

Immunity-An integral tool of healthy life

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Abstract-

A strong Immune system plays a key role in health maintenance as well as well being of each individual. Importance of immunity is immensely realized during the pandemic of COVID 19 . A strong immunity is a integral part of Healthy life. Indian traditional medicinal science-Ayurveda has vividly described the term Immunity and has a deep deliberation about the factors affecting immunity. A homeostatic condition and equilibrium among the functional regulatory factors, structural component and byproducts of various metabolisms is a prime important thing for intact immunity .This is achieved by adapting good dietary and behavioral habits. This research article throws light on many such principles of immunity from ancient Indian medicinal science.

Key words-Immunity, strength, functional regulatory factors, oja, diet and food.,Taste.

Introduction

Health and wellness is a key factor for happy life. As we get exposed to many harmful microbes on daily basis , maintaining health is a task in the present era .Immune system protect us from invading infections and many diseases..A strong immunity is a integral part of Healthy life.

Resistance to diseases or immunity against diseases is of two kinds i.e. the one which attenuate the manifested disease and other variety prevents the manifestation of diseases.

Ayurveda as a traditional Indian medicine, have vividly described the factor of immunity in terms of 'vyadhikshamatva,' which is considered as the natural or acquired biological power of an individual, which protects him /her from disease¹ 'or it can be considered as the 'power of the body to arrest the occurrence and progress of diseases²

Factors which contribute for vyadhikshamatva are normal dosha,(three regulatory functional factors) equilibrium state of dhatu(Seven fundamental structural component), normal agni,(digestive and metabolic factors), potency of srotas(Pathway or channels for transportation of substances) etc. or factors which supports the equilibrium state of all physiological parameters³Also Ahara (food), Nidra (sleep), Vyayama (physical activity/exercise), Satva (mental stability), and Rasayana (rejuvenators) plays important role in maintaenence of Vyadhikshamatva. Immunity can also refer to Bala (strength) and Ojas (essence of all seven Dhātu)²

Review and Discussion

Agni(Digestive and metabolic factors) and immunity-

Agni is the entity in the body that is responsible for digestion, metabolism, and the assimilation of nutrients. As per Acharya Charaka, Agni is the fundamental causative agent for longevity, health, good strength, normal Ojas, resistance against infection, motivation, and skin lusture²(Thakur Rinky, NaikRaghavendra, Mythrey R C, BhatSulochana)

Aam(unripe by products)

When the digestive capacity becomes weak ,a number of unwanted unripe by products of digestion and metabolism start forming and accumulating in the body at different levels from the gross to the molecular

level, from a local gastrointestinal tract (GIT) level to the systemic level in tissues and cells. Such products are collectively called Ama and act as toxic and antigenic materials, giving rise to many antibodies. The presence of ama (including the production of antibodies) is characterized by increasing impermeability and sluggishness of the body channels or srotas resulting in functional deformity in the channels.. This allows accumulation of functional regulatory factors in their respective sites. This is first stage of pathogenesis of many diseases. Hence, , the main principle of treatment of all diseases in Ayurveda is to restore and to strengthen the Agni along with the digestion and metabolism¹.

There are certain systemic signs and symptoms of the ama state, viz. slow digestion, heaviness in the body, loss of appetite, nausea, excess salivation, distaste, constipation, heaviness in the belly, lethargy etc.. Ama is a kind of autotoxin and acts like a foreign body or antigen in the body to which the body reacts immunologically, releasing nonspecific antibodies in the system. The titer of these antibodies may indirectly indicate the presence and severity of the antigenic state of ama. Ama is the collective unwanted byproduct of digestion and metabolism, which is retained in the body and acts as an endogenous antigen¹

Gut Microbes

The digestive system of human has a lot to do with our immune system; it reflects our immunity and overall health. The human gut encounters many viruses, germs, and bacteria present in food items on a daily basis which is observed by the immune system in the gut. Our gut microbiome shapes our immune system⁴(Rajput, D. S.)

Research emphasis on the role of intestinal health to prevent the infection and inflammation.

IAP is an important apical brush border enzyme expressed throughout the gastrointestinal tract and secreted both into the intestinal lumen and into the bloodstream. IAP exerts its effects through dephosphorylation of proinflammatory molecules including lipopolysaccharide (LPS), flagellin, and adenosine triphosphate (ATP) released from cells during stressful events. Diminished activity of IAP could increase the risk of disease through changes in the microbiome, intestinal inflammation, and intestinal permeability. Exogenous IAP exerts a protective effect against intestinal and systemic inflammation in a variety of diseases and represents a potential therapeutic agent in diseases driven by gut barrier dysfunction such as IBD. The intestinal protective mechanisms are impaired in IBD patients due to lower synthesis and activity of endogenous IAP. IAP has been safely administered to humans and the human recombinant form of IAP has been developed⁵

Loss of IAP expression or function is associated with increased intestinal inflammation, dysbiosis, bacterial translocation and subsequently systemic inflammation. As these events are a cornerstone of the pathophysiology of many diseases⁶

Also the research shows that the inter-individual variation in cancer risk is associated with microbial biomass, composition and function and the interaction with host factor such as diet⁷

This is in tune with the concept that there is strong co relation of vyadhikshamatva(immunity)with Agni.(Digestive and metabolic factors)

Evolution is a continuous process of changes in structural and physiological mechanism in the living being. Many microbes and pathogens evolve naturally and proves harmful to community and can cause epidemics. Strong immunity is a key factor in preventing those invading infections.. Enough strong immunity is needed to prevent or survive in such conditions. like COVID-19 pandemic .. Ayurveda provides ways for evolving physiological responses to built immunity.

-Role of three functional regulatory factors(dosha),seven fundamental structural component(Dhatu) and Pathway or channels for transportation of substances(Srotas).

Kapha/shleshma is one of the three functional regulatory factors is said to be the important for maintaining immunity. Shleshma in normal state is bala or strength and oja, shleshma in abnormal state is mala/waste byproduct. Normal shleshma performs the functions like strength, protection, growth, resistance like that of oja. Shleshma as a one of three regulatory factors, is said to be responsible for maintenance of homeostasis or equilibrium in the body. Much more than just immunity it includes even physical and mental strength⁸

.. Dosh/functional regulatory factors manifests different diseases depending upon their vitiation and their co relation with fundamental structural component. Health is a state of body which is maintained by equilibrium of fundamental structural component. Wholesome dietary and behavioral regimen minimizes the vitiation of functional regulatory factors and maintains equilibrium in fundamental structural component.

Regular oil massage leads to strong body physique. Consumption of proper amount of food certainly helps the individual in bringing strength, complexion, happiness and longevity.

Person should adopt the healthy practices related to diet, conduct and activities to maintain health. Equilibrium state of fundamental structural component is health and gives rise to pleasure.³(Byadgi P.S)

Prakruti (Body constitution/Phenotype and personality type) and Immunity-

Prakruti is An individual's inherent nature is the discrete phenotype of an individual based on physical, psychological, physiological and behavioural traits, independently of social, ethnic and geographical variables. It represents a person's baseline state of optimal functioning of both body and mind. The predominant expression of an individual's inherent nature in bodily functions is known as body constitution with a predominance of dosha (doshaprakruti) and its expression in the domains of mental and physical personality is called kaya/manasaprakruti. However, for all practical purposes the doshaprakruti and kaya of an individual need to be interpreted in consideration with the following entities: ethnicity (jaati), familial inheritance, genetics (kula), the influence of a specific geographical region and climate (desha), as well as the ageing process (kala).⁹

Ayurvedic as a traditional Indian medicine has laid importance on the body constitution and personality types. The science has very individualized approach in applying treatment modalities and also in health maintaining daily and seasonal regimen. Hence every individual is examined for physical, physiological and psychological aspect and body constitution is determined on a basis of questionnaire.

Ayurveda also suggests differences immune response in individuals which is based on their *prakruti*. Immunophenotyping shows Significant difference in the expression of CD14, CD25 and CD56 markers between three different *prakruti* .. The increased level of CD25 and CD56 in *kaphaprakruti* may indicate ability to elicit better immune response, which is in conformity with textual references in Ayurveda¹⁰.

Bala/strength and immunity

Bala/strength is a multidimensional functional identity of the body, which is the output of proper equilibrium state of functional regulatory factors, fundamental structural component & mala in the body¹¹ (Dr. Vishal Sharma) .

It is of three types¹²

Sahaja (constitutional/innate), Kalaja (temporal/seasonal) and Yuktikrutajabala (acquired).

Sahaja Bala/Constitutional or innate strength is the one which is present since birth. Kalaja Bala/Temporal or seasonal strength is the one which is attained by virtue of favourable season or age.. In hot climatic conditions (late winter, spring and summers) strength of individual will be less and in cool climatic conditions (rainy seasons, autumn and winter) it will be more. Strength will be minimum in child and old age, maximum in young age. Yuktikrutaja Bala/ Acquired strength or immunity is attained by application of rational means like rejuvenation therapy or appropriate combination of diet and physical activities.

Factors responsible for promotion of strengthor Immunity-There are 12 factors responsible for increasing strength of the body.Immunity or strength is excellent in those people who

1. born in a country where people are naturally strong.
2. Born at a time when people naturally gain strength i.e. Hemanta (cold season) and Shisira (extreme cold season)
3. Favorable deposition of time (staying in pleasant and moderate climate where there are no extreme climatic conditions)
4. Progeny of the parents having excellent and healthy of sperm, ovum and uterus gain good immunity.
5. One who eats Excellent nutrition rich 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. Favorable deposition of the nature
10. In young age ,immunity naturally get increased.
11. Habitual performance of exercise
12. Cheerful disposition and immense love for spouse

¹¹Bala/strength is the cause for the good defense mechanism and to carry out all the physical and psychological actions. The depreciation of strength is a constant sign observed in various degenerative diseases and recurrent infections.

Excessively obese or emaciated persons are very weak. Similarly, the strength of the body depends largely upon the status of fundamental structural components i.e. mamsa (muscle tissue) fundamental structural component, asthidhatu (bone) and sonita (blood). These components have direct effect on healthy immune response. Hence persons in whom these three dhatu have improper physiological functions are naturally very weak.

A. The healthy condition of these three dhatu depends upon equilibrium of three functional regulatory factors, which is also required for resisting disease. This is because there is relation of interdependence (ashraya-ashrayee-bhava) .

B. The cells; WBC of blood (rakta) fight against infections and prevent the body from foreign pathogenic substance.

C. The red bone marrow in the (asthi) is responsible for manufacture of the red and white cells of the blood

Ojas and Immunity

According to Ayurveda, *Ojas* is the final essence of all the *Dhatus* (structural components of the body) and seat for the *Bala* (strength). If *Ojas* get vitiated or decreased, there manifests three kinds of immunity-compromised patterns, i.e., if failure of host defense occurs, then the immune status fall into three divisions i.e., *Ojavisramsa* (dislodged immune strength) such as autoimmunity, *Ojavyapat* (aberrant immune function brought about by morbid *Functional regulatory factors* and *Dushya* interaction) such as hypersensitivities and *Ojakshaya* (decrease in its normal quantity)—immune deficiencies and causes many disease manifestation and over a period of time leads to death of a person as well. Although these three states of *Oja* are different, all of them indicate an immune deficiency. In all these cases, the aim is to enhance *Bala*. *Oja* is vital energy that infiltrates into all tissues and cells and is also an element of our immune health and resistance to disease². (Thakur Rinky, Naik Raghavendra, Mythrey R C, Bhat Sulochana)

¹³Factors that reduces Ojasare,

1. excessive physical exercise,
2. fasting for long period,

- 3 constant worry
 - 4 Consumption of foods which are dry in nature,
 - 5 consuming very less quantity of food,
 - 6 excessive exposure to heavy blows of wind and sun heat,
 - 7. fear
 - 8. sorrow,
 - 9. keeping awake at nights,
 - 10. excessive elimination of Kapha, Shonita (blood), Shukra (semen) and Mala (urine and faeces),
 - 11 Kala (due to old age),
 - 12 Abhighata (mental and physical trauma) or injury to Marma (vital parts)
 - 13 Kopa (anger) and
 - 14 Ativyavaya (excessive sex)
- These factors reduce *soja* and ultimately hampers the immune system.

Ahara (food) and immunity

Food is a very basic requirement of every cell. Each living cell needs food or energy for day to day activities and for survival. Indian Traditional medicinal system- Ayurveda, have a definite focused approach on food for healthy life.

A complete balanced food can make life healthier and can increase longevity. Food can act as medicine. As per Taittiriya Upanishad, man or life is originated from food¹⁴.

Most health problems develop due to the incorrect eating practices and cookery procedures.

It is observed that good immunity in an individual will be due to active and healthy functioning of the digestive system. It depends mainly on the type of food consumed. Higher diet quality is associated with the positive health of the body. Quality diet, required quantity and balanced food, is the base for the proper digestion and in turn for the development of a strong immune system² (Thakur Rinky, Naik Raghavendra, Mythrey R C, Bhat Sulochana)

Traditional Indian medicine lays stress on positive health, a blend of physical, mental, social, moral and spiritual welfare and this holistic medical science considers three important factors while dealing with the health and disease i.e. *aoushadha* (drug & therapies), *ahara* (diet) and *vihara* (practices). Among these, diet (*ahara*)¹⁵ plays key position as recounted by major Ayurvedic literatures

Ayurveda, as a traditional Medical science, has laid emphasis on the dietetics to remain fit and healthy.

Principles of dietetic and their importance to increase immunity.

1. Taste (Rasa) as an Indicator of Health Effects¹⁵

One of the ways of food classification in Ayurveda is based on *rasa*. or taste of a particular food item. There are six major tastes according to Ayurveda, viz., sweet, sour, salty, pungent, bitter, and astringent. There are primary and secondary qualities (*guna*) that increase the properties of a material. This is further augmented by potency (*virya*), post digestive effect (*vipaka*), and therapeutic action (*karma*).

¹⁶Biological activity and Nutritional impact of different tastes of food

Taste	Metabolic Impacts
Sweet (Madhura)	Tissue nourishing/ bulk promoting Hair tonic Nourishing Wound healing Galactogogue
Sour (Amla)	Nourishing/ bulk promoting Cardio-protective

Astringent (Kashaya)	Wound healing
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Effect of taste on biological factor

SNo.	SNo. Biological factors (functional regulatory factorss)	Controlling / balancing tastes	Aggravating/ deranging tastes
1	Vata (Neurological phenomenon)	Madhura (Sweet) Amla(Sour), Lavana (Salt)	Katu(Pungent), Tikta(Bitter), Kashaya (Astringent)
2	Pitta (bio-chemical phenomenon and metabolism)	Kashaya (Astringent), Tikta (Bitter), Madhura (Sweet)	Amla (Sour),Lavana (Salt), Katu(Pungent)
3	Kapha (Immunity, qualitative and quantitative perfection and integration of tissues /organs and systems	Katu (Pungent), Tikta(Bitter), Kashaya (Astringent)	Madhura (Sweet), Amla(Sour), Lavana (Salt)

Each taste imparts a positive effect on a particular body elements and at same time ,it acts negatively on other element.According to ayurveda,a balanced food plate ,which contains all six rasa,is important to maintain equilibrium in functional regulatory factors and ultimately to maintain stronger immunity .

2.Wholesome food for enhancing immunity¹¹

Wholesome and unwholesome food is main factors that can alter immune power. The wholesome and suitable foods are beneficial for health i.e.; water, Ghee, milk, wheat and rice, etc. The Ahita or unwholesome or not suitable food substances like excessively sour, hot, spicy and oily foods with lack of nutritional value causes ill effects and decreases immunity. Consumption of wholesome food is responsible for healthy fundamental structural component which further forms Oja (essence of seven structural component)and increases immunity. .

On the contrary,unwholesome food is responsible for improper nourishment of Fundamental structural components due to which Ojus get decreases and immunity also diminishes..(Dr. Vishal Sharma

¹⁶The immuno-allergic, hypersensitive reactions can be explained by the following Ayurvedic theory. In compatible food substances acts as antigen and contain the following qualities by which they cause vitiation of doshas resulting in different allergic and hypersensitive reactions.

- 1.inherent feature of particular food.,
2. *Its* physical and chemical combination,
3. *Processing or* Refinement

According to Kashyapa(A Ayurveda scholar) the following factors are attributed to hypersensitivity, immuno-allergic reactions.

1. incompatible exposures
2. incongenent substances to produce antigens
3. Drug interactions
4. Micro organisms
5. Psychic Eversion.

This leads to different clinical condition viz. 1. itching 2. skin disorders; 3.Allergic skin lesions 4. boils; 5. callosity; this can be comparable to photoallergic and phototoxic reactions caused by industrial hydrocarbons, tars etc., which emits considerable UV radiation of different wave lengths

Immunity boosting food¹⁷

Vegetables and fruits rich in beta carotene, vitamins and ascorbic acid improves immunity, certain foods like tomato, bell pepper, mushroom ms, broccoli, spinach and other green vegetables also build resistance against infection.

Ayurveda deals with the pathyavyavastha (planning of diet- dietetics) in a very scientific and holistic way Pathya (or a proper diet advocacy) is defined as the „diet plan“ which is congenial to the channels of the body & relished by the person, that keeps the individual healthy, maintains normal body functions leads to proper functioning of the organs, nourishes the mind and intellect, prevents diseases and at the same time corrects the irregularities that may occur in the body¹⁶

Diet provides macronutrients (carbohydrates, proteins, and fats), micronutrients (vitamins and minerals), and phytochemicals (non-nutrient bioactive compounds). Emerging evidence suggests that dietary components can directly impact the composition and metabolic activity of the mammalian gut microbiota and in turn, affect both physical and mental health¹⁸.

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