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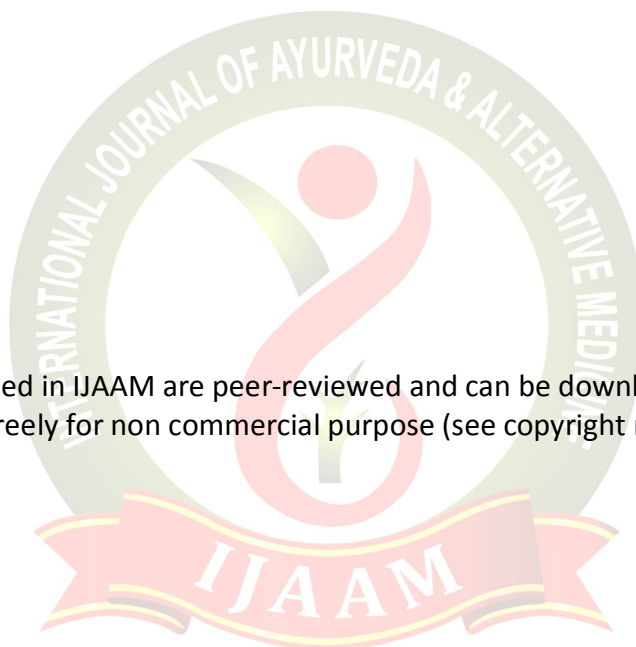
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IMMUNITY- A critical Review

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IMMUNITY- A critical Review**ABSTRACT**

The word immunity is not new for *Ayurvedic* fraternity, but it is well known, and explained in a lucid manner in *Ayurvedic* classics, if the *Ayurvedic* concept of *Vyadhikshamatwam* is well understood, Aids, Koch's etc are related to the *Vyadhikshamatwa* of *rogi* and will consider as stage wise development of Immuno-compromization. The idea of busting immune response is given by *Ayurveda acharyas* as *Rasayana*, *Vajeekarana prayoga*. Immune busting methods are well known nowadays, as Immunization through Vaccines. Vaccines are not at all the property of Allopathy system of medicine, but it is combined outcome of Micro biology and Bio-Chemistry, which are effectively working and serving public in preventing the horrible Viral infections worldwide, hence it is very essential thing to know about vaccine preparations, indications, presentation of different Vaccines, precautions to be taken while giving vaccines are discussed and for better understanding purpose, modern concept of Immunity also furnished in this article.

Keywords: *Vyadhi kshamatwam, Balam, ojus, Immunity, Vaccines & viruddhabhi samskruthi*

INTRODUCTION

General public knows *Ayurveda* as Preventive medicine than curative medicine, but people have wrong notion that *Ayurveda* have no vaccinations and not much talked about immunity and boosting methods, if properly gone through the available literature, in *Ayurveda* the concept immunity and boosting methods are well established, for easy and fast referring purpose this article thrown light and compiled necessary information from *Ayurveda* classics as well modern concept also interpreted accordingly.

In *Ayurveda* we have some technical words which are having similar meaning of to the immunity, they are

Vyadhi kshamatwam, Balam, ojus, urjas, viruddha satmyam, viryadabhi samskruthi, Etc.

In *Charaka samhita, sutrasthanam* 11th chapter, where *Charaka* says: "नच सर्वनि शरीरानि व्यधि क्षमत्वे समर्थानि भवन्ति"^[1]

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which means no two individuals are alike, in this universe, even if we take twins, they also varies in the different aspects, in specific they will differs in immune power, that is why *Charaka* has advised a physician should treat patient after complete examination, and he quotes like "पुरुषम् पुरुषम् वीक्ष्य कारयेत्"^[2] treatment will varies one to another individuals because they are differs from many aspects, no two individuals are same in this universe.

This variation is called as **bio-variation**. Even though the people are native of the same place, having same food and water the two people varies in the immune power, this bio-variation already identified by *acharyas* in the old back days even.

This immune power was also called as *Balam*.

"त्रिविधम् बलमिति सहजं कुलजं युक्तिजं"^[3]

The *Balam* was classified into three varieties *sahajam, kalajam* and *yukthijam*.

In the same context *Chakrapani* commented as

"व्याधिकक्षमत्वम् व्याधिबल विरोधित्वम् व्याधुत्पादक प्रतिबन्धकत्वम् इति यावत्"^[4] the *balam* is also called as *Vyadhikshamatwam* this *balam* again can be classified as *vyadhibala virodhitwam, vyadhiutpadhaka pratibhandakatwam*.

Vyadhibala virodhitwam: capacity of body to act against diseases.

vyadhiutpadhaka pratibhandakatvam: capability of preventing the diseases.

Ojus: regarding *ojus*, we have extensive explanation in our classics.

This is like *ojus* is nothing but essence of the *Saptha dhatus*, it enters the *Garbham* first along with *Rasa dhatu*, place of the *ojus* was *Hrudayam*, and it is pure and having *Pandu varnam* (**Rakatameeshat sapeetakam**), further *ojus* is of two types; they are *Para* & *Apara* *ojus*. *Paraojus sthanam* was *Hrudayam* and *Astha bindu matra pramanam*.

Apara ojus sarva deha gatam & *Ardhanjali pramanam*.

Ojovrudhi, ojokshya lakshanas:

"ओजो वृद्धिः तुष्टि पुष्टि बलोदयः"-^[5] The person who having good *ojus*, he looks satisfied and having good complexion and strong enough body.

[
Ojo kshyam is of three types, they are **Ojo visramsas, ojovyapath** and **ojokshyam**.

- "सन्धि विश्लेषो गात्रसदनम् दोषच्यवनम् क्रियासन्निरोधश्च भवति ओजोविसंसे" ^[6]
- "स्तब्ध गुरु गात्रता वातशोफो वर्ण भेदो ग्लानिस्तन्द्रानिद्रा च व्यापन्ने" ^[7]
- "मूर्च्छासाक्षयम् मोहं प्रलापं मरण मिति ओजोक्षये"^[8]

These are three steps of immune deficiency, stage wise development, AIDS now days it is not pronounced as AIDS, but as immune compromised host.

Ojo vardhaka or *bala vardhaka* or *kshamatwa vardhaka prakriyaas*:

The treatment procedure which enhances the *Vyadhikshamatvam* called *Kshamatwa vardhaka prakriyas*, they are nothing but **Rasayana** & *vaajeeekarana chikista*.

"लाभोपायोहि शस्तानाम् रसादीनाम् रसायनम्"^[9] -to or to get precious *dhatus*, taking *Rasayan* drugs that's it, there is no short cut or another way, and this is the only way. If *Prashasta dhatu* are derived he will also get *ojus*, because *ojus* is nothing but *Sapthadhatu saaram*.

Again *Rasayanam* is of three types mentioned by *Sharangdhara*:

Nimittika, *Ajasrika* and *Kaamyas rasayanam*-^[10]

➤ **Nimittika**: to get cure from different diseases, like *Chyavana prasha* for *Rajayakshma*.

➤ **Ajasrika rasayanam**: *Rasayana* drugs which are used daily basis, like

"क्षीर घृताभ्यसो रसायनानां" ^[11] -Charaka says *Ksheera* and *Ghrutam* if it was taken daily, it is the best *Rasayana dravyam*.

➤ **Kamyas rasayanam**: this *rasayanam* was taken as per the desire of the person, for example *Bramhi rasayanam*- usually taken to get good memory power for it.

In general, this three *Rasayanaas* are also called as

- ✓ **Kaamyas rasayanam**- Intentional *rasayana* therapy
- ✓ **Nimittika rasayanam**- as Therapeutic *rasayanam* and finally
- ✓ **Ajasrika rasayanam** as Preventive *rasayanam*.

Baala rasayanam: *Rasayana* therapy, which is given to the children called **Baala rasayanam**.

As usual, there is no difference between Adults and Children; both are getting diseases due to the vitiation of the three *doshas*, *dushyas* and *malas*.

"दोष दूश्य मलांश्चैव महताम् व्यायश्चये तयेव सर्वे बालानाम् मात्राल्पतया मता" ^[12]

Only thing is, the medicine was given in the smaller doses, so all the *rasayana* drugs are can be given in the smaller doses, among the all varieties, *Ajasrika rasayanaas* are best used for children, which improves the immune power of the child and prevents different infectious diseases.

Coming to **Nimittika rasayanam**: being concentrated preparations and used to treat different diseases, they are potent enough, hence better to avoid for children, in inevitable conditions one can give the same drugs with precautions and under all the supervision.

Common *rasayana* drugs used for children:

Balachaturbhada ras: *Shunti*, *ativisha mustha* are *Trikarshikas*, if *Guduchi* added it is called **Chaturbhada** or **Baala chaturbhada**, because it was best indicated to children, if we see the *phala Sruthi* of **Baala chaturbhada churnam** where he says: -

"ज्वर श्वास कास अतिसार बालाध्यखिल रोगनुत्" ^[13]

Next important drug should be discussed was *Ativisha- (Shishubhisajya)* it was given name called *Shishubhisajya*, because it is a capable drug, which can treat all the common occurring diseases.

Medhya rasayana drugs like *Bramhi*, *Mandukaparni*, *Swarnam*, *Yasthimadhu*, *Vacha*, *Guduchi*, *Mrudweeka*, *Ksheeram*, *Ghrutam*, *Pippali*, *Aragwadha*, *Vidangam*, *Eranda tilam*, *Shatavari* and *Madhu* etc drugs are best used as **Baala rasaayanaas**.

Vajeekarana drugs also commented as *Ojovardhaka* drugs because they can promote the *Sukra dhatu* in the body, being *Upadhatu* of *Sukra dhatu*, if *Sukradhatu* was increased automatically *ojus* also increased, hence *vajeekarana* drugs like: *Aswagandha*, *Kapikachu*, *Musali kadam* etc drugs are commonly used as **Baala vajeekarana** drugs for children.

Now let us skip into the physiology of modern science, what it says about Immunity.

World Health Organization: Defined Immunity as: the human body was having an ability to resist diseases called Immunity. The resistance power also called Defensive mechanism of the body. Some other scientists says Compensatory mechanism of the body is nothing but what we are calling as immunity of the body.

This immune power varies from person to person; there are two types of immunity in the body. ^[14]

1) Active immunity or Natural immunity (*Sahaja*).

2) Passive immunity or Acquired immunity (*Yukthi krutha & Kaalaja balam*).

➤ **Active immunity** or Natural immunity (*Sahaja*): this is nothing but *Sahaja balam*, which is given by **Inheritance** from parents. Like parent like children, if parents are potent enough children are potent enough, if they are not potent enough children also having the same potency of the immunity.

➤ **Passive immunity** or Acquired immunity (*Yukthi krutha & kaalaja balam*):

Actually this immunity was not there in the body by birth, but after birth child he / she developed.

In the I.U. Life, baby was grown in the all a septic conditions, after birth, baby was exposed to the infective organisms of the external atmosphere, after co-existing with these infective organisms gradually child will develop resistance against the same infective organisms, this type of exposure will happens right from birth to death, gradually he will develop this type of immunity, hence it can be compared with *Kaalaja* and *Yukthikruta balam*.

Based on the occurrence this *Balam* is of two types: Humeral immunity and Cell mediated immunity.

Humeral immunity: there are several Immunoglobulins, which plays major role in the Acquiring the Humeral immunity, out of them 5 Immunoglobulins are identified till today, and there are so many Immunoglobulins un identified yet, Known are IgE, IgM, IgA, IgD and IgG.

These are nothing but transformation of Plasma proteins.

Every immune globulin has its own function, like:

➤ **IgE:** Release of Hystamine in to the blood serum, when ever irritant organism or infective organism enters the body, these immune globulins alerts the body by producing Rashes, which are the results of the destruction of Mast cells, by the entry of the infective organism in the body, white blood cells used to come around the organism, and in the presence of the IgE immunoglobulins, white blood cells, liberates the Mast cells, these Mast cells destruction releases Histamines in to the blood serum, the condition called **Hay fever** (or) **Eosinophilia**, this can be diagnosed through the special laboratory examination called AEC (Absolute Esnophil Count).

➤ **IgM:** Production of suitable & strong enough Anti bodies in respective to the micro organism.

➤ **IgA:** Killing of the Bacteria by engulfing them, this is the Immuno globulin transfused through breast milk; remaining

Immunoglobulins are Trans placental immunoglobulins, transfused from mother to baby through Placenta, because its molecular size was very big, hence it cannot be transfused to baby through placenta, but through breast milk.

- **IgD:** Releases Lymphocytes on exposure of the infective organisms.
- **IgG:** Neutralization of the Endo-toxins released by different Bacteria, these are hypothetical functions of the different Immunoglobulins.

Cell mediated immunity:

This type of immunity was developed by Lymphocytes like T Lymphocytes, B Lymphocytes and Helper T. Lymphocytes.

Why they are named as T.Lymphocytes, B. Lymphocytes?

T Lymphocytes are initially develops in the Thymus, later these are developed in Bone marrow.

B. Lymphocytes are developed in Red bone marrow and liver.

T Lymphocytes are capable of Killing of infective micro organisms.

B Lymphocytes helps in Immune system through Phago-cytosis.

➤ Immune boosting methods:

Immunity which was acquired by different methods called Acquired immunity.

Two verities of Acquired immunity can be boosted by following methods.

Boosting method of Cell Mediated Immunity: can be boosted by giving different Vaccines, these vaccines are two types: [15]

- 1) Directly contribute in the improving of the immunity
- 2) They help for the better functioning of Cell Mediated Immunity.

For example: Anti Tetanus Serum (A.T.S) given to treat the Tetanus, after establishment of the pathology of Tetanus, i.e. directly acting vaccine. Inj T.T is given for the preventive purpose, i.e. improving the Cell Mediated Immunity.

Boosting method of Humeral Immunity: Supplementing the different Immunoglobulin's,

which are can be transfused to the body, in the market several pharmacies preparing artificially the immunoglobulin's from different animals, which are directly transfused therapeutically, in common Gullen Berry Syndrome, Shock if needed they are transfused, but it is a very costly treatment as poor people cannot go for this treatment.

Immunization schedule & sample presentation:[16]

World Health Organization proposed Immunization schedule is as follows:

Two Tetanus Toxaoid doses given to the mother, in the antenatal period, one is on the 5th month of pregnancy and second dose on 7th month of pregnancy, this initiating vaccine in common given to child first time through mother.

Soon after delivery 1st to within the 3 days→ B.C.G and O.P.V are given in some books it was mentioned as "0" dose.

- ✓ On the 6th week→ D.P.T1 → O.P.V1 → H.B.V1.
- ✓ 10th week → D.P.T2 → O.P.V2 → H.B.V2
- ✓ 14th week → D.P.T3 → O.P.V3→ H.B.V3.
- ✓ 9th month → Measles.
- ✓ 12th-15th month → M.M.R.
- ✓ This on words the vaccines doses given called booster doses, except O.P.V.
- ✓ 18th month → D.P.T1st booster → O.P.V4th → H.B.V1booster dose.
- ✓ 5th year → D.P.T2nd booster → O.P.V5th.
- ✓ 10th year → TT booster dose.
- ✓ Apart from that Typhoid vaccine was advised on the second year.

Presentations of the different vaccinations: [17]

Vaccines are bio-chemical products of infective organisms, but in the stage of inactive form. In which stage, human body can easily prevent pathological schedule of the same.

➤ B.C.G: (*Bacillus calmette Gurin*).

Live attenuated Vaccine, sample presentation was dried power in a pet bottle along with 2cc normal saline water, this pet bottle was sealed with black paper to protect from light, in case it was exposed to light, that should be discarded, because it will become deactivated.

One sample will be enough for 20 children, because dose should be given at **0.1ml- I.D** (intra dermal), once it was opened the sample, it should be utilized within the same day, hence in the government hospitals they will fix one day in week days to give BCG vaccination.

Site of the BCG vaccine: throughout the globe, doctors following to give the injection on a particular site to identify the children who have taken the BCG vaccine. Site of the BCG vaccine injection was **Left deltoid**.

This injection induces a papule because of its irritating nature, and within the 3 weeks it forms a scar, over the site of injected, sometimes it may cause fever.

This is the vaccination, called incomplete vaccination, because even though children are vaccinated, if they exposed to the T.B patients and T. Bacteria, children will get affected, hence it is called incomplete vaccination. So even though children are immunized with **BCG** vaccination, they should not move close with T.B patients.

But BCG vaccination initiates the Immune response to elevating the organism (congestion, consolidation, cheesy, cavitations, and Fibrosis.) and prevents the spreading of *Mycobacterium tuberculosis*.

- O.P. vaccine: to prevent polio, live attenuated vaccine.

Dose: two drops- mode of administration oral.

Polio effected children also need to be given OPV.

First 4 doses, can be taken from the nearby the P.H.C (local), i.e. 0 dose, 6 weeks, 10th week and 14th week doses, after that yearly twice National Polio Eradicating Program me, sponsored by central government, conducting camps, from where one can get this vaccinations with free of cost.

Irrespective of the schedule one can give the vaccines for the children.

- DPT: Diphtheria, Pertussis and Tetanus, this is an example for triple antigen.

Dose: 0.5 ml, Mode of administration: I.M.

Complications: Sometimes it may cause abscess at the site of injection, which may requires the procedure called I&D.

- Measles: live attenuated vaccine, dose was 0.5 ml S.C (sub cutaneously)
- MMR: inj 0.5ml S.C (sub cutaneously).
- TT vaccine: 2cc inj deep Intra Muscular.
- Hep B-inj 0.5ml S.C.
- Rabies vaccine: to prevent Rabies, usually taken after inoculation of the infective organism, within 12 hours, according to advice of the Bio-Chemist and pharmacist, will give the schedule on the each and every sample, one should follow the same schedule. This schedule was like 0dose on the first day, second dose on 3rd day, third dose on 7th day, and 4th dose on 14th day like that, the schedule varies from one pharmacy preparation to another.

Precautions should be taken: [18]

- One should maintain Cold chain system: all vaccinations require +2 to 8°C temperature, and for the long term storage purpose, vaccines are stored at 0°C.
- At main center, this system consists of Cold storage or refrigerators specially designed for storing vaccines, usually residing in the district head quarters.
- Health assistants (paramedical people), they used to collect the vaccines from the district head quarters and goes to school children, for that purposes they use thermo-cool small boxes or flasks etc and they will distribute vaccine to the children.
- In this system vaccines are protected and distributed where the vaccines are in the active form, in case and group of vaccines failed to store properly in the cold chain system, they will trace that group and those are discarded.
- The total cold storage, health assistants, thermo cool boxes and flasks etc all are combinedly called as cold chain system.
- As per the rules and regulations of the National immunization programme:
- 9th month measles vaccine was given along with one lacks of Vitamin A.
- For immune compromised host, or children: BCG, MMR, DPT and OPV vaccines are not given, because they are live attenuated

vaccines, (Dead vaccines can be given like HeB.).

- If any child suffering with any of the disease except immune compromise host, like fever, febrile convulsions, Gastro entities, Asthma & Cholera etc any diseases these vaccines can be given (no doubt about the action of the vaccine, it does its action of producing the immune against the so called disease.).
- At a time or in a same day one can give any number of vaccines but one dose to another dose one month gap should be given.
- Taking of excess dose, may not cause any advantage (extra immune power), that will be like pouring water for the plants, even it is raining, instead some time it may causes symptoms of Gastro-enteritis.

MATERIALS METHODS:

Ayurveda says classical way of Immune-boosting methods like *Agnikarma*, celebrating the milestones etc, in modern era, the lifestyle and the procedures of immune-boosting methods also changed, O.P.Ghai author of Essential pediatrics, a famous reference book for pediatric practice, explains the immunization schedule, The short textbook of Pediatrics by Suraj gupte also explains the immunization schedule and presentations of the different vaccines introduced in a lucid manner. Cell mediated immunity, classification of lymphocytes based on the origin like B lymphocytes, T lymphocytes, when body is in deficiency of the same the transfusion of the immune-globulins etc topics of the concept is delineated in a practical way. [19]

Text book of paediatrics by Nelson 15th edition, edited by Richard E. Behrman, kliegman and Arvin, gives a clear-cut idea of vaccinations and their applications explained.

The book "Essentials of medical microbiology" by Rajesh Bhatia, Pattan lal ichhpujani, says two doses of T.T in antenatal care and their importance is highlighted, as the topics of the concept is explained in various textbooks, a humble trail is made to compile and help the medical professionals in this paper.

RESULTS:

after referring all the available literature on different immune boosting vaccines and their coverage on the particular infectious diseases, it is can be advised that, following the immunization schedule will help to human body at any time to face the different infections successfully.

DISCUSSION:

Still there is a big confusion in giving and taking vaccinations for few children, who is immune-compromised, suffering from diarrhea, fever at the time of vaccination, and many vaccines are said to be an incomplete vaccines, even though, the vaccines if given to the individuals, they have to take care of themselves in preventive aspects, best example is B.C.G vaccine, even after taking the vaccine if the person is exposed to the droplet infection of Koch's (Tuberculosis) patient, there may the chance of getting infection of tuberculosis, as the vaccine is incomplete one.

CONCLUSION:

"एकं शास्त्रमधीयनो न विद्यात् शास्त्रविनिश्चयं

तस्मात् बहु शृतं शस्त्रं विजानीयात् चिकित्सक" [20]

Susrutha says a doctor should make best use of all contemporary sciences, as the immune busting through vaccinations is the knowledge of Microbiology and Bio chemistry, if the doctors have proper knowledge of the sciences, he will be called best care taker of the patients otherwise he will be blamed in this world. It is also given importance to have a practical knowledge over which, so that he can better use of vaccines. If all the practitioners have good knowledge over the concept Immunity and boosting methods, it is possible that Health for all and can cater the best health care services.

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