Ojas. As the function of apara ojus and Vyadhikkshamatva in turn depends upon sahaja, kalaja and yuktikrta bala. innate strength is present since conception. Healthy lifestyle and balanced mental constitution of parents during pre conception and antenatal period is useful for good Sahaja Bala(innate strength). Kalaja Bala depends on seasonal variation and different stages of age of individual. Suitable diet and appropriate regimen according to the season is the way to achieve strength, vitality, energy and longevity. The acquired strength can be gained by appropriate diet and behavioural regimen. The diet includes the ghee, meat, milk etc along with normal balanced diet in accordance with dietary rules is important. Likewise use of Rasayana and Yoga is appreciated for attaining the bodily and mental strength. Ojas is responsible for apt systemic functioning of the body and healthy psyche. It helps to attain the heights of cognitive functions.

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