



Review Article

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A REVIEW ON IMMUNOMODULATION AND IMMUNOPROTECTION IN ALLERGIC ASTHMA: AN AYURVEDIC APPROACH

Jyotish.S. Jayandan ^{1*}, Ratnaprava Misra ², Mahesh. C. Kundagol ³

¹PG Scholar, Department of Kayachikitsa, Amrita School of Ayurveda, Vallikavu, Clappana p.o, Kollam, Kerala, India

²Professor, Department of Kayachikitsa, Amrita School of Ayurveda, Vallikavu, Clappana p.o, Kollam, Kerala, India

³Associate Professor, Department of Kayachikitsa, Amrita School of Ayurveda, Vallikavu, Clappana p.o, Kollam, Kerala, India

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*Corresponding author

E-mail: jyotishjayandan@gmail.com

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ABSTRACT

In this modern era of increasing pollution rates and toxicity in everything that is used by the mankind there is an increasing rise of Allergic Disorders all over the world especially Allergic Asthma. Even though there are other medical managements available there are much side effects and shortcomings produced from their long-term use. So, this is a very humble effort to provide a way of Immunomodulation and Immunoprotection through Ayurveda using the classical methods quoted by our Acharyas (teachers). For applying our treatment aspects so as to bring about Immunomodulation and Immunoprotection, we have to define and understand what exactly is the concept of Immunity, Allergy, Allergic Asthma on the basis of our classics. On analysing we could find that our concepts of Bala (strength), Ojas (vital essence), Vyadhikshamatva (resistance against diseases), Ojo Dosha (alteration in vital essence), etc are at par with modern concept. So, in order to bring about Immunomodulation and Immunoprotection we can use the therapeutic measures and other Lifestyle modification told by our classics like Shodhana chikitsa (purificatory therapy), Shamana Chikitsa (pacificatory therapy, Rasayana Chikitsa (rejuvenatory Therapy) and Nidana Parivarjana (avoiding causative factors). By adopting these measures, the basic Samprapthi, (pathogenesis) underlying the disease is arrested and modulated and further relapses are avoided. We have also tried to analyse the properties and mode of action of an Ayurvedic drug Chitrahareetaki Lehya which is well used in clinical practice to tackle Allergic conditions so as to understand how our medicines help in bringing about Immunomodulation and Immunoprotection in Allergic Asthma.

Keywords: Immunomodulation, Immunoprotection, Allergic Asthma, Immunity, Allergy, Ojas, Bala.

INTRODUCTION

The burden of Allergic diseases in India has been on an uprising trend in terms of prevalence as well as severity. Allergic diseases comprise of Asthma, Rhinitis, Anaphylaxis, Drug, Food and Insect allergy, Eczema, Urticaria and Angioedema. Increased urbanization is associated with the hike in incidence of Allergic Diseases. Approximately 20% to 30 % of total population suffers from at least one of these Allergic diseases in India¹. Allergic Asthma is the most easily recognized Asthma phenotype, which often commences in childhood and is associated with a past and/or family history of Allergic disease such as Eczema, Allergic rhinitis, or food or drug Allergy. Examination of the induced sputum of these patients before treatment often reveals Eosinophilic airway inflammation². Prevalence of Asthma varies considerably within countries and between countries. It is more prevalent in developed countries than developing ones, more in children (15%) than adults (10% to 12%), more in urban than rural areas, reasons of which are not fully understood. Nearly 8% to 10% of the total population suffers from it. In India, the prevalence of Asthma has been found to be around 7% in the majority of surveys done. However, it has been reported to vary from 2% to 17% in different study populations, the disease can start at any age, but in a majority, it starts before 10 years of age. It is twice more common among boys than girls, whereas in adults the male to female ratio is usually equal³.

Immunomodulation and Immunoprotection in allergic asthma

From a therapeutic point of view, Immunomodulation refers to: "any process in which an Immune response is altered to a desired level"⁴ (curative aspect).

Immunoprotection refers to: "protection against the affects of an antigen"⁵(preventive aspect).

Modulation of the Immune system denotes to any change in the Immune response that can involve induction, expression, amplification or inhibition of any part or phase of the Immune response⁶.

Based on their effects divided into

Immunostimulators - These agents are characteristically non-specific in nature as they are envisaged to enhance body's resistance against infection.

They can act through both innate Immune response and adaptive Immune response.

Immunosuppressants: - These are a structurally and functionally heterogeneous group of drugs, which are often concomitantly administered in combination regimens to treat various types of Organ transplant rejection and Auto Immune diseases⁷.

Immunity

Resistance of the body against the pathogenic agents is known as Immunity or it is the ability of the body to resist the entry of different types of foreign bodies⁸.

There are two types of Immunity- Innate Immunity or Natural Immunity- the Immunity that we receive from the mother following birth.

Acquired Immunity or Specific Immunity- is that which we acquire by means of active infection or various vaccinations.

On the basis of pathophysiology Immunity is divided into two- Cellular Immunity which is mediated by T-Lymphocytes and Humoral Immunity which is mediated by B Lymphocytes⁹.

When the Immune system is deranged Allergy comes into the scenario. Allergy as an acquired abnormal hyper Immune reaction to an agent during a second or subsequent occasion or a state of exaggerated or altered Immune response to a given agent¹⁰. The word Immunity is synonymous with resistance meaning protection from particular diseases or injuries, whereas the term Allergy is interchangeable with Hypersensitivity meaning a state of exaggerated or altered Immune response to a given agent¹¹.

There are four types of Immunological disorders and Allergic Asthma comes under Hypersensitivity Type 1 or Anaphylactic Reaction. So in Allergic Asthma there is a rapidly developing Immune response in a previously sensitised person and within a peak action time of 15-30 minutes which is mediated by IgE Antibodies and is caused due to etiological factors like pollutants, genetic factors, and viral infections etc¹².

The need of Immunomodulation and Immunoprotection in Allergic Asthma is that in the pathogenic process there are increased levels of IgE Antibodies in the serum due to the inhaled antigen initiating an IgE-mediated type I Hypersensitivity reaction which includes both an 'Acute Immediate response' and a 'Late phase reaction'.

The acute immediate response is initiated by IgE-sensitised Mast cells which are tissue counterparts of circulating Basophils on the mucosal surface. These Mast cells when they degranulate release mediators like Histamine, Leukotrienes, Prostaglandins, Platelet Activating factor and Chemotactic factors for Eosinophils and Neutrophils. These released mediators cause bronchoconstriction, oedema, mucus hypersecretion and accumulation of Eosinophils and Neutrophils which cause the symptoms of Asthma.

The Late phase reaction follows the acute immediate response and is responsible for the prolonged manifestations of Asthma. It is caused by excessive mobilisation of blood Leucocytes that include Basophils besides Eosinophils and Neutrophils¹³.

Ayurvedic approach

Immunity in Ayurveda can be related to various aspects like Vyadhikshamatvam (resistance against diseases), Balam (strength) and Ojas (vital essence). Chakrapani in his commentary on Charaka samhita Sutrsthana 28th chapter 7th sloka has quoted that Vyadhikshamatvam or resistance to disease is of two kinds that is Vyadhi bala virodhitwa which attenuate the manifested disease and Vyadhi utpada pratibhandanatvam that which prevents the manifestation of

disease which may be correlated to Immunomodulation and Immunoprotection respectively.¹⁴

When we consider the concept of Ojas (vital essence), as it is the substantial essence of all the dhatus (body tissues) ending in Shukra (semen), it maintains the functioning of the body. The destruction of Ojas (vital essence) leads to the destruction of the individual and its presence maintains life¹⁵.

When we analyse the concept of Bala (strength) in Ayurveda Acharya Charaka in his Sutrasthana has quoted that there are three types of Bala (strength) that is Sahaja Bala which we inherently receive from birth, Kalaja Bala which is dependent on age and season and finally Yukthikrita bala which is the acquired strength that is dependent on healthy practices related to diet and activities¹⁶.

Immune Disorders, Allergy and Ayurveda

Immune Disorders and Allergy in Ayurveda can be brought under the context of Ojo Dosha (alteration in vital essence) which is

Ojo Visramsa	
Ojo Vyapat	Ojo Dosha
Ojo Kshaya	

Ojo Visramasa (displacement of vital essence) is characterised by Sandhi Vishlesha (looseness of joints), Dosha Chyavanam (displacement of biological humors), Gatra Sadanam (weakness of body) and Kriya Sannirodha (impaired activities).

Ojo Vyapath (vitiated vital essence) which is characterised by Sthabdha Guru Gatratha (stiffness and heaviness in body), Vata Shopha (swelling due to biological air humor), Varna Bheda (loss of complexion), Glani (exhaustion), Tandra (stupor) and Nidra (excessive sleep).

Ojo Kshaya is characterised by Moorcha (fainting), Mamsa Kshaya (muscle wasting), Moha (unconsciousness), Pralapa (delirium), and Marana (death).¹⁷

When we analyse the Samprapthi (pathogenesis) of Allergy we can infer that

The improper Ahara (diet) Vihara (regimens and activities) and Agantuja (other causes) factors like Rajo (dust), Dhooma (smoke) etc leads to Mandagni (faulty digestion) and Ama (metabolic toxins) formation and causes vitiation of Rasa (first formed body tissue) and Raktha (blood) and there is no proper Dhatu Parinama (subsequent formation of body tissues) which leads to impairment of Ojas (vital essence), Bala (strength) and ultimately it leads to the manifestation of symptoms of Allergy. There are four types in which Samprapthi (pathogenesis) can occur, they are

- Aharaja (dietary causes) - Intake of some kinds of food may trigger Asthmatic attack eg, shellfishes, nuts etc.
- Viharaja (cause relating to regimens)- (Exposure to smoke may be a triggering factor.
- Manasika (mental factors) - Stress may be a triggering factor for Asthma.
- Aganthuja (other factors) - Viral infections may also trigger Asthmatic attacks.

So, we can infer that Allergic Asthma is predominantly.

- Mostly Kapha Vataja (biological phlegm and air humor) in nature.

- Rasa (first formed body tissue) and Raktha (blood) are vitiated.
- Shareera Bala (body strength) or Ojas (vital essence) is impaired.
- Presence of Agni Mandhya (faulty digestion/metabolism) and Ama (metabolic toxins) at Sookshma level (minute).
- Agantuja factors (other factors) like Krimi (viral infections) and Manasika factors (mental factors) are also involved

Immunomodulation and Immunoprotection in allergic asthma through Ayurveda Allergic Asthma and Ayurveda

When considering Allergic Asthma, we find that it can be correlated to Tamaka Shwasa (Bronchial Asthma) explained in classics.

The etiological factors told for Tamaka Shwasa (Bronchial Asthma) like exposure to Rajo, (smoke), Dhooma (smoke), Vata (wind) , Sheeta (cold) etc are also told by modern science like exposure to allergens like smoke, dust, house mite, pollen etc. On analysing the symptoms, we find that the symptoms are also similar to each other like Shwasa Kashtatha (difficulty in breathing), Ghurghuraka (wheezing), Peenasa (rhinitis), and Kasa (cough)¹⁸.

So Immunoprotection and Immunomodulation can be brought about by following measures like

- By maintaining proper Ojas (vital essence) in the body.
- Increasing Vyadhikshamatva (resistance against diseases) by various activities.
- Increasing Bala (strength) especially Yukthikrita Bala (acquired strength that is dependent on healthy practices related to diet and activities).
- Following Pathya Ahara Viharas (wholesome diet and regimen) which are suitable to oneself.
- Nidana Parivarjana (avoiding causative factors).
- Undergoing Ritu Shodana (seasonal detoxification) judiciously.
- By following proper Dina Charya (daily regimen).

Immunoprotection- as Immunoprotection is a preventive aspect the following measures can be deployed like

- Following proper Dinacharya and Ritucharya (daily regimen and seasonal regimen).

- Maintaining a healthy life style.
- Following Pathya (wholesome factors).
- Following Rasayana (Rejuvenatory Therapy).
- Undergoing Ritu Shodhana (seasonal detoxification) timely and according to classics.
- Regimens that increase Yuktikrita Bala (acquired strength that is dependent on healthy practices related to diet and activities).
- Nidana Parivarjana (avoiding causative factors).

Immunomodulation –Immunomodulation can be brought about by Shodhana Chikitsa (purificatory therapy) in the form of Vamana (induced vomiting), Virechana (induced purgation) or Nasya (nasal errhines) if required to remove the Doshas (body humours) which are the base for the disease. Shamana Chikitsa (pacificatory therapy) with drugs that are having Kapha- Vata hara (pacify biological air and phlegm humor), Ushna Guna (hot in nature), Vatanulomaka (carminative) and Srothoshodhaka (purifies body channels) properties by nature.¹⁹

Rasayana Chikitsa (Rejuvenatory Therapy) with drugs which provide long term remission and resistance against relapse of symptoms.

Nidana Parivarjana (avoiding causative factors) - Avoiding the circumstances which may lead to the re occurrence of the symptoms.

By these measures starting from Shodhana (purificatory therapy) to Nidana Parivarjana (avoiding causative factors) the basic cause for the causation of the disease, the derangements of Doshas (body humors) are removed which restores proper Agni (digestion), Dhatu Parinama (subsequent formation of body tissues) and Ojas (vital essence) in the body. Rasayana (rejuvenatory therapy) helps in providing long term resistance against the disease and by Nidana Parivarjana (avoiding causative factors) the circumstances favourable for disease production is avoided.

Chitrakahareetaki lehya in allergic asthma

Chitrakahareetaki lehya which is told in Bhaishajya Ratnavaly Nasarogadhikara 31st chapter is a drug that is commonly given for allergic conditions. If we analyse the properties of the drugs we find that²⁰

S.N	Drug	Rasa	Guna	Virya	Vipaka	Karma
1	Chitraka	Katu	Laghu, Rooksha Teekshna	Ushna	Katu	Kaphavatahara
2	Amalaki	Lavanarahita Pancarasa	Guru, Rooksha Sheeta	Sheeta	Madhura	Tridosahara Krimigna
3	Hareetaki	Lavanarahita Pancarasa	Laghu Rooksha	Ushna	Madhura	Tridosahara
4	Gudoochi	Tikta Kashaya	Guru, Snidha	Ushna	Madhura	Tridosahara
5	Bilva	Kashaya Tikta	Laghu Rooksha	Ushna	Katu	Kaphavatahara
6	Agnimantha	Lavanarahita Pancarasa	Rooksha Laghu	Ushna	Katu	Kaphavatahara
7	Syonaka	Madhura Tikta Kashaya	Laghu Rooksha	Ushna	Katu	Kaphavatahara
8	Patala	Tiktha, Kashaya	Laghu Rooksha	Ushna	Katu	Tridosahara
9	Gambhari	Tiktha,	Guru	Ushna	Katu	Tridosahara

		Kashaya Madhura				
10	Gokshoora	Madhura	Guru, Snigdha	Sheeta	Katu	Vatapittahara
11	Bhrihati	Katu, Tiktha	Laghu, Rooksha Teekshna	Ushna	Katu	Kaphavatahara
12	Kantakari	Tiktha, Katu	Laghu, Rooksha Teekshna	Ushna	Katu	Kaphavatahara
13	Saliparni	Madhura, Tikta	Guru, Snigdha	Ushna	Madhura	Tridosahara
14	Prishniparni	Madhura, Tiktha	Laghu Snidha	Ushna	Madhura	Tridosahara
15	Pippali	Katu	Laghu, Snigdha Teekshna	Anushna sheeta	Madhuram	Kaphavatahara
16	Shunti	Katu	Laghu, Snigdha	Ushna	Madhura	Kaphavatahara
17	Maricha	Katu	Laghu, Teekshna	Ushna	Katu	Vatakaphahara
18	Tvak	Katu, Tiktha, Madhura	Laghu, Rooksha Teekshna	Ushna	Katu	Kaphavatahara
19	Patra	Tiktha, Madhura	Theekshna Ushna, Laghu	Ushna	Katu	Kaphavatahara
20	Ela	Katu, Madhura	Laghu, Rooksha	Sheeta	Madhura	Tridosahara
21	Yavakshara		Laghu, Snigdha, Sookshma			
22	Madhu	Kashaya Madhura				Chedana karma ²¹

So, we find that most of the drugs in this yoga are

- Ushna Veerya (hot in potency).
- Kapha –Vatahara in nature (pacify biological air and phlegm humors).
- Deepana (appetizing) - Pachana (digestive), Anulomana (carminative) in nature.
- Srotoshodhaka, (clears body channels), Raktaprasadhaka Gunayukta (contains blood purificatory property).
- Anti Histaminic, Anti Inflammatory in action.
- Anti-Oxidant by nature.
- Contains Immunostimulatory ingredients.

While analysing the pharmacological properties of these drugs we can find that drugs like Chitraka is having Anti-Allergic, Anti-Inflammatory property²². Gudoochi is having Immunomodulatory and Anti-Toxic properties²³. Hareetaki is having Anti-Bacterial, Anti-Oxidant and Immunomodulatory actions²⁴. Agnimantha is having Anti Inflammatory, Anti Asthmatic and Immunomodulatory actions²⁵. Amalaki is having Immune system enhancing actions²⁶. Gokshoora is having Immunomodulatory, Anti-Inflammatory and Anti-Bacterial property²⁷. Syonaka is having Immunomodulatory, Anti-Inflammatory, Anti –Oxidant and Anti- Bacterial activity²⁸.

CONCLUSION

So, we can understand that Ayurvedic line of management also basically aims at bringing about Immunomodulation and Immunoprotection in managing Allergic Asthma. The drugs used in treating such conditions are seen to have proven Immunomodulatory and Immunoprotective properties inherent within them. So by the judicious use of our classical lines of management we can effectively treat conditions occurring from derangements in the Immune system. In this ere where traditional medicine is gaining momentum we can bring about

our own unique way of treating Immune related disorders to provide maximum relief and prevent the chances for relapses and other side effects. More works has to be done to identify the Immunomodulatory effects of Ayurvedic single drugs and formulations.

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