**ABSTRACT**

In present day world, with outbursts of novel bacterial and viral diseases and weakening of the human race due to polluted environment, it is a necessity to understand Balya karma of Ayurveda which refers to substances those are beneficial and tend to increase or enhance Bala of an individual, as a person having adequate Bala/ strength is less likely to get affected by diseases frequently. Although some related work has been done, but complete review is not available yet. Hence, an effort has been made for same so that critical analysis of the matter could be done to bring out fruitful conclusion which may be utilized for the benefit of mankind. Bala was found to be a state of anatomical and physiological excellence. Balya dravya execute their Balya karma by producing Doshha saumya, Vahini saumya and Dhatu pushti. While many factors affecting Bala are beyond the scope of physicians, but it is possible to manipulate the others. Yuktriyapashraya chikitsa may be utilized to enhance Sahaja bala through lifestyle management during pregnancy for enhancing the bala of the next generation, and yuktikritta bala through administration of Balya dravya (Ahara as well as Aushadha), Balya karma (Exercise, Yoga, etc) and psychic counselling (to promote satva bala). The concept of Balya karma and the pharmacodynamical properties of Balya dravya may be utilized to enhance the Bala in general or of some particular system/ organ as per the need of the situation which may help to build strong man power and a strong nation.

**Keywords:** Balya karma, Ayurveda, Strength promoters, Immunity

**INTRODUCTION**

Karma is one of the saptapadartha of the branch Dravyaguna of Ayurveda which is the factor responsible for the Samyoga (Association) and Vibhaga (Dissociation) of Dravya and is accomplished by Rasapancaka. Balya karma has been categorized under Sarvadhatuka karma. In the present day scenario, where every younger generation is weaker than the previous one and disease presentations by new bacteria, viruses, etc every now and then viz. ebola, dengue, chikungunya, etc. is occurring; it is the need of the hour to understand the Balya karma of Ayurveda defined as “Balaya hitam balyam” which refers to substances those are beneficial and tend to increase or enhance Bala of an individual as Caraka has stated that only Bala is capable of defying Doshha.

Since ancient times, sages did all efforts to increase bala. It is equally important in present era as body is sustained properly through bala only. Morbific elements prosper in some indispensable favourable conditions and increase the susceptibility to the disease. Absence of these conditions lead to sustenance of the body by Bala. This can be analogised to vedic concept that seed sown in non- fertile soil will be destroyed just like fire put up in a fuel less or airless place ceases.

Although some work has been done on the subject but complete review has not yet been done. Hence, an effort has been made for the same so that a critical analysis of the matter could be utilized to formulate the guidelines for enhancing bala of the masses.

Ayurveda classics and their commentaries along with the modern correlations were studied and analyzed thoroughly. The collected data was utilized to draw meaningful conclusions.

**CONCEPT OF BALA**

Classical references regarding bala and related commentaries elucidate four distinguishing but intermingling and complementary notions explaining the physiological basis of bala in Ayurveda:

(A) Bala (Physical Strength) which can be assessed from the capability of doing physical activities like lifting of weights, etc.

(B) Ojas (Vitality) which is the essence of all seven dhatu and is responsible for liveliness.

(C) Vyadhisakravatva (Immunity) i.e. resistance to diseases which helps in preventing and curing diseases.

(D) Veerya (Shukra = semen)

Though, it is strenuous to make a clear distinction between the above four, insightful commentators have clarified these concepts well as discrete entities.

In the context of bala and ojas, although textually both Caraka and Susruta points at oneness of both but, when subtle meanings are sought one can work out conclusive difference between these. Cakrapani elucidated it by suggesting that from a generalized and broad point of view both ojas and bala can be regarded as one and same but strictly speaking these are discrete entities ‘balahetuta prakarsha bala pada saha vachyata, na tu paramarthato bala balmaveya ojah’. This conception is also supported by Dalhana ‘paramarthatustu balajasorbeda eva’. Dalhana has further given definite distinguishing parameters of both bala and ojas by attributing rasa, guna and veerya to the latter while bala lacks these.

The firm line is drawn by the words of Cakrapani, who propounds that ojas is the seat of bala - “sa(bala) ca prayah ojah sanshraya”.

Hence, bala (ashrayee) is different from ojas
(ashraya) on account of ashraya - ashrayee concept. It may also be considered that Ojas is the cause or mass and Bala is the effect or energy.

Therefore, from the ongoing discussions it can be inferred that bala and ojas are separate but not mutually exclusive rather inter-dependent and complementary entities possessing different physico-chemical characters and consequently have different criteria of assessment.

The assumption of bala as vyadhikshamatva or immunity can be clarified by apprehending bala rendering the body to overwhelm the aetiological factors of the disease, which can be accounted to be a function of ojas. Therefore this concept can be inferred as an applied facet of ojas. Maintenance of health entirely depends on ojas.

**Bala vis a vis Bala**

Bala helps us to grow, undergo and withstand both physical and mental stressful conditions and represents potential source of strength and power to oppose decay and illness. Hence, Bala is characterized by following:

1. Shakti lakshana bala: Assessed by the capacity of doing work, adaptability for the tolerance of pain, stress and resistance to diseases (Vyadhikshamatva).
2. Upacaya lakshana bala: Balakriti is explained as Pushkritiki pointing at oneness of Bala and Pushhtik which means Upacaya (growth of the body). Assessed by build up, stability and compactness of the body.
3. Usaha lakshana bala: Alpabalarvan is explained as Usabhaniti pointing at oneness of Bala and Usah which means ability to perform the work in unfavorable conditions.
4. Ojas lakshana bala: Balahaniti is explained as Ojas hani pointing at oneness of Ojas.
5. Bala is the capacity to perform physical activities.

**Types of Bala:** Three types are assigned to bala viz.:-

1. Sahaja (Congenital): It is also termed as prakriti (innate/ natural/ inborn/ native/ genetic/ inherited) and exists right from the birth. Cakrapani says that it causes “hetvanta nirpeksha dhaturvidhi” i.e. increases dhatu independent of any other factor. It may be considered of three types viz. Species specific, Racial specific or Individual specific. He further explains that it is pre-decided for an individual depending on the condition of pumbeeya (sperm) and strebeeya (ovum) as Ayurveda considers the origin of prakriti at the time of conception.
2. Kalaja (Time and age induced) (a) Time induced (Nityaga kala):
   (i) Seasonal variation:
   Daurbalya – Varsha, Greeshma
   Madhya bala – Sharada, Vasanta
   Shreeshtha bala – Hemanta, Shishira
   (ii) Diurnal variation may also be considered
   Poorvahana - Predominance of Kapha, has Uttama Bala, Madhyahana - Predominance of Pitta, has Madhyama Bala, Aparahana - Predominance of Vata, has Heena Bala
   (iii) Similarly nocturnal variations may also be considered.
   (b) Age induced (Avasthika kala):
   Bala increases during Balavastha (Madhyama Bala) Reaches maximum in Jivavastha (Uttam Bala) Decreases during Vridhavastha (Heena Bala)
   It has been considered in Vaya of Dushavidha Pareeksha.

Yukrikta (acquired i.e. conditioned by diet, exercise and medication).

Factors affecting it are:

(a) Ahara – Intake of nutritious food.
(b) Ceshta – Actions.
(c) Yogaja – Rasayana, Vrishiya, Balya dravya, Ojovardhika, Vaiseekara Yoga, some yogika procedures.

Of these three, congenital and time induced bala are beyond the scope of physicians as they are resistant from human modifications being contributed by matrija, pitrija bhavas (genetical factors), datta, seasonal and age influences respectively whereas the acquired bala comes under the realm of physicians and can be modified by favourable and rational dietetic, exercise and medicinal regimen. This comes under the domain of yuktiyapashraya cikitka. Congenital bala of the upcoming generations may also be increased through following garbhnii paricharya (dietary and behavior rules to be followed in pregnancy) properly.

Another classification of Bala is also available in Caraka Samhita:-

1. Deha bala (Physical capability): Cakrapani says it to be merely related to the body. Yogbhatta embraces sahaja, kalaja and yukrikta as three types of dehabala. Dalhana gave the following characteristics-
   (a) Utsaha lakshana dehabala: One who can perform the work in unfavorable conditions too.
   (b) Upacayalaksana dehabala: Healthy body built up, stability and compactness of the body.

2. Agni bala (Capacity of digestion): Ayurvedyeya shabdakosa, 14 Part: It is a combined out turn of all jatharagni, bhootagni and dhatavagni. Jatharagni is the root cause of all these agni which is verified by Caraka who says that Dehnagi is responsible for ayu, varna, bala, svashiya, utshaha, upacaya, prabha, ojas, teja, all other agni and prani. It is of four types according to intensity viz. Teekshnagni, Mandagni, Samagni and Vishamagni and of three types according to Ahara matra (Quantity of food ingested and digested without any complications) viz. Utkrishta, Madhyagunya and Alpa.

3. Satva bala: Strength of Satva or manas is known as satvabala or manobala which is also termed as utshaha. According to Monier Williams Sanskrit Dictionary ‘Utsaha’ refers to ‘strength of will’. Hence, it is the ability to perform the work willingly with full efforts and without any complications. Body follows psyche and vice versa. Hence, decreased satvabala leads to decreased shareera bala.

4. Vyadhibala: Cakrapani says that Vyadh is one which produces various types of pain. The strength of a disease is called vyadhibala which is inversely proportional to atarabala. According to severity, it is of two types i.e. Meidaa Daruna or of three types i.e. Pravaraa Madhyaa Avara Vyadhibala.

**Factors determining Bala**

1. Jati (Race)
2. Kula (Family)
3. Desha (Ecology) – It may be divided into 3 parts:
   (a) Jangula Desha (Dry land) – Uttama Bala
   (b) Asora Desha (Marshy land) – Alpa Bala
   (c) Sadharana Desha (Normal land) – Madhya Bala
4. Kala (Time factor) (Nityaga kala) – Divided into two i.e. Adanaka and Visargaka according to Bala of individuals and Sanchaya, Prakopa and Prasara of different Dosh.
5. Vaya (Age factor) (Avasthika kala)
6. Pratyatmaniyata (Individual specific)
Balavridhikara Bhava

1. Balavatapurusha deshe jannua: Birth in a place which promotes enrichment of Bala eg. individuals born in Sindhu desha are more balvana.
2. Balavatapurusha kale: Birth in a favorable time for eg. Visarga Kala, Poorvarahu.
3. Sukhashcha kalayoga: A sansatara consists of six ritu each having its own characteristics, which being in normal/ natural condition are termed as kalayoga-sukha.
4. Beejakshetraguna sampata: Superior genetic material and advantageous internal environment in the uterus for conception.
5. Aharasampat: Proper antenatal care through better nutrition to mother resulting in better growth of foetus. Anna is the best in shareera shtitikara bhava. Bala depends on Anna/Ahara.
6. Shareerasampat: It refers to sadguyam of shareera gunas which may be taken as susamhata (excellent compactness of body) and pramanavat (proportionate relation of different organs in angula pramaana) shareera as both are capable for good strength. Healthy mother with well-built physical constitution will render shareerasampat to the child.
7. Samyasampat: It means acceptance for all substances and no hypersensitivity against anything. It is also enumerated in dashavidha pareeksha of Caraka.
8. Satvasampat: Good mental health and efficient dealing with the surroundings and stress. Satva guna pradhana individuals are lacking chinta, shoka, bhaya, krodha and dukha which is a favourable factor for bala (shakti and upachaya).
9. Svabhavasansiddhi: As per Cakrapani, svabhava sansiddhi indicates balanajaka karma sansiddhi inferring the application of karnas which offer strength viz. vyayama, abhyanga, etc. Gangadhara considers svabhava to be inherent quality of different persons for having varied amounts of bala and gives instance of lion who possesses the capability of fighting with bigger animals like elephant also. It may be considered as innate or genetically transferred resistance power as per modern parlance.
10. Yauvana: Acharya Caraka elucidated age as condition of the body depending on time which is primarily of three types – bala, madhya and jeerna. Here, madhyama avastha is characterized by proper shareerikaa and manasika bala, veerya, paurasha, para-kramrau with all dhatu exhibiting their quality at the best.
11. Karma: Cakrapani clarifies karma as vyayamadhi karma and karmabhyasa as the root cause for producing bala. Gangadhara denotes karma as balakara karma which suggests that actions enriching bala are termed as karma. Concept of yuktikritabala is understood here which incorporates bala enhanced due to regular exercise.
12. Sanharsha: Caraka quoted ‘harsha’ as ‘preenunanasaam’ and ‘shoka’ as ‘shoshananaam’ implying that pleasant mood is best among saturating factors and grief is best among emaciating causes for the body. Gangadhara took sanharsha as cheerful disposition.

Apart from these, some other balavridhikara bhava are Nidra Sampat, Brahmacarya, Dosh Sampat, Dhatu Sampat, Mala Sampat, Agni Sampat, Bhashaja Sampata, Dinacarya, Ritechara Pavanam, Hit sevan and Ahit Parityagvam, Acharya Rasayana, Sadhviya paalun. Acharya Bhavamishra defined Bala vridhikara dravyas as those which produce Doshha saamya, Yahiin saamya and Dhatu pushi.

Bala vis a vis Oja

It is the substantial entity of the body responsible for the integrity of structure and function of all the tissues and for strength and vitality of human body.

Bala vis a vis Vyadhi

In Ayurveda, vyadhi is illustrated as the power of resistance capable enough to check the progress, occurrence or recurrence of diseases.

Caraka has further described two types of individuals: Ayuddhisaha vyadhi aksamathava (Persons incapable of resisting diseases) and Vyadhisaha vyadhi kshamathava (Persons capable of resisting diseases) both of which are just opposite to each other.

Cakrapani quoted two types of vyadhidhamanu:

1. Vyadhibalaviradih kshamathava – Destroys the disease which has occurred. May be correlated with Yukkrita bala or artificial immunity of acquired immunity.
2. Vyadhyutpad pratibhandhaka Kshamathava – Doesn’t let the Vyadhi to evolve. May be correlated with Sahaja bala or innate immunity.

Vyadhi kshamathava is affected by factors viz. Ojas, Bala, Ritu, Ahara, Anupana, Rasa, Jatakarma, Karma-vedhana, Lehana karma, Susvaram prashana, Dhooopana karma and Drugs.

Veerya

Veerya (Shukra – semen) is quoted as the best strength promoting factor. It literally means the 7th Dhatu Shukra which is considered as the final outcome of food in the most purified form as it has no Malaa described in the texts. Normal physiological process of digestion starting from Jatharagnipaka to Dhatuagnipaka results in production of purest Shukra Dhatu which indicates normalcy and excelency of preceding 6 Dhatu resulting in general fitness with a firm and muscular body.

MANIFESTATIONS OF BALA IN PURUSHA

Bala is manifested in humans by:-

1. Sthiropachita mamata i.e. well developed and firmly muscular body
2. Sarva cheshthashu apratighatah i.e. unobstructed and smooth performances of every action
3. Svarvarna prasada i.e. clarity of voice and enhanced complexion
4. Banyanaah abhyantaranaam ca karannamatmakarya pratipatti i.e. normal and efficient functioning of external (motor) (Karmendriya), internal (sensory) (Jnendriya) organs and manus (mind).

Cakrapani and Dahana are certain in anticipating the word mamta as symbolic representative of all seven dhatu. Thus bala gives stability and firmness by nourishing all the dhatu.

Cakrapani defined Cheshtha as only physical activities whereas Dahana accepts mental and vocal actions as well. As per Dahana, the unobstructed performance of these activities can be accredited to the karma sadhana shakti or bala. This standpoint is further reinforced by Shukrata who states that a person having adequate bala is capable of all his activities without hindrance.

One with adequate bala is characterized by:-

1. Samamamsa pramanam
2. Sama samhanana
3. Dridhindriya

Samamamsapramana is characterized by the ability to tolerate hunger, thirst, heat, cold and exercise and timely digestion and metabolism of the ingested food.

ASSESSMENT OF BALA (BALA PAREEKSHA)

The state of an individual’s Bala can be understood through two Lakshana: the first is Upacaya, which means the built, stability, and compactness of the body, and second one is Shakti, which refers to the capability to do hard work.

Caraka Samhita explained the assessment of Bala as per Vyayamashakhti. He further says Vyayamashakhti is assessed by karmashakhti i.e. capacity to do work.
Bhavamishra directed to assess bala through ‘cheshtaputvatva’ and not by ‘sthayuva’ or ‘karshya’.

All the above mentioned characteristics of Bala are taken into account by Acarya Caraka in his Dashavirdhita atura pareeksha amongst which, vikritidh vareeksha is utilized for atura doseha bala pramana through Hetu, Doshha, Dosha, Prakriti, Desha, Kala, Bala.

Rest of the nine examinations are for Atura bala pramana (Bala of patient) which are incorporate in the present study for assessing bala and are as follows:

1. Prakriti (constitution): Prakriti is formed during Garbhotpatti according to Doshadikhya. Samadoshaya Prakriti is the best. Ovanvaya Prakriti have Madhya Bala. Ekadoshaya Prakriti is Nitikshita. Among Ekadoshaya Prakriti, Shleshma Prakriti has Shreshtha Bala, Pittala Prakriti has Madhyam Bala, Vata Prakriti has Alpa Bala.

2. Sara (excellence of dhatu or tissue elements): Increase or decrease in the quantity of dhatu (body elements) leads to diseased condition. Dhatu present in their purest form produce strength and vitality in the body, the condition being known as dhatu sarata. Eight types of Sara are mentioned for knowing Bala of individuals viz. Tvaksara, Raktsara, Mamsasara, Medasara, Asthishara, Majjasara, Shukrasara, Satvasara. Kashyapa also mentioned Ojas sara, which has not been incorporated in the present study. On the basis of Sara, Bala is diagnosed and 3 types of individuals are seen:-
   (a) Sarvasara (Pravara bala) – Having all types of Sara
   (b) Asara (Avara bala) – Don’t have symptoms of any of the Sara
   (c) Madhyasara (Madhyama bala) – Symptoms of some Sara are present while some are absent.

3. Samhana/ samhhati/ samyojana (compactness of organs): It is used to examine physical built and compactness of the body and is of 3 types i.e. Susamhata Shareera, Asamhata Shareera and Madhya Samhata Shareera which are Balvana, Alpa Bala and Madhyam Bala respectively.

4. Pramana (measurement of the organs of the body): Caraka and Sushruta have laid down the Pramana (Utsedha, Vistara, Ayama) of various Anga Pratyanga in Anguli Pramana for examining physical Bala and Ojas. Sama Pramana Shareera has measurements according to classics and is bestowed with Deergahya, Bala and Ojas. Vishama Pramana Shareera has measurements different from classics either less or more and Bala, Ojas, etc. also varies accordingly. Vishama Pramana may be Adhika or Heena and is nindya.

5. Satmya (homologation): It indicates the things which are even otherwise harmful to body in general, but show wholesome effect due to constant usage. Acarya Caraka mentioned Dravyatath satmya (refers to usage of ghrita, ksheera, taila, mamsarasa); Rasatah satmya (refers to satmyata to six rasas) and Gunatah satmya (refers to usage of Ushna, Sheeta, Drava, Shushka, Snigdha, Rooksha, etc. food materials).

6. Satva (psychic conditions): It is classified into three types of Satva for examining Manasika Bala :-
   (a) Pravara- Uttama Manobala (Individuals having Pravara satva are sattvasara)
   (b) Madhyama- Madhyama Manobala
   (c) Avara- Heena Bala

7. Aharashaki (Power of intake and digestion): Aharashaki reflects the agnibala and is examined through Abhyavaharanara Shakti (power to ingest) and Jara Shakti (power to digest). It is of three types according to Bala.
   (a) Pravara – Agni Tseeksha or Sama, Uttama Bala, Deergahya
   (b) Avara – Agni Manda, Nirbala, Alpayn
   (c) Madhyama – Agni Vishama, Madhyama Bala, Madhyama Ayu

8. Vyayamashakti (power to perform exercise): It is used to examine bala and is examined with reference to karmashakti i.e. one’s ability to perform work through which three types of bala is estimated. Cakrapani explained karmashakti as the capability to lift weights.

9. Vaya (age): Age is broadly classified according to bala.
   (a) Balyavastha – Madhyama Bala as essence of dhatu is not formed in proper quantity.
   (b) Vaavanavastha – Pravara Bala as maturity of dhatu has been achieved.
   (c) Vridhavastha – Low Bala due to predominance of Vata and degenerative changes.

Hence, this pareeksha is an integrative approach of various multidimensional factors viz. genetical, anthropological, physiological and psychological parameters responsible for Bala.

**MANAGEMENT/ INCREASE OF BALA THROUGH BALYA DRAYA**

- Aindree, Rishabh, Aitarsa, Rishyaprotka, Payasya, Ashvagandha, Shhira, Rohini, Bala, Atibala
- Vidareekanda, Pakva Amra, Vatada, Abhushika, Akshoda, and Kukkuta Manasa
- Laghupanchamoola
- Kukkuta Mansa is the best Balya dravya
- Shameedhanya varga – Masha
- Taila varga -Tila taila
- Kriitana varga = Sattu – Sadyo Balavardhaka

**TYPES OF BALA ACTION**

Prof. P. V. Sharma divided the Balya action into two categories. Some Dravya are Balya in general and some are Balya for some specific organ for eg, Kapikacchu, Shatavaree, Bala, Atibala, etc increase Dhatu bala in general. Balya dravya for particular system or organ are as follows: Katuake- Yakriti balya, Arjuna- Hirdaya, Brahme– Medhya, Tagar– Naadee sansthana, Kupkeelu– Sushumna, Tikta Dravya- Amashay.

Dr. Vishvanatha Dwivedii also says Balya drugs can be classified as General tonics, Haematinics, Stomachics, Intestinal tonic, Nerve tonic, Cardiac tonic, vascular tonic, Flesh tonic, etc.

**MODERN REVIEW**

Sir M. Monier Williams Sanskrit English Dictionary depicted Bala to be indicative of Strength (quality of being strong or powerful as it relates to muscular activity), Power (Rate at which work is done which may be calculated by multiplying force and velocity), Vigor (Active force or strength of body or mind), Capacity (potential ability to contain or to hold, the power to do something or ability to perform mentally), Vitality (That which distinguishes living things from non- living things or State of being alive), Energy (capacity of a system for doing work and is manifested in various forms viz. in form of motion in kinetic energy, in form of position in potential energy, in form of light, heat, ionizing radiation or sound etc.), Force (that which changes or tends to change the state of rest or motion of a body).

**THE CONCEPT OF BALA, IN RELATION TO MEDICAL SCIENCES**

It could be interpreted at 3 levels viz.:-

1. **Physical capability**/ Kriyamakra Bala (Balam kriyasamayat)
   About 40% of the body is skeletal muscle, and perhaps another 10% is smooth and cardiac muscles. Means about 50% of whole
body (w/w) is its muscular part which is mainly responsible for shape, movement, covering and protection (to inner organs) etc.

Energetics of Muscle Contraction:- When a muscle contracts against a load, it performs work. This means that energy is transferred from the muscle to the external load to lift an object to a greater height or to overcome resistance to movement. In mechanical terms, work is defined by the following equation:-

\[ W \text{(work output)} = L \text{(load)} \times D \text{(distance of movement against the load)} \]

The energy required to perform the work is derived from the chemical reactions in the muscle cells during contraction.

Sources of Energy for Muscle Contraction:-
1. The first source of energy that is used to reconstitute the ATP is the substance phosphocreatine, which carries a high energy P-bond similar to the bonds of ATP.
2. The second important source of energy, which is used to reconstitute both ATP and phosphocreatine, is “glycolysis” of glycogen previously stored in the muscle cells.
3. The third and final source of energy is oxidative metabolism. This means combining the oxygen with the end products of glycolysis and with various other cellular foodstuffs (carbohydrates, fats and proteins) to liberate ATP. More than 95% of all the energy used by the muscles for sustained, long-term contraction is derived from this source.

2. Immunity (Vyadhikshamatva)77

“The health of an individual is due to Bala, whose other name is Ojas also. If the body is afflicted by different pathogenic organisms and other stresses, one cannot remain healthy i.e. the Ojas gets disturbed or deranged. Therefore, the Bala is directly responsible for the prevention, inhibition and arrest of the factors that cause the diseases, their virulence and strength” – Introduction to Kaya Cikitsa by Dr. C. Dwarkanath.

In Medical Science these functions of Bala are to be considered under the dimension of Immunity which is the ability to resist almost all types of organisms or toxins that tend to damage the tissues and organs.

Also, in context of vyadhikshamatva, Ojas (Bala) may be correlated with the immunoglobulins/ antibodies which are glycoproteins produced by the plasma cells (derivatives of B lymphocytes) and are found in serum and tissue fluids. Most higher mammals possess five distinct classes of immunoglobulin molecules viz. IgG, IgA, IgM, IgD, IgE. Ojas and immunity are comparable as both provide immunity; are present in equivalent quantity (Apara ojas being ardhanshali or 96 g approximately equal to the total amount of immunoglobulins) and circulate in the body as a part of blood. Also, ojas is produced at very first among living beings just like the most abundant immunoglobulin IgG is also found in foetus by crossing the placental barrier which closely resembles the definition laid down in Ayurvedic texts, more than 3000 years ago84.

To summarize, bala facilitates development of a well and firmly built body, helps in effective and smooth performance of all activities, renders the motor and sensory organs to perform their respective functions without hindrance and ushers in well-being. It is characterized by capacity of the body to work, to resist disease and infection and to resist the stress imposed by such factors like heat, cold, atmospheric pressure changes and accelerative forces of jolts and vibrations. It, therefore enables an individual to dominate his/her usual environment.

3. Genes/ Niyantaratanamaka Bala (Beejabhagayavana)81

“The basic functional unit of heredity located at a definite focus on a particular chromosome.” [Oxford and IBH New Medical Dictionary] The nucleus is the control center of the cell (unit of all living beings). The nucleus contains large quantities of DNA, which are the genes. The genes determine the characteristics of the cell’s protein, as well as the intracellular enzymes that control cytoplasmic and the nuclear activities.

These genes control hereditary from parents to children, also control day to day function of all the body’s cells. The genes control cell function by determining which substances are synthesized within the cell – which structures, which enzymes, which chemicals. Each gene, which is a nucleic acid called deoxyribonucleic acid (DNA), automatically controls the formation of another nucleic acid, ribonucleic acid (RNA); this RNA then spreads throughout the cell to control the formation of a specific protein. There are more than 30,000 different genes in each cell. These genes control and promote reproduction of the cell itself. Some of the nuclear proteins are structural protein, which in association with various lipids and carbohydrates form the structures of the various intracellular organelles. The majority of the proteins are enzymes that catalyze the different chemical reactions in the cells. For instance, enzymes promote all the oxidative reactions that supply energy to the cell, and they promote synthesis of all the chemicals, such as lipids, glycogen and adenosine triphosphate (ATP).

Extraction of Energy from Nutrients: This is the specific function of the Mitochondria (powerhouse of the cell). The principle substances from which cells extract energy are foodstuffs (Ahara-Dravyas) that react chemically with oxygen – carbohydrates, fats and proteins. In the human body, essentially all carbohydrates are converted into glucose by the digestive tract and liver before they reach the other cells of the body. Similarly, proteins are converted into amino acids and fats into fatty acids. Inside the cell, the foodstuffs react chemically with oxygen (Samana-Vaya), under the influence of enzymes that control the reactions and channel the energy released in the proper direction. Almost all the oxidative reactions occur inside the mitochondria, and the energy that is released is used to form the high-energy compound ATP. Then, ATP, not the original foodstuffs, is used throughout the cell to energize almost all the subsequent intracellular metabolic reactions.

Uses of ATP for Cellular Function: Energy from ATP is used to promote three major categories of cellular functions82:-
1. Transport of substances through multiple membranes in the cell,
2. Synthesis of chemical compounds throughout the cell, and
3. Mechanical work: The final major use of ATP is to supply energy for special cells to perform mechanical work.

DISCUSSION

All the above mentioned characteristics of Bala match well with the definition of Health by World Health Organization (WHO) asserting it to be ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’83 which closely resembles the definition laid down in Ayurvedic texts, more than 3000 years ago84.

There is clear explanation of guna of Brimhana dravya in classical text but guna of Balya dravya is not given separately. Guna of Balya dravya as per analysis of Rasapanchaka of 10 dravya given as balya mahakashaya by Caraka can be illustrated
as follows: Madhura rasa 60%, Snigdha guna 70%, Sheet veerya 80%, Madhura vipaka 90%.

**CONCLUSION**

While many of the factors affecting Bala are beyond the scope of the physicians, but it is possible to manipulate the others. Yuktivypashraya chikitsa may be utilized to enhance Sahaja bala through lifestyle management during pregnancy for enhancing the bala of the next generation, and yuktikrit bala through administration of Balya dravya (Ahara as well as Aushhadha), Balya karma (Exercise, Yoga, etc) and psychic counselling (to promote satva bala).

The concept of Balya karma and the pharmacodynamical properties of Balya dravya may be utilized to enhance the Bala in general or of some particular system/organ as per the need of the situation which may help to build strong man power and a strong nation.

**REFERENCES**


5. E-samhita, Cakrapani, Dalhana on Sushrut Sutrasthana 15/19, Central Council for Research in Ayurvedic Sciences (CCRAS), New Delhi, available on http://niimh.nic.in/ebooks/esushruta/?mod=read, 10 June 2017.


21. E-samhita, Sushrutadharana on Caraka Sutrasthana. 11/16, Central Council for Research in Ayurvedic Sciences (CCRAS), New Delhi, available on http://niimh.nic.in/ebooks/ecaraka/ mod=read, 10 June 2017


44. Ibidem (2). Caraka Samhita. Vimanaadhya. Rogahishagityeeyavimana Adhyaya. 8/120, P 280


57. Ibidem (6). Shrushita Samhita. Sutrasthana. Doshadhatumalakshayavriddhivigyaneeya Adhyaya. 15/7, P 68

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