ABSTRACT

Immunodeficiency diseases are one of the serious global health problems leading to increased mortality and morbidity. Immunodeficiency is the state in which the immune system’s ability to fight against infectious disease is compromised or entirely absent. Immunodeficiency disorders can be inherited, acquired or drug induced. Certain types of cancer, viral infections, AIDS, malnutrition, stress, can cause immune deficiency conditions. An immunocompromised person may be particularly vulnerable to opportunistic infections, in addition to normal infections that could affect everyone. Common symptoms of immunodeficiency include extreme susceptibility to contagious illness of allergy, fatigue, loss of energy, respiratory disorders, fever, loss of appetite, a general feeling of weakness and lethargy. Immunity in Ayurveda is not Immunity against a specific infectious agent or disease such as polio or rubella. In Ayurveda, certain conditions like rajayaksha, ojoksha, sannipatha jwara, cause immunodeficiency where loss of ojas is a cardinal feature. In Ayurveda, rasayana therapy is indicated for the prevention as well as for curing of immunodeficiency disorders. Rasayana improves the host resistance of an individual, helping to prevent ageing and diseases. It is used in chronic and severe debility of the body secondary to major illness including cachexia associated with rajayaksha, diabetes mellitus etc. Certain drugs are well known for their immunomodulator and antioxidant properties. Immunomodulation is an important attribute in the strengthening of immune competence in a controlled manner. Besides immuno modulatory action, rasayana drug act as antioxidant, antistress, anti inflammatory, antimicrobial, anti aging, anti arthritic and anti bacterial agent.

CONCEPT OF IMMUNITY

ACCORDING TO MODERN VIEW

Immune system is the body’s defence against infectious organisms and other invaders. Through a series of steps called immune system attacks organism and substances that invade body system.

IMMUNE SYSTEM:

It consist of network of cells, tissues, and organ that help in recognition and destruction of foreign bodies. Leukocytes, epithagocytes, lymphocytes, bonemarrow, lymph nodes, tonsils, thyroid, spleen are all the part of immune system.

1st line of defence: The body’s first line of defence is usually physical and chemical barriers which includes skin, sweat, tears, saliva, mucus etc.

2nd line of defence: If pathogen is able to get past through body’s first line of defence, the body rely on second line of response called the inflammatory response.

3rd line of defence: If second line of defence fails, the immune system recognises, attacks, destroys, and remembers each pathogen that enters the body. It does this by making specialised cells and antibodies.

TYPES OF IMMUNITY

1. INNATE/NATURAL/NON-SPECIFIC IMMUNITY

Present from birth and it is the inborn capacity of the body to resist the entry of foreign bodies through body’s first line of defence.

2. ACQUIRED/SPECIFIC IMMUNITY

Lymphocytes (T and B lymphocytes) are responsible for such type of immunity.

Based on the type of immune mediators involved, acquired immunity is of two types:

a. Humoral immunity: It is mediated by secreted antibodies. It is called active type when the organism generates its own anti bodies and it is called passive type when antibodies are transferred between individuals and species.

b. Cell mediated immunity: It involves T lymphocytes alone. It is active when the T cells are stimulated and passive when T cells come from another organism.

Based on whether the host built up immunity itself or through another source, immunity is of two types:

a. Active immunity: It occurs when one makes its own antibodies. It is a long term immunity. It is acquired through vaccination which helps the B lymphocytes to recognise the antigen and attack the antigen. Similarly, exposure to infections stimulates the production of memory cells which are then stored to prevent the infection in future.

b. Passive immunity: It occurs when the antibodies comes from another source and is short term immunity.

Eg: passive immunity through mother’s breast milk.

Gamma globulin injection provides temporary immunity.

ACCORDING TO AYURVEDIC VIEW

Ayurveda emphasises the promotion of health through the strengthening of host defenses, to act as resistive force against physiological extremes as well as opportunistic ailments. This force computed as regards everyday wellness termed as vyadhikshamatva. The resistance power of the body which prevents the development of disease is called immunity or vyadhikshamatva. Ayurveda conceives a unique concept of

KEY WORDS: Immune Deficiency, Immunomodulators, Ojas, Rasayana, Vyadhikshamatva
Immunomodulators are drugs that either suppress (immunosuppressants) or stimulate the immune system (immunostimulants). These are active agents of immunotherapy. The concept of immunomodulation emphasizes on enhancing the body's healthy organs and tissues as though they are not functioning properly. Immune deficiency disorders are either congenital (primary) or acquired (secondary).

**Examples for primary immunodeficiency disorders:**
- X-linked agammaglobulinemia
- Common variable immune deficiency
- SCID-Severe Combined ImmunoDeficiency

Secondary immunodeficiency disorder happens when infections attack the body. The main causes include severe burns, chemotherapy, radiation, diabetes, malnutrition etc. It includes:
- AIDS
- Cancers of immune system like leukemia
- Immune complex disorders like viral hepatitis
- Multiple myeloma

**RISK FACTORS:**
- People with family history of primary immunodeficiency disorders, age, spleen removal, exposure to infectious fluids etc.
- Signs and symptoms: cold, diarrhea, sinus infections, pneumonia, meningitis, bronchitis, blood disorders including anemia, inflammation and infection of internal organs.

**DISCUSSION**

The immunodeficiency disorders that are caused by a defect in the immune system include primary and secondary immunodeficiency disorders. Primary immunodeficiency disorders are congenital or hereditary and are present from birth. Secondary immunodeficiency disorders develop due to another disease or condition that affects the immune system.

**DISEASES OF IMMUNE SYSTEM**

**IMMUNODEFICIENCY DISORDERS**

An immunodeficiency disorder occurs when the immune system is not functioning properly. Immune deficiency disorders are either congenital (primary) or acquired (secondary).

Secondary immunodeficiency disorders may be caused by other diseases or conditions that affect the immune system. Some common examples include:
- HIV/AIDS:
  - Acquired Immunodeficiency Syndrome (AIDS)
  - AIDS-related Complex (ARC)
- Chemotherapy:
  - Chemotherapy-induced Myelosuppression

**RISK FACTORS:**

- People with family history of primary immunodeficiency disorders, age, spleen removal, exposure to infectious fluids etc.
- Signs and symptoms: cold, diarrhea, sinus infections, pneumonia, meningitis, bronchitis, blood disorders including anemia, inflammation and infection of internal organs.

**AUTOIMMUNE DISORDERS**

In autoimmune diseases, the immune system mistakenly attacks healthy body organs and tissues as though they are foreign invaders. It includes:
- Lupus:
  - Systemic Lupus Erythematosus (SLE)
  - Discoid Lupus Erythematosus
- Rheumatoid Arthritis
- Scleroderma
- Ankylosing Spondylitis
- Juvenile Dermatomyositis

**CONCEPT OF RASAYANA AND MODE OF ACTION OF RASAYANA DRUGS**

In Ayurveda, four approaches are used in the clinical practice for the treatment of immunodeficiency disorders—samsodhana, samsamana, rasayana and satwavachaya chikitsa.

**Rasayana**

Rasayana is a very useful method in Ayurveda and is termed as rasayana because they conduce to replenishment of rasa and other dhatus. Rasayana means an improved state of norishment, which inturn uplifts increased immunity and youthfulness. Rasayana drugs are supposed to strengthen ojas and Bala. It helps in promotion of memory, complexion, improves host resistance. Ayurveda addresses immunological up regulation primarily through the use of rasayana. For better rasayana effects, samsodhana therapy is always needed to achieve nutritional requirements of body cells.

**MODE OF ACTION OF RASAYANA DRUGS**

Rasayana drugs act by one of following 3 ways:
- Acting at the level of rasa thus directly Improving the quality of nutrition. Rasayana drugs having Madhuri, guru, snigdha and sheets property act at this level.
- Acting at the level of Agni: by improving digestion and metabolism. Rasayana drugs having ushna, rukshha, katu, thikta, kashaya, katu, kapha property act at this level.
- Acting at the level of srotas: By improving the micro circulation, it ensures proper perfusion, helpful in distribution of ojas to dhatu. Rasayana drugs which possess thikta, visada, ruksha, laghu, ushna act at this level.

Ayurveda make use of both single herbs and compound formulation to improve and maintain body immunity. Some of important rasayana drugs are as follows:

- Tinospora cordifolia (Guduchi):- used in management of jaundice, diabetes, skin diseases. It improves phagocytic action of macrophages.
- Emblica officinalis (amalaki):- rich source of vitamin C. It use as antioxidants, antibacterial, antiinflammatory agent.
- Terminalia chebula (Hareetaki):- It is an antibacterial, antioxidant, antiinflammatory, immunomodulatory agent used in prophylaxis of cytomegalovirus.
- Glycyrrhiza glabra (yashtimadhu):- it increases leucocyte count, anti allergic, antioxidant, immunostimulant.
- Commiphora mukul (guggulu): it is an immunostimulant, anti hyperlipidemic, and immunomodulatory agent.
- Allium sativum (lajun): It is an antimicrobial, antitumour, hypolipidemic drug. Diallyl sulphide in allium is known to have antitumorigenic agent.
- Shilajit (Ashvagosh): It activates macrophages and enhances cytokine release. It exhibit cytotoxic effect.
- Chyawanaprash (avaleha):- contains amalaki used in treatment of pulmonary tuberculosis, improves general immunity.

**RECOMMENDATIONS**

The immunodeficiency disorders are caused by a defect in the immune system, which can be congenital or acquired. Secondary immunodeficiency disorders develop due to another disease or condition that affects the immune system. Immunomodulators are drugs that either suppress (immunosuppressants) or stimulate the immune system (immunostimulants). These are active agents of immunotherapy. The mode of action of rasayana drugs is by one of following 3 ways:

1. Acting at the level of rasa thus directly improving the quality of nutrition.
2. Acting at the level of Agni: by improving digestion and metabolism.
3. Acting at the level of srotas: By improving the micro circulation, it ensures proper perfusion, helpful in distribution of ojas to dhatu.
holistic ways by strengthening host defence against diseases. The concept of immune stimulation has been used successfully in ayurveda in immuno competent conditions like AIDS, TB, cancer. Rasayana therapy make it possible to improve immunity, health, longevity, regeneration of cells and tissues, optimise physical enhancement, enhances rehabilitation of muscles, bone etc. While comparing modern aspect, it performs the action of immunomodulators. By acting primarily on the immune system like the macrophages, the simple chemical of herb through activating the cytokine network could produce all the action. The immunomodulators action of rasayana brings alteration in status of immune system. The benefits of immunomodulators are their ability to stimulate natural and adaptive defence mechanism. The word rasayana means those that brings about proper uptake, growth and improvement of essential vital dhatus and ojas. Also rasayana drugs are rich source of antioxidants.

CONCLUSION
The main aim of Ayurveda is maintenance of health through dhatusamya. Rasayana works at various levels in the body and overall result is the absolute state of vyadhikshamatva. It emphasise on the improvement of ojas rather the cure and destruction of pathogen. Rasayana drugs are not only immunomodulators but also have other effects such as immune stimulation, antistress, antioxidant, enhancing cellular detoxification mechanism, repair damaged cells including cell proliferation. So rasayana drugs should be used as a compulsory measure for immune deficient disorders.

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