

# PREVENTION IS WISER THAN CURE

Ever since the advent of human race on this planet, human beings have been striving hard to maintain a good healthy life. It has been a continued struggle since then through Ayurved, Unani and all other systems of medicine and scientists have devised various methods and theories to achieve this objective. The sage physicians of Ayurved have given some wonderful principles which were true then, today and will always remain true. Prevention implies to stop doing something and cure means to find a solution. Prevention is the shield which saves mankind from many disasters, chaos and destruction. Cure involves much more effort and pain than what would be needed to prevent a problem from affecting us a cure is a blessing but prevention is much more than a blessing. A wise act of a cautious mind can check us from stepping into something wrong or dangerous. The act of right living makes everything possible. Living in the right sense means living judiciously wisely and cautiously. Prevention halts or obstructs the danger or evil etc. from the person before it overpowers him. It enables him to escape from it completely. Cure is solution for the danger or evil which has already engulfed him hence prevention is wiser than cure. An unfortunate act can be avoided if planning is done well in advance, If we want to avoid disease, we have to plan in advance.

Each year millions of people die due to preventable diseases. At least half of the deaths occur due to preventable behaviors and exposures. Leading causes of death worldwide include cardiovascular, chronic respiratory diseases etc. Many die due to poor diet and sedentary lifestyle. According to WHO, in 2011 about 55 million people died worldwide, and two thirds of them died due to non communicable diseases including cancer, diabetes and chronic respiratory and cardiovascular diseases. This was an increase from 2000 when 60% died due to these causes. Preventive healthcare is especially important as there is increase in prevalence of chronic diseases and deaths from these diseases.

There are many methods for prevention of diseases. It is recommended that everyone should visit their doctor for regular checkup even if they feel healthy, to perform disease screening, to adopt healthy and balanced lifestyle and stay up to date with immunization boosters. Some common disease screening include checking for Hypertension, Hyperglycemia, hypercholesterolemia, STD's, for gastric disorders or predisposition to certain diseases. Preventive health care strategies can be described as taking place at the primary, Secondary and tertiary levels.

**a) Primary prevention:** Methods to avoid occurrence of disease either through eliminating disease causing



agent or increasing resistance to disease. Examples include immunization against disease maintaining a healthy diet and exercise regime and avoiding smoking.

- b) Secondary Prevention:** Methods to detect and address an existing disease on appearance of symptoms e.g hypotension, cancer screening etc.
- c) Tertiary prevention :-** Methods to reduce negative impact of symptomatic disease such as disability or death through rehabilitation and treatment.

## Magnitude of problem of chronic diseases

A major chunk of health budget of any country is spent on people with chronic conditions. These persistent conditions are leading cause of death and disability, compromised quality of life and burgeoning health care costs which can be prevented or lessened.

In addition to physical ailments these chronic conditions can exacerbate the symptoms of depression and depressive disorders can themselves lead to chronic diseases . The cost of treatment of all diseases is escalating day by day and treatment of diseases is becoming unaffordable even for well to do families so the only logical solution is prevention.

## Main Problems

The main problems that produce significant impairment in the health of human beings are heart diseases, stroke, respiratory diseases, cancer, obesity, hypertension, arthritis, diabetes mellitus, liver and kidney disorders, oral conditions and chronic abdominal diseases etc. All these problems can be controlled to a large extent by following a healthy life style and taking care of one's health from early stage of life.

Cancer continues to claim millions of lives every year and is a leading cause of death throughout the world. The most commonly diagnosed cancers are of lungs and bronchus, female breast and cervical cancers, blood cancer, colorectal cancer and prostate cancer. Lung cancer remains the leading cause of cancer deaths both in men and women. More than 80% of lung cancers are due to smoking or exposure to second hand smoke.

Diabetes mellitus is becoming more common every day, It has become one of the most significant cause of death and disability pertaining to cardiac conditions, kidney

failure, eye problems, neurological problems and foot & leg amputations.

Arthritis has also become a major cause of disability affecting around 20% of middle age population. Considerable progress has been made in raising awareness and understanding of effective, evidence based massage treatment and intervention (such as mechanical aids) to decrease disability and improve quality of life among patients of arthritis.

Obesity has emerged as a priority in chronic disease prevention and has been linked to increased risk for heart disease, type 2 diabetes, arthritic disability and some cancers. Obesity is on the increase in India particularly due to bad life style and faulty eating habits. The prevalence of obesity is higher among adolescents and young adults and a lot of efforts are required to control obesity related diseases.

Ayurveda, the science of life has always stressed upon the importance and significance of prevention over cure. The very aim of Ayurveda "Swasthasya Swasthya Rakshnam, Aturasya, Vikar Parshamnam" gives priority to prevention over cure of diseases. '

The great sage physicians of Ayurved have given us some wonderful principles for prevention of diseases. The concepts and advices given in the form of dincharya and ritucharya help us in not only preventing diseases but also provide us great natural strength, vigour and vitality to lead a long and healthy life without any disease. In the fifth chapter of Charak sutra sthan, Acharya Charak has very vividly described type of diet that should be taken to avoid diseases and to promote health for different prakriti types. Acharya has advised to take only  $\frac{1}{2}$  to  $\frac{2}{3}$  part of one's appetite.

The steps enunciated in daily routine are very important for prevention of various diseases. The use of anjan is described to prevent diseases of eyes and that of dhumpan (medicated smoke) to ward off diseases of oral cavity, ear, nose and throat and avoid khalitya and palitya which are common in today's world. Similarly, nasya is described to avoid diseases like headache, facial paralysis, lockjaw, rhinitis & hemicranias etc. In addition to above, acharya has described daily routine in the form of teeth and tongue cleaning, gandush dharan, oil massage on head, body massage with oil and sponging of body to prevent diseases of different parts of body.

Acharya Charak has also described seasonal regimens if one follows these seasonal regimens then one can prevent all diseases pertaining to different parts of body. In addition to the above, ayurvedic acharyas have also given instructions about the timing and types of food to be taken for different types of prakriti to ward off diseases. In order to prevent psychiatric diseases (mansik, rog), acharyas have advised to follow the rules of right conduct i.e (to refrain from greed, sorrow, fear, ego, shamelessness, jealousy, excessive indulgence in love, greed of wealth, and to speak in soft and pleasant

tone. We should also avoid unpleasant and untimely talking. If one follow these directives then one can prevent most of the mental disorders.

Acharya sushrut as divided the stages of illness into six stages viz. sanchayavastha, prakopavastha, prasaravastha, sthansanshara, yavaStha, vyaktavastha and bhedavastha. He has advised to stop the progression of disease in the first stage (anchyavastha) itself "sanchya aphaarita dosha labhante na uttra gati te tuttrashu gati bhavanti balwattra" which is a very practical advice.

Ayurvedic physicians have also written a separate chapter namely rasayan vigyan in which they have described various medicines, rasayan therapy maintains the body matrix, promotes memory, intelligence, immunity against diseases preservice of youthfulness & luster, a fair complexion and maintain optimum strength of body and senses, prevent wear and tear of body tissues and promote total health content of an individual.

Concept of prakriti offers an individualized approach for prevention and management of diseases. It is an essential part of Ayurved which helps to plan and live a healthy life as per one's prakriti type.

Modern medicine has also made tremendous progress in the field of preventive medicine, vaccination is a very important aspect of prevention of many dangerous diseases like polio, diphtheria, pertussis hemophilus influenza, typhoid, chicken Pox, mumps and measles etc. It has been a great achievement on the part of modern medicine that they have been able to eradicate diseases like small pox and polio- myelitis from almost all parts of the world. In addition to this secondary and tertiary methods of prevention of diseases in modern medicine are also effective.

### Conclusion

In order to formulate a comprehensive strategy we need to amalgamate the strengths of modern and ayurvedic system of medicines. Primary prevention in infants and young children should be done with the help of vaccination which is very effective for the prevention of many diseases of childhood as also prevention of various diseases of adults in weak and immune compromised patients. After that, young children should be encouraged to adopt a healthy life style as per ayurvedic principles, they should be taught to adopt the principles of dincharya and ritucharya, so that they develop innate physical and mental strength. These habits should be continued in adulthood and all phases of life. Rasayan drugs should be used by all as per their prakriti type. Everybody should follow a healthy life style, perform regular exercise and eat right type of food in right quantity so that one can live a healthy life free of any disease and infirmity.

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# ROLE OF GUDUCHI SWARAS IN THROMBOCYTOPENIA

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**Abstract :** *Ayurveda* is a natural health care system that originated in India more than 5000 years ago. Its main objective is to achieve optimal health and well-being through a comprehensive approach that addresses mind, body, behavior, and environment. *Ayurveda* classifies the diseases on the basis of *Dosha-dushya sidhanta*. *Charka* says that it is not possible to name and describe all the diseases. The physician can diagnose any clinical condition on the basis of the *dosha-dushya* and treat accordingly. An exact equivalent disease to Thrombocytopenia is not found in *Ayurveda* but symptomatology of Thrombocytopenia can be correlated with the symptoms of already mentioned diseases like *Raktapitta*, *Visarpa* and *Jwara*. Thrombocytopenia is the pathological condition which occurs as a symptom in many diseases e.g. dengue hemorrhagic fever (DHF), Idiopathic Thrombocytopenic Purpura etc. In modern medical science, the treatment of Thrombocytopenia is transfusion of platelet rich plasma that is very costly, needs specialized skills and machinery, can be stored for only a few hours and it is also risky in the sense that it can cause blood borne diseases through infected plasma transfusion. Therefore alternative therapy is required and *Ayurveda* provides cost effective, safe and potent management. In *Ayurveda*, many medicinal plants are easily available which have important role in the management of Thrombocytopenia. Eg. *Guduchi*.

**Key words-** *Guduchi swarasa*, Thrombocytopenia, Alternative therapy, dosha dushya.

## Introduction:

Thrombocytopenia is the pathological condition which occurs as a symptom in many diseases. Immune-mediated destruction of platelets is thought to be the mechanism of Thrombocytopenia seen after the viraemic phase of dengue hemorrhagic fever (DHF) <sup>[1]</sup>. Dengue viral infection in human being presents mostly as Dengue fever (DF) or dengue hemorrhagic fever (DHF). Dengue virus induces a wide spectrum of clinical presentations including hemorrhagic manifestations associated with thrombocytopenia and increased vascular permeability.<sup>[2]</sup> In modern medical science, the treatment of Thrombocytopenia is transfusion of platelet rich plasma that is very costly, needs specialized skills and machinery, can be stored for only a few hours and it is also risky in the sense that it can cause blood borne diseases through infected plasma transfusion. Therefore alternative therapy is required and *Ayurveda* provides cost effective, safe and potent management. In *Ayurveda*, many medicinal plants are easily available which have important role in the management of Thrombocytopenia eg. *Guduchi*.

## Thrombocyte

**Platelets** or **thrombocytes** are important blood cells in our body. Platelets originate from cells known as megakaryocytes, which are found in the bone marrow. Thrombocytes are important for normal blood clotting. They are small, disk shaped and anuclear cell which have diameter 23  $\mu\text{m}$ .<sup>[3]</sup> The average lifespan of a

platelet is normally just 5 to 9 days. Platelets are a natural source of growth factors. A normal human platelet count ranges from 150,000 to 450,000 platelets per microlitre of blood.<sup>[4]</sup>

## Thrombocytopenia

**Definition:** Thrombocytopenia (Thrombocythemia) is a blood disorder characterized by an abnormally low number of circulating platelets (thrombocytes) in the bloodstream. Thrombocytopenia is when platelets count falls below 50,000 per microlitre.<sup>[5]</sup> Thrombocytopenia is a common problem in dengue fever. The pathogenesis of Thrombocytopenia in dengue fever is not clearly understood. Increased peripheral destruction of antibody coated platelets is strongly suspected as the possible mechanism. Other factors include acute bone marrow bone suppression leading to amegakaryocytic condition and enhanced platelet destruction by the reticuloendothelial system.<sup>[6]</sup>

## Causes:<sup>[7]</sup>

Thrombocytopenia is often divided into four major causes of low platelets:

1. Low production of platelets in the bone marrow.
2. Increased breakdown of platelets in the blood-stream (called intravascular).
3. Increased breakdown of platelets in the spleen or liver (called extra vascular).
4. Other causes.

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- Dengue fever is an important cause of thrombocytopenia. In dengue fever there is decrease in production of platelets as well as increase in destruction of platelets because dengue virus can cause direct infection of bone marrow megakaryocytes which leads to decrease in platelets formation as well as immunological shortened platelets survival. Other than dengue, reduction in count of platelets by systemic viral and bacterial infection may occur.
- Other causes responsible for low count in platelets are vitamin B<sub>12</sub> or folic acid deficiency, leukemia, improper function of liver, HIV associated thrombocytopenia and snake bite.
- Thrombocytopenia may occur due to the harmful effects of some medicines such as Valproic acid, heparin, anti-seizure drugs, sulfa drugs, certain cardiac drugs, non-steroidal anti-inflammatory drugs, GI drugs, and many other chemotherapy drugs and Proton pump inhibitors.

### Sign and Symptoms <sup>[8]</sup>

Often, low platelet levels do not lead to clinical problems; rather, they are picked up on a routine complete blood count.

- The main symptom of Thrombocytopenia is bleeding, either on the surface of the skin or inside the body.
- Occasionally, there may be bruising, particularly purpura in the forearms, petechiae (pinpoint hemorrhages on skin and mucous membranes), nosebleeds, and bleeding gums.
- Eliciting a full medical history is vital to ensure that low platelet count is not due to a secondary process. It is also important to ensure that other blood cell types, such as red blood cells and white blood cells, are also not suppressed.
- A person with this disease may also complain of malaise, fatigue, and general weakness (with or without accompanying blood loss).
- Sometimes these patients have heavy, slow or continuous bleeding due to minor injuries or trauma. In these patient there is external bleeding as well as internal bleeding present which results in anemia and shock.

### Ayurvedic perspective

*Ayurveda* classifies the diseases on the basis of *Dosha-dushya siddhanta*. *Charaka* says that it is not possible to name and describe all the diseases. The physician can diagnose any clinical condition on the basis of the dosha-dushya and treat accordingly.<sup>[9]</sup> An exact equivalent of thrombocytopenia is not found in *Ayurveda* but symptomology of thrombocytopenia can be correlated with the symptoms of already mentioned diseases like *Raktapitta*, *Visarpa* and *Jwara*. In *Ayurveda*, symptoms of Thrombocytopenia correlate

with these diseases such as bleeding symptoms seen in *Raktapitta*, indication of rashes on skin (*Raktamandal*) in *Visarpa* and symptoms like malaise, fatigue, general weakness and temperature included in *Jwara*. In *Ayurveda*, disease like Thrombocytopenia can be managed by following the treatment principles of these diseases.

### Ayurvedic management of Thrombocytopenia

Ayurvedic treatment for thrombocytopenia is similar to the treatment of bleeding disorder (*Raktasravajanya vyadhi*). Bleeding disorders usually follows Thrombocytopenia.

In *Ayurveda*, platelets can be taken as a part of *Raktadhatu*. So the decreased platelet count can be included in the blood is called Thrombocytopenia (*Raktadhatukshaya*). The Ayurvedic classics have described the various etiological factors for the *Raktadhatukshaya*. Due to excessive usage of *Katu*, *Amla*, *Lavan*, *Tikshana ahara* etc., the *Doshas* get accumulated in their own places, leading to accumulation of *Pitta Dosha*, and *Rakta* has similar properties to *Pitta dosha*. That is why increasing the *Pitta dosha* as well as *drava guna* of *dhatu*, *Rakta* is also increased. So that vitiated *Rakta* secreting out from the *Raktavaha srotasha* and leads to decrease state of *Raktadhatu*. Therefore, any drugs that will be working against *Raktadhatukshaya* or *Pitta dosha* might act as platelets increasing agents.

According to *Ayurveda*, the drug or diet, that is opposite to the *Doshas* will subside their functions, and the similar drug or diet will enhance the *Dosha*. The *Sandhaniya Karma* is also known as *Santarpana Karma* it is opposite to the *Apatarpana karma* as the body tissues are produce in *sandhan* too because *Sandhaniya dravyas* are union promoters. The *Sandhaniya Dravyas*, after administration, due to their *Guru*, *Shita* and *Manda Guna* stimulate the production of tissues and help to prevent bleeding. Likewise the *Madhur*, *Tikta* and *Kashaya Rasas* and *Madhur*, *Vipaka* of the drugs, due to their *Parthiva* and *Jaliya* nature, stimulate the aggregation of the tissues.

In Ayurvedic classics, we have a description of group of drugs such as *Sandhankar*, *Raktavidhikar* (the one which increases the *Raktadhatu*), *Pittaghana* (the one which acts against *Pitta dosha*) which might demonstrate the antithrombocytopenic activity. Out of these drugs we are describing here the *Sandhankar* effect of *Guduchi*.

### *Guduchi* <sup>[10]</sup>

**Botanical Name-** *Tinospora cordifolia*. Miers ex Hook.f. & Jhoms

**Family-** Menispermaceae

**Rasa-** *Tikta, Kashaya*

**Veerya-** *Ushna*

**Guna-** *Guru, Snigdha*

**Vipaka-** *Madhur*

**Doshagnata-** Tridoshashamka

**Rogagnata-** Raktavikara, Visarpa, Twagroga, Jwara, Vishamajwara, Jeernajwara, Kushtha

**Karma-** Raktashodhaka, Raktavardhaka, Hridya, Jwaraghna, Sandhaniya

Since centuries, the use of *Guduchi* has been successful in treatment of Thrombocytopenia which is caused by Dengue fever. That's why for this disease the use of *Guduchi* is being centre of attraction in practice and human being. Because in modern medical science we have no other effective treatment rather than platelets transfusion.

The use of *Guduchi* in diseases like Thrombocytopenia has been clarified by collection of classical references and their description. The function of *Guduchi* related to above disease is clarified by following references.

### 1. Sandhaniya mahakashaya<sup>[11]</sup>

“madhukamadhuparniprisniparniyambasheakisaman gamocarasadhatakilodhrapriyangukatphalaniti dasemani sandhaniyani bhavanti” ( Ch.Su.4/9)

Here the description of *Guduchi* is present by the name of *Madhuparni*. *Sandhaniya dravyas* are union promoters. These *dravyas* have properties of healing broken *Rakta*, *Mansa* and *Asthi Dhatu avayava*. *Sandhaniya* means to join. For this perspective the *Sandhaniya karma* of *Guduchi* is effective in Thrombocytopenia.

In *sutra sthana* of *Charaka samhita*, *Acharya Charaka* has mentioned “*Madhu sandhadhatii*”, from this *Sandhaniya karma* of *Madhu* has clarified.<sup>[12]</sup>

Traditionally when we use *Guduchi swarasa* with the *anupan* of *Madhu* then according to the principle of “*Samanya Vridhikaranam*” having more effectiveness.

### 2. Valli panchamoola<sup>[13]</sup> (Shu.Su.38/73-75)

*Guduchi* is one of the constituent of *Valli panchmoola* whose pharmacological action is describe as:

“raktapittaharau hyeto sophatraya vinasanau sarvamehaharau caiva sukradosha vinasanau”

(Shu.Su.38/73-75)

*Raktapitta shamana* is the first and important action of *Valli panchamoola*.

Rather than above those two references, the use of *Guduchi* is abundantly found in Ayurvedic classics like in *Jwara*, *Raktapita* and *Visarpa* which is important for the perspective of Thrombocytopenia.

3. The appearance of red petechie on the skin due to low count of platelets in Thrombocytopenia and for the treatment of *Visarpa*, the use of *Guduchi* is described in many classics.<sup>[14]</sup>

“draksam parpatakam shunthi guduchim dhanvayasakam nishaparyushitam dadyattrishnavisarpsantaye

(Ch.Ci 21/58)

4. In *Chikitsa sthana* of *Charaka samhita*, *Acharya Charaka* describe the decoction of *Guduchi* and *Devdaru* in *Granthi visarpa*.<sup>[15]</sup>

5. In *Chakradatta*, the use of *Guduchi* in *Visarpa Cikitsa* mentioned as:

- visarpa rogadayamratadi qvatham<sup>[16]</sup>
- vishajanit visarpe navakabhaya guggulu<sup>[17]</sup>
- visarpa roge kundalyadi kvatha<sup>[18]</sup>

### Conclusion:-

In light of the above classical references and personal practice experience, the antithrombocytopenic action of *Guduchi* is clear. *Guduchi* is an important drug which is described in *Sandhaniya*, *Raktapittahar*, treatment of *Visarpa* and *Jwara* which is important for the perspective of Thrombocytopenia. With the *anupan* of *Madhu*, *Guduchi* become more effective that is seen through experience and classically. A systematic and thorough research to establish *Guduchi* as an effective treatment module in Thrombocytopenia is highly required.

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# EVALUATION OF EFFECT OF ARJAKADI VATI WITH SPECIAL REFERENCE TO MALE SEXUAL DYSFUNCTION A SCIENTIFIC STUDY

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**Abstract :-**

The clinical study to evaluate the effect of Arjakadi vati with special reference to male sexual Dysfunction. 60 patients were selected from O.P.D. of V.Y.D.S.AY.P.G.College Khurza, Bulandshahar (U.P.) and were divided into two groups. The results were assessed statistically. The observed result suggest that Arjakadi Vati can be effectively used for male sexual dysfunction.

**Keywords:- Arjakadi Vati, Male Sexual Dysfunction, Clinical Study**

**1. Introduction:-**

Arjakadi vati is an important formulation mentioned in Bhaishajya Ratnawali in veerya stambhan prakaran. The composition of Arjakadi vati is Arjaka, Shankhapushpi, Renuka, Bhringraja, Jatiphal, Lavanga, Vidanga, Gajapippali, Tvak, Ela - sukshma, Tejapatra, Nagkesara, Vansalochana, Anantamoola, Shwetamusali, Satavari, Vidarikanda, Gokshura, Atmagupta & Babbola bark. The present study was done to evaluate the effect of Arjakadi vati with special refrence to male sexual dysfunction property.

**2. Aims & Objectives:-**

To evaluate the effect of Arjakadi Vati w.s.r. to male sexual dysfunction.

**3. Materials & Methods :-**

60 married male individuals between the age group of 18-50 years were registered for the present clinical trial from O.P.D. of V.Y.D.S. Ay. P.G. College Khurza, Bulandshahar (U.P.).

- 60 patients were divided in to two group, Group A & B , Group A 30 patients were administered Arjakadi Vati 1 gm. B.D. with plain water and Group B given Placebo vati 1 gm B.D. with plane water.

**3.1. Inclusion Criteria:-**

- Male married individual between the age group 18-50 years.
- Male who were unable to make satisfactory sexual relationship, due to erectile dysfunction.
- Patients having Oligospermia.

**3.2. Exclusion Criteria:-**

- Unmarried male below 18 years & above 50 years age.
- Patients having any psychological disorder.
- Smoker, drug addicts & alcoholic individual.
- Male with primary & secondary azoospermia.

- Drug induced erectile dysfunction eg. chemotherapy.
- Having only sexually transmitted disease.

**3.3. Administration of Drug-**

Prior to administration of Arjakadi Vati all the healthy male individuals were administered “Haritkyadi churna” consisting of Haritaki, Saindhav Lavan, Amalaki, Guda, vacha, Vidanga, Haridra, pippali & Sunthi ,described in Charak Samhita Chikitsa Sthana 11/21-24 in the dose of 3-5 gm B.D. with warm water for 3-5 days according to condition of their Kosta for Kosta Suddhi.

**3.4. Study Design**

- Type of study- Randomized single Blind Placebo controlled.
- Number of patients -60
- All the registered Patients for clinical trial were divided into groups consisting of 30 Patient each.
- Group A- Arjakadi Vati 1 g B.D. with plane water.
- Group B- Placebo Vati 1 g B.D. with plane water.
- Duration of Clinical trial was 90 days with follow up after 45 days. All the healthy male individuals were recommended dietary restriction as per the description available in the Ayurvedic classics during the therapy.

**3.5. Criteria for assessment of the Result :-**

Assessment was made depending on the change in subjective & objective parameters. Subjective parameters include feeling energetic, feeling of wellbeing, improvement of sexual act etc. and objective parameters include semen analysis. Clinical assessment was made as per the symptom rating scale as follows.

Sexual Desire	Score
➤No desire at all	0
➤Lack of desire	1
➤Desire present but no activity	2
➤Desire present only on demand of partner	3
➤Normal desire	4
➤Excessive desire	5

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<b>Erection of Penis</b>	<b>Score</b>	<b>Post-act exhaustion</b>	<b>Score</b>
➤ No erection at all by any method	<b>0</b>	➤ No exhaustion at all	<b>0</b>
➤ Erection with artificial method	<b>1</b>	➤ Slight exhaustion occasionally	<b>1</b>
➤ Erection but unable to penetrate	<b>2</b>	➤ Exhaustion in 25% of the encounters	<b>2</b>
➤ Initial difficulty but also able to penetrate	<b>3</b>	➤ Exhaustion in 50% of the encounters	<b>3</b>
➤ Erection but occasional failure	<b>4</b>	➤ Exhaustion in 75% of the encounters	<b>4</b>
➤ Erection whenever needed	<b>5</b>	➤ Exhaustion after sexual act	<b>5</b>

<b>Erection of Penis</b>	<b>Score</b>	<b>Performance Anxiety</b>	<b>Score</b>
➤ Total loss of stiffness and unable to initiate the sexual intercourse	<b>0</b>	➤ No anxiety at all	<b>0</b>
➤ Loss of stiffness can initiate sexual act but unable to maintain erection till last	<b>1</b>	➤ Slight anxiety but does not hamper sexual act	<b>1</b>
➤ Some loss of stiffness able to maintain erection but unable to continue act till last	<b>2</b>	➤ Anxiety that hamper 25% of the encounters	<b>2</b>
➤ Some loss of stiffness, but can maintain the erection and continue the act till last	<b>3</b>	➤ Anxiety that hamper 50% of the encounters	<b>3</b>
➤ Proper stiffness to maintain erection and continue sexual act till last	<b>4</b>	➤ Anxiety that hamper 75% of the encounters	<b>4</b>
		➤ Anxiety that hamper in almost all the encounters	<b>5</b>

<b>Orgasm</b>	<b>Score</b>	<b>Sperm Count</b>	<b>Score</b>
➤ No Enjoyment at all	<b>0</b>	➤ Sperm count below normal and sperm abnormal	<b>0</b>
➤ Lack of enjoyment most of the occasions	<b>1</b>	➤ Sperm count below normal and sperm normal	<b>1</b>
➤ Enjoyment in 25% of the encounter by ejaculating inside the vagina	<b>2</b>	➤ Sperm count normal but sperm abnormal	<b>2</b>
➤ Enjoyment in 50% of the encounters by ejaculating inside the vagina	<b>3</b>	➤ Sperm count and quality normal	<b>3</b>
➤ Enjoyment in 75% of the encounters by ejaculating inside the vagina	<b>4</b>	➤ Sperm count and quality above normal	<b>4</b>
➤ Enjoyment in every sexual intercourse by ejaculating inside the vagina	<b>5</b>	➤ Sperm count and quality very good	<b>5</b>

#### 4. Semen Analysis

Semen analysis of all the registered patients was done before & after the treatment. In analysis the following things were noted.

- Volume in ml.
- Liquification time.
- Viscosity.
- PH.
- Total sperm count in million per milliliter.
- Motility in percent.
- Motile sperm.
- Non motile sperm.
- Sluggish sperm.

<b>Ejaculation</b>	<b>Score</b>
➤ No ejaculation at all	<b>0</b>
➤ Delayed ejaculation without orgasm	<b>1</b>
➤ Ejaculation before penetration	<b>2</b>
➤ Ejaculation with penetration but early discharge	<b>3</b>
➤ Discharge ejaculation with own satisfaction	<b>4</b>
➤ Ejaculation with own and partner's satisfaction	<b>5</b>

#### 5. Haemoglobin Assessment

Hb gm % of all the subject registered was assessed before & after treatment, to evaluate the change occurred.

#### 6. Observations & Results

**Table No. 1:- Showing Pattern of Objective parameter in Male Sexual Dysfunction in Group- A**

Objective parameter	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
<b>Body Weight</b>	58.17	59.70	30	1.53	2.64	0.51	0.09	16.55	<0.001	H.S.
<b>Pulse Rate</b>	73.73	75.40	30	1.67	2.26	4.00	0.73	2.28	<0.025	S.
<b>Respiratory Rate</b>	17.00	16.53	30	0.47	2.75	1.94	0.35	1.32	>0.1	N.S.
<b>B.P. (Systolic)</b>	127.03	124.20	30	2.83	2.23	6.58	1.20	2.36	<0.025	S.
<b>B.P. (Diastolic)</b>	84.27	82.60	30	1.67	1.98	3.86	0.71	2.36	<0.025	S.

**Table No. 2:- Showing Pattern of Objective parameter in Male Sexual Dysfunction in Group- B**

Objective parameter	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Body Weight	58.57	59.43	30	0.87	1.48	1.96	0.36	2.42	<0.025	S.
Pulse Rate	17.47	16.93	30	0.53	3.05	1.74	0.32	1.68	<0.1	N.S.
Respiratory Rate	77.13	75.93	30	1.20	1.56	5.52	1.11	1.19	>0.1	N.S.
B.P. (Systolic)	128.20	126.73	30	1.47	1.14	6.08	1.11	1.32	<0.1	N.S.
B.P. (Diastolic)	87.47	86.53	30	0.93	1.07	4.42	0.81	1.16	<0.1	N.S.

**Table No. 3:- Showing Effect of Therapy on Hematological Changes in Group- A**

Haemoglobin Changes	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Hb gm%	12.87	13.60	30	0.73	5.67%	0.44	0.08	9.11	<0.001	H.S.

**Table No. 4:- Showing Effect of Therapy on Hematological Changes in Group- B**

Haemoglobin Changes	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Hb gm%	13.12	13.40	30	0.28	2.13%	0.60	0.11	2.56	<0.010	S.

**Table No. 5:- Showing Effect of Physiological Changes in Male Sexual Dysfunction in Group - A**

Psychological Changes	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Feeling of Well Being	0.00	0.77	30	0.77	89.66	0.63	0.11	6.71	<0.001	H.S.
Energetic Feeling	0.00	0.77	30	0.77	96.00	0.50	0.09	8.33	<0.001	H.S.
Improvement of Act	0.00	0.67	30	0.67	88.46	0.66	0.12	5.53	<0.001	H.S.

**Table No. 6:- Showing Effect of Physiological Changes in Male Sexual Dysfunction in Group B**

Psychological Changes	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Feeling of Well Being	0.00	0.23	30	0.23	66.67	0.82	0.15	1.56	<0.1	N.S.
Energetic Feeling	0.00	0.17	30	0.17	66.67	0.70	0.13	1.31	>0.1	N.S.
Improvement of Act	0.00	0.10	30	0.10	60.00	0.71	0.13	0.77	>0.01	N.S.

**Table No. 7:-Showing Effect of Therapy on Sexual Parameter in Male Sexual Dysfunction in Group-A**

Sexual Parameter	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Sexual Desire	2.33	3.67	30	1.33	57.14	0.80	0.15	9.10	<0.001	H.S.
Erection of Penis	2.07	3.50	30	1.43	69.35	1.43	0.26	5.49	<0.001	H.S.
Penile Rigidity	1.93	3.30	30	1.37	70.69	0.49	0.09	15.27	<0.001	H.S.
Orgasm	2.30	4.13	30	1.83	79.71	0.91	0.17	11.00	<0.001	H.S.
Ejaculation	2.83	4.07	30	1.23	43.53	0.73	0.13	9.28	<0.001	H.S.
Post Exhaustion	2.53	4.20	30	1.67	65.79	0.76	0.14	12.04	<0.001	H.S.
Performance Anxiety	2.30	2.97	30	0.67	28.99	1.03	0.19	3.55	<0.001	H.S.

**Table No. 8:-Showing Effect of Therapy on Sexual Parameter in Male Sexual Dysfunction in Group- B**

Sexual Parameter	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Sexual Desire	0.97	1.67	30	0.70	72.41	1.06	0.19	3.63	<0.001	S.
Erection of Penis	2.30	2.87	30	0.57	24.64	1.17	0.21	2.66	<0.025	S.
Penile Rigidity	2.63	2.97	30	0.33	12.66	1.24	0.23	1.47	>0.1	N.S.
Orgasm	3.00	3.47	30	0.47	15.56	1.07	0.20	2.38	<0.025	S.
Ejaculation	2.73	3.03	30	0.30	10.98	1.34	0.25	1.22	>0.1	N.S.
Post Exhaustion	2.50	2.80	30	0.30	12.00	1.44	0.26	1.14	>0.1	N.S.
Performance Anxiety	2.67	2.87	30	0.20	7.50	1.03	0.19	1.06	>0.1	N.S.

**Table No. 9:- Showing Effect of Therapy on Seminal Changes in Male Sexual Dysfunction in Group-A**

Seminal Analysis	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Volume	2.92	3.44	30	0.52	17.94	0.73	0.13	3.92	<0.001	H.S.
Liquification time	19.00	16.97	30	2.03	10.70	3.09	0.56	3.60	<0.001	H.S.
Sperm Count	80.73	85.60	30	4.87	6.03	7.00	1.28	3.81	<0.001	H.S.
Active Motile	74.17	77.97	30	3.80	5.12	5.45	1.00	3.82	<0.001	H.S.
Sluggish Motile	12.93	7.77	30	5.17	39.95	2.42	0.44	11.68	<0.001	H.S.
Non Motile	12.90	14.87	30	1.97	15.25	4.57	0.84	2.35	<0.025	S.

**Table No. 10:- Showing Effect of Therapy on Seminal Changes in Male Sexual Dysfunction in Group- B**

Seminal Analysis	Mean		No. of Pt.	Mean Diff	Relief %	S.D.	S.E.	t	p	Result
	B.T.	A.T								
Volume	2.92	3.44	30	0.52	17.94	0.73	0.13	3.92	<0.001	H.S.
Liquification time	19.00	16.97	30	2.03	10.70	3.09	0.56	3.60	<0.001	H.S.
Sperm Count	80.73	85.60	30	4.87	6.03	7.00	1.28	3.81	<0.001	H.S.
Active Motile	74.17	77.97	30	3.80	5.12	5.45	1.00	3.82	<0.001	H.S.
Sluggish Motile	12.93	7.77	30	5.17	39.95	2.42	0.44	11.68	<0.001	H.S.
Non Motile	12.90	14.87	30	1.97	15.25	4.57	0.84	2.35	<0.025	S.

## 7. Discussion

**Viscosity and pH-** Semen analysis was performed in the both groups for present trial but there was no abnormality found in Viscosity and PH in any sample of semen, before and after treatment. Hence no result are obtained regarding these parameter.

The patients were assessed on the following parameter.

### Subjective parameter-

These include sexual desire, Erection of penis, penile rigidity, orgasm, Ejaculation, Post Exhaustion, Performance Anxiety, feeling of wellbeing, Energetic feeling & improvement of sexual Act etc.

### Objective Parameter-

**Body Weight** - Both groups were compared in body weight. In group A 2.64% increase while group B is 1.48% increase in body weight after drug therapy (Table No.11) was observed

**Pulse Rate** - In group A 2.26 % increase while in group B 3.05% increase in pulse rate after drug trial. (Table No. 11)

**Respiratory Rate** - In group A 2.15% improvement while in group B 1.56% improvement in respiratory rate after drug therapy. (Table No.11 ) was observed.

**B.P. (Systolic)** - In group A 2.23% improvement while in group B 1.14% improvement in B.P. (Systolic) after drug therapy (Table No.11 ) was observed

**B.P. (Diastolic)** - In group A 1.98% improvement while in group B 1.07% improvement in B.P. (Systolic) after drug therapy (Table No. 11) was observed.

**Haemoglobin gm%** - In group A 5.67% increase & while group B is 2.13% increase in Hb gm% of drug trial (Table No.12) was observed.

### Psychological changes-

**Feeling of Well Being** Group A showed 89.66% increase & group B 66.67% increase in feeling of well being after drug trial. (Table No. 13)

**Energetic Feeling** - Group A 96.00% increase & while group B 66.67% increase energetic feeling after drug

trial (Table No. 13) was observed.

**Improvement of Acts** - In group A 88.46% increase & while group B 60.00% increase in Improvement of acts (Table No. 13) was observed.

**Sexual Parameter** (Table No. 14) Group A showed 57.14%. increase, and group B showed 72.41% increase in Sexual desire. In group A 69.35% increase & in group B 24.64% increase for erection of penis was observed. Group A showed 70.69% increase while group B showed 12.66% improvements in penile rigidity. In Group A 79.71% increase while Group B 15.56% increase in orgasm was observed. Comparison in both groups for ejaculation showed 43.53% increase in Group A while group B is 10.98% improvement. In group A 65.79% increase and group B is 12.00% improvement in post exhaustion was observed. In group A 28.99 % while group B 7.50% improvement in Performance of Anxiety was observed.

### Semen Analysis (Table No. 15)

**Seminal Volume** - Group A showed 17.94% increase & while group B 10.16% increase in volume of Semen after drug therapy.

**Liquefaction Time** - Group A showed 10.70% improvement & group B showed 9.58% improvement.

**Sperm count** Statistical analysis of drug showed in group A showed 6.03% improvement in group A & group B 4.76% improvement in sperm count after drug therapy.

**Active Motile** - Group A showed 5.12% increase after Arjakadi Vati therapy while group B 2.72% increase in motility of sperm after Placebo Vati.

**Sluggish Motile Sperms** Group A showed 39.95% increase after Arjakadi Vati while group B 7.40% increase after Placebo Vati therapy motility of Sluggish sperms.

**Non Motile Sperm** The data showed in Group A 15.25% increase after Arjakadi Vati therapy & group B 15.22% increase after Placebo Vati therapy in Non motile sperms.

**Table No.11-Showing comparison of % of change in group A and Group B in objective parameter**

Objective Parameter	% change	
	Group- A	Group - B
<b>Body Weight</b>	2.64%	1.48%
<b>Pulse Rate</b>	2.26%	3.05%
<b>Respiratory Rate</b>	2.75%	1.56%
<b>B.P. Systolic</b>	2.23%	1.14%
<b>B.P. Diastolic</b>	1.98%	1.07%

**Table No.12:-Showing comparison of % of changes in group- A and group B Haemoglobin gram percentage ( Hb gm %).**

Haemoglobin gram percentage	% change	
	Group- A	Group - B
Hb gm %	5.67%	2.13%

**Table No.13-Showing comparison of % of changes in group- A and group B in Physiological Parameter**

Psychological Parameter	% change	
	Group- A	Group - B
Feeling of well being	89.66%	66.67%
Energetic feeling	96.00%	66.67%
Improvement of act	88.46%	60.00%

**Table No.14-Showing comparison of % of changes in group- A and group B in Sexual Parameter**

Sexual Parameter	% change	
	Group- A	Group - B
Sexual Desire	57.14%	72.41%
Erection of Penis	69.35%	24.64%
Penile Rigidity	70.69%	12.66%
Orgasm	79.71%	15.56%
Ejaculation	43.53%	10.98%
Post exhaustion	65.79%	12.00%
Performance Anxiety	28.99%	7.50%

**Table No.15-Showing comparison of % of changes in group- A and group B in Seminal changes.**

Seminal changes	% change	
	Group- A	Group - B
Volume	17.94%	10.16%
Liquification Time	10.70%	9.58%
Sperm Count	6.03 %	4.76 %
Active Motile Sperm	5.12 %	2.72 %
Sluggish Motile Sperm	39.95 %	7.40 %
Non Motile Sperm	15.25 %	15.22 %

Table No.16- Showing effect of therapy on overall Physiological changes in group A and Group B.

Symptoms	Total relief in percentage	
	Group- A	Group - B
Physiological	91.37 %	64.44%

Table No. 17 -Showing total effect of therapy in Group A and Group B on overall Sexual Parameter.

Symptoms	Total relief in percentage	
	Group- A	Group - B
Over all Sexual Parameter	59.31%	22.24%

### Conclusion

Over all result on the basis of subjective parameter shows improvement of 91.37% in group A while group B 60.44% (table No. 16) whereas improvement in the sexual parameter in group A is 59.3%. while group B showed 22.24% improvement (table No.17). Arjakadi Vati can be used for male sexual dysfunction. The effects may be due to ingredients of Arjakadi Vati which are having balya, vrishya and shukra stambhan properties.

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# IMPROVEMENT OF LIFESTYLE IN ATHEROSCLEROTIC PATIENT THROUGH AYURVEDIC MANAGEMENT

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Ayurveda, one of the oldest surviving health care system that originated in India is a complete healthcare system with distinct theoretical underpinnings to rationalise therapeutics. Cardiovascular diseases are one of the leading causes of mortality in both developed and developing countries. The multifactorial nature of these diseases poses a huge challenge before the conventional bio- medicine in both prevention and cure of these diseases. There is a great interest in alternative health care system like ayurveda for improving cardiac health. Charaka describes that since Hridaya is the seat of ojus and is susceptible to pathologic changes due to mental stress, heart healthcare demands elimination of causes of mental stress. Thus, heart healthcare requires due consideration to the heart, channels (vessels) connected to it, ojus (immunity), mental health and stress. So while treating atherosclerosis, the status of Rasadhātu (plasma), Rasadhātawagni (metabolic principles of transformation of plasma), Medodhātawagni (metabolic principle of transformation of lipid) and srotodusti (vitiating of micro- channels) are to be considered. It is expected that those drugs which possess properties like Dipana (Digestive stimulant), Pachana (Digestive), Lekhana (Emaciating), Cardiogenic, srota prasadhaka (microcirculatory channel cleansers), pacifiers may help in breaking down the chain of reactions taking part in the development of atherosclerosis. Ayurvedic classics have mentioned therapeutic guidelines for maintaining optimum cardiovascular health. Thus, the ayurvedic herbs can be proved beneficial in maintaining the health of patients.

Finally, Ayurveda states that the knowledge and principle based rationale of the physician is the ultimate deciding factor in deciding which herbs to use.

**Keywords :** Atherosclerosis, srotodusti, ayurvedic herbal management.

## Introduction

Cardiovascular disease is one of the leading causes of mortality in both developed and developing countries. The multifactorial nature of this disease poses a huge challenge before the conventional bio- medicine in both prevention and cure of these diseases. There is a great interest in alternative health care system like Ayurveda for improving cardiac health. Ayurveda, one of the oldest surviving health care system that originated in India is a complete healthcare system with distinct theoretical underpinnings to rationalise therapeutics. Ayurveda envisages the functional balance between the various components of the living systems and harmonious existence with the nature as a pre-requisite for maintaining optimum health (1). Thus, the focus of Ayurveda has always remained on prevention and promotion of health alongside the curative aspects (2). The guiding principle regime for maintaining and promoting health is described by Charaka as to follow and practice that regime which maintains health on daily basis (3). This has to be done in two ways, a) health should be preserved by protecting health from impending stressors and b) by timely provision of adequate inputs. Cardiac health has been an important segment in Ayurveda considering the fact that hridaya (heart) is considered not only as blood circulating organ of the body but as the seat of consciousness.

One of the leading causes of most of the cardiovascular

diseases is atherosclerosis. Atherosclerosis is hardening and thickening of the arteries due to the formation of fat and fibrin deposits within the arterial tissue. It can be co-related with dhamani pratichaya mentioned by Charaka in kapha nanatamaja vyadhi (4). Here dhamani pratichaya is taken as dhamani upalepa (Chakrapani) where upalepa can be said as a sticky deposition or accumulation of fat or fibrin within the srotas which further leads to obstruction of the channels.

## Atherosclerosis Modern Prospective

Atherosclerosis is defined by WHO as variable combination of focal accumulation of lipids, complex carbohydrates, blood and its constituents, fibrous tissue and calcium deposits combined with changes in tunica media. Modern medicine classifies atherosclerosis as an inflammatory disease caused by injury to the endothelial cells that line the walls of arteries. Causes of injury to endothelial tissue include smoking, hypertension, hyperlipidemia, toxins, virus and immune reactions. Due to tissue damage a local immune response (inflammation) is initiated resulting in a number of factors leading to the oxidation of low-density lipoprotein (LDL). Oxidized LDL has been shown to be toxic to endothelial cells and it causes smooth muscle perforation and abnormal vasocstriction. Macrophages present at the site of injury due to local immune response engulf the oxidized LDL and then

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perforate into the intima of the vessel where they then form a lesion known as a fatty streak causing a thickened area of the blood vessel narrowing the circumference of the lumen. This process can gradually lead to a complete blockage of the artery causing the blood supply to be cut off completely to the area serviced by the diseased artery (8).

### Atherosclerosis Ayurvedic Perspective

Heart is the seat of different srotas, such as Pranawaha srotas, Rasawaha srotas, Raktawaha srotas. All the aforesaid causes of Heart disease are divided in Ayurveda in two groups or classes, snighdha guru and sheeta guna foodstuffs excessively consumed for a long time, gradually deposit sticky layer to the walls of arteries, nerves, veins internally. Thus the narrowing of lumen of srotas impedes the flow of Rasa, Rakta and Prana vayu in the body. The obstruction to this flow aggravate the Vyana vayu, the functional force behind circulation. The Vyana vayu indirectly aggravates the Prana vayu disturbing the natural process of breathing. The above pathological process of fat and fibrin accumulation also takes place at the level of heart valves which leads to stenosis further impeding the blood circulation in the body. Thus the heart forms the main transport channel.

### Ama and Hridaya Roga

*Usmanoalpabalatvena dhâtumâdyamapâcitam|  
Dushtamâmâmashyagatam rasamâmampracakshate||*  
(As.Hr 13/25)

The main causative factor in ama formation is 'mandagni'

*Rogâhsarveapi mandeagnau|*  
(As.Hr 11/1)

The main seat of Ama is amashaya but it can also take place at the level of dhatu due to manda dhatvagni affecting different srotas.

Ama due to its peculiar properties of Stambha, Gaurava, Avarodha leads to obstructed Hridaya disease. Ayurveda classifies atherosclerosis as Sanga (Deficient flow), also stagnation and accumulation which is disorder of kapha origin affecting Vyana vayu in Raktavaha srota. The causative factor being Kapha affects meda dhatu (adipose tissue), particularly the meda dhatu agni (metabolism at the level of adipose tissue). Decreased metabolic function at the level of adipose tissue increases the formation of adipose tissue resulting in excess meda dhatu either as subcutaneous

fat or fat that surrounds the organs. Increased meda dhatu formation begins to encroach on the upadhatu of rakta dhatu - blood, that being the arteries and blood vessels. As the meda dhatu accumulates in the raktavaha srota it begins to block the flow of Vyana vayu as it carries the blood from the heart to the peripheral tissues. Due to blockage of Vyana vayu blood pressure is increased to counter the kapha stagnation hence hypertension presents as a clinical sign.

### Ayurvedic approach to Cardiac Health

Charaka describes that since Hridaya is the seat of ojus and is susceptible to pathologic changes due to mental stress, heart healthcare demands elimination of causes of mental stress. Thus, heart healthcare requires due consideration to the heart, channels (vessels) connected to it, ojus (immunity), mental health and stress. Charaka has laid down the following therapeutic guidelines for heart healthcare (11).

- 1. Hridya (Cardio-tonics) Aushadha** Use of herbs and procedures that are beneficial to heart as an organ.
- 2. Srota Prasadana (Channel Modulators) Aushadha** Use of herbs and procedures that cleanse, maintain normal tone and helps in normal movement of the channels.
- 3. Ojasya (Beneficial to Ojus) Aushadha** - Use of herbs and procedures that are beneficial to ojus.
- 4. Mana Prashaman (Mind Pacifiers) Aushadha** - Use of herbs and procedures that relieves mental stress and improve mental strength.

While treating atherosclerosis the status of Rasadhatu (plasma), Rasadhatawagni (metabolic principles of transformation of plasma), Medodhatwagni (metabolic principle of transformation of lipids) and srotodusti (vitiation of micro-channels) are to be considered. It is expected that those drugs which possess properties like Dipana (Digestive stimulant), Pachana (Digestive), Lekhana (Curettage), Cardiotonic, srota prasadhaka (microcirculatory channel cleansers), pacifiers may help in breaking down the chain of reactions taking part in the development of atherosclerosis.

### A. Dipana (Digestive Stimulant)

Herbs that stimulate digestion are included in it. Charaka has mentioned Dipaniya Mahakashaya-Pippali, Pippalimula, Chavya, Chitraka, Shunthi, Amlavetas, Marich, Ajamoda, Bhallatakasthi, Hinguniryas. (12)

### *Shunthi*[6,7]

**Botanical Name-** Zingiber officinale Roscoe.

**Family-** Scitaminae (Zinziberaceae)

**Rasapanchak-**

Rasa- Katu Virya- Ushna  
 Vipaka- Madhura Guna- Guru, Ruksha, Tikshna  
 Karma- Vata-Kaphahara, Dipana, Bhedana.

**Part used-** Rhizome

**Doses** Fresh juice 5-10ml, Powder 1-2g

**Research Done-**

Protective effect of ginger, *Zingiber officinale*. Rose on experimental atherosclerosis in rabbits. (Verma Sk, et al Exp Bio. 2004 ).

There was distinct decrease in lipid peroxidation and enhancement of fibrinolytic activity in ginger treated animals. This distinct protection from the development of atherosclerosis by ginger is probably because of its free radical scavenging, prostaglandin inhibitory and fibrinolytic properties.

**B. Srota Prasadana (Channel cleansing & modulating herbs)**

Srota prasdana in its broad aspect has two meanings that a) which maintains proper lumen aperture b) which maintains elasticity of the channels.

***Pushkarmoola* [6,7]**

**Botanical name-** *Inula racemosa* Hook. f

**Family-** Asteraceae

**Ayurvedic Classification** Charaka has placed this in Swasahara (anti-asthmatic), Hikkanigrahan (anti-hiccups).

**Useful part-** Dried root.

**Rasapanchak-**

Rasa- Tikta, Katu Virya- Ushna  
 Vipaka- Katu Guna- Laghu, Tikshna  
 Karma- Vatakaphahara

**Uses-** It is used in hridaya shoala (angina pectoris), hrid roga (cardiac diseases) and medoroga (lipid disorders).

**Doses-** 1-3 grams twice daily with water after food.

**Recent Studies-**

1. *Inula racemosa* has been reported to reduce serum cholesterol. It showed reversal in the changed parameters of rats, where myocardial infarction was induced experimentally by *isprenaline* injection specially increased level of circulating GOT, LDH, CPK, *cortisol*, *pyruvate*, lactate glucose and cardiac *Camp adenyl cyclase*. The results were comparable to that of *ciplar*, a standard beta blocker.[13]

***Guggulu* [6,7]**

**Botanical name-** *Commiphora wightii* (Arn.) Bhandari

**Family-** Burseraceae

**Ayurvedic Classification** Sushruta has placed it in Eladi group. Vagbhatta says this as the best medicine for vata and meda disorders.

**Useful part-** Oleo gum- resin.

**Rasapanchaka -**

Rasa - Tikta, Katu Virya - Ushna  
 Vipaka - Katu  
 Guna - Laghu, Ruksha, Vishada, Sukshma, Sara, Snigdha, Picchila (new)

Karma - Tridosahara, Rasayana, Vrishya (new), Lekhana (old)

**Uses-** The older gum is widely used for reducing cholesterol due to its Lekhana property.

**Doses-** 1-2 grams twice daily for hyperlipidemia.

**Research done**

Anti atherosclerotic activity

1. Effect of gum-guggulu was observed on serum cholesterol, fibrinolytic activity and platelet adhesion in healthy individuals (group I) and in patients of CAD (group II) for a period of 30 days. Serum fibrinolytic activity improved by 22% and 19% at the end of 24 hrs where as after 30 days it was 40% and 30% in group I & II respectively. (Bordia & Chuttani, 1979)
2. Effect of guggulu on coagulation and fibrinolytic activity in experimental atherosclerosis is reviewed. (Kaur.et,al, 1980)
3. Administration of guggulu improved fibrinolytic activity in IHD. (Baldwa et al, 1980)

***Haridra* [6,7]**

**Botanical name** *Curcuma longa* Linn (C. Domestica Val)

**Family-** Scitminae (Zinzeberceae)

**Ayurvedic classification** Charaka has placed it in Lekhaniya, Kusthaghna, Kandughna, Krimighna, Shirovirechana.

**Useful part-** Rhizome

**Rasapanchaka -**

Rasa-Tikta, Katu Virya- Ushna  
 Vipaka- Katu Guna- Ruksha, Laghu  
 Karma- Kaphavatahara, Lekhana, Vishaghna, Varnya

**Research done**

Hypolipidaemic activity of *C.longa* extract was studied in hyperlipidaemic rabbits. The increased cholesterol level were brought down to normal by administration of *C.longa*. Similarly, phospholipids and triglyceride levels were also reduced.(Purohit & Daradka, 1999)

***Lasuna* [6,7]**

**Botanical name -** *Allium sativum* Linn.

**Family-** Liliaceae

**Useful part-** Bulb and Oil.

**Rasapanchaka -**

Rasa-Madhura, Lavana, Katu  
 Virya- Ushna, Tikta, Kashaya  
 Vipaka- Katu  
 Guna- Snigdha, Guru, Tikshna, Sara  
 Karma- Vatakaphahara, Balya, Brihana, Rasayana,

Vrishya, Netrya.

**Uses-** It is taken as Kanda kalka (paste of the bulb) in Hridayaroga and obesity.

**Doses-** Kanda kalka 3 to 6 grams, oil 1 to 2 drops.

**Recent Studies-**

1. *Garlic* supplementation at doses of at least 10 mg allicin or a total allicin potential of ~4000mcg. lowers total serum cholesterol between 10-12%. Specifically, *Garlic* both increases HDL and lowers LDL cholesterol, thus its effect on the LDL/HDL ratio is more significant than its effect on total cholesterol. It also has a moderate effect on elevated triglycerides. These actions have been demonstrated in several placebo controlled double blinded studies using various commercial preparations. [14]
2. Atherosclerosis and LDL oxidation: Doses of 600mg/day significantly decreased susceptibility of apolipoprotein B to oxidative damage in only two weeks in a double blind placebo controlled trial. A longer term study (10months) of hypercholesterolemic males also found decreased susceptibility of lipoproteins to oxidation compared to placebo. [15]

**Ojasya**

Herbs which increase ojus are also used for heart health. Rasayan (rejuvenating) herbs like Nagabala, Amalaki, Shilajit, etc. are useful for this.[16] The herbs belonging to Jivaniya Mahakashaya (rejuvenating group), Vayah Sthaapak (Anti-ageing group), etc. could be used for this purpose. [17]

**Mana Prashaman**

Mind tonics like Brahmi (*Bacopa monniera*) and Shankhapushpi (*Convulvulus pluricaulis*), stress relievers like Ashwagandha (*Withania somnifera*) are used to achieve a congenial mental health. Yoga, meditation and prayers should also be practised. Appropriate physical exercise regimen should also be followed.

**Conclusion**

Atherosclerosis is a serious problem affecting human population. The multi-factorial basis of this disease

poses a huge challenge in both prevention and cure and it is apparent that no single health care system can mitigate this problem entirely. An integrated approach is incumbent since alternate holistic systems like Ayurveda can address the multi-factorial aetiology in an effective manner. Ayurvedic classics have mentioned therapeutic guidelines for maintaining optimum cardiovascular health. Thus the above mentioned herbs can prove beneficial in restoration and maintenance of health of the Atherosclerotic patients.

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# CONCEPT OF IMMUNOMODULATION IN AYURVEDA

**Dr. Arghya Mukherjee**

**Abstract-** Immunomodulation is the modification of immune system for optimum immune responsiveness. Ayurvedic system of medicine is very much beneficial in different kind of immunology-related diseases (e.g rheumatoid arthritis, bronchial asthma, psoriasis, ulcerative colitis). It is an approach to search into the mechanism of action of Ayurvedic drugs used in immune-system related diseases.

**Key word-** Immunomodulation, Sansaman. Immunomodulator, Ayurvedic drugs.

## Introduction

The immune system is similar to the proverbial two edge sword. On one hand immunodeficiency states render human beings easy prey to infection and possibly tumors; on the other hand, a hyperactive immune system may cause fatal disease, as in the case of a over-whelming allergic reaction to the sting of a bee. In another series of derangements the immune system may lose its normal capacity to distinguish self from non-self, resulting in immune reaction against one's own tissues and cells.<sup>1</sup> Disorders of immune system include hyper sensitivity reactions, autoimmune diseases, immunodeficiency syndrome and amyloidosis. The most important systemic autoimmune diseases include rheumatoid arthritis, systemic lupus erythematosus, sjogren's syndrome, inflammatory myopathies, scleroderma and polyarteritis nodosa. Organ specific autoimmune diseases include ulcerative colitis, myasthenia gravis, autoimmune thrombocytopenia, hashimoto's thyroiditis and autoimmune atrophic gastritis of pernicious anaemia. It is obvious that autoimmunity results from the loss of self tolerance. Self tolerance refers to lack of responsiveness to an individual's own antigen and it underlies our ability to live in harmony with our cell and tissues.<sup>2</sup> In Ayurvedic perspective homeostasis of our body is maintained by the proper function of dosa, agni, dhatu and proper excretion of mala. To maintain the immunological tolerance, four factors are very important. The concept of "shamana" stands for bringing down the increased dosa to normal without expelling them out and not interfering with the dosa which are normal.<sup>3</sup> The term "Samikaroti" is very important from immunological point of view. "Samikaroti" signifies equilibrium of immunological substances to keep the body in a state of "immunological tolerance". The concept of "rasayana"<sup>4</sup> stresses on promotive treatment. Drugs which ward off old age and diseases are rasayana<sup>5</sup>. The drug gulancha (*Tinospora cordifolia*) is regarded as both sansaman and rasayana. By the constant use of rasayana one attains longevity, memory, intelligence and brilliance<sup>6</sup>. Four drugs are mentioned as medhya

rasayana. They are mandukparni, yasthimadhu, gulancha and sankhapuspi. Other important rasayana drugs include "triphala rasyana", silajit rasayana and pipalli.

The essence of immunomodulation is that a pharmacological agents acting under various doses and time regimens display an immunomodulatory effect<sup>7</sup>.

Immunomodulation can be divided into three types :-

1. Immunosuppressants
2. Immunostimulants
3. Immunoadjuvants

For example Neem which contains tannins shows immunosuppressant activity; turmeric which contains curcumin has immunosuppressant activity; Tulsi which contain saponins shows immunomodulatory activity. In this review attempt has been made to emphasize the experimental work on immunomodulatory activity of various Ayurvedic drugs.

***Tinospora cordifolia*** (Family- Menispermaceae) Gulancha is mentioned as rasayan drug. It is the drug of choice in vatarakta<sup>8</sup>. Immunomodulatory and antitumor actions of *Tinospora cordifolia* are mediated through activation of tumor associated macrophages. Intraperitoneal administration of *Tinospora cordifolia* extract in tumor bearing mice not only augments the basic function of macrophages such as phagocytosis but also their antigen presenting ability and secretion of IL-1, TNF-alpha and other cytokines. At a dose of 10mg/kg (in vivo) the aqueous and ethanolic extract of *Tinospora cordifolia* significantly increased the antibody production against SRBC in animals when compared to control. The methanolic extract of *Tinospora cordifolia* stem extract showed to increase the total W.B.C count and bone marrow cellularity. The extract also increased humoral immune response, by releasing the plaque-forming cells in the spleen and enhances macrophages activation<sup>9</sup>.

## ***Glycyrrhiza glabra***

It is mainly used in pitta, vata and rakta prakop. It is very

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useful in vrana and sotha. The root extract was investigated and it was found that crude polysaccharide fraction of the shoot and hairy root of *Glycyrrhiza glabra* induced nitric oxide production by murine peritoneal macrophages in vitro. In addition the polysaccharide of *Glycyrrhiza glabra* dose-dependently improved immune and antioxidant enzyme activities in mice. Glycyrrhizin and beta glycyrrhetic acid are the major component of *Glycyrrhiza glabra* believed to have immunomodulatory properties<sup>11</sup>.

#### ***Centella asiatica***

It is mentioned as rasayan drug and useful in raktavikar, kustha, pandu and meha<sup>12</sup>. It is reported that *Centella asiatica* extract and its main constituent asiaticoside possesses immunomodulatory activity, acting by increasing phagocytic index and total WBC count. In human peripheral blood mononuclear cells (PBMCs) *Centella asiatica* (water extract) significantly increases proliferation and production of IL-2 and TNF-alpha. In contrast, an ethanol extract of *Centella asiatica* inhibited human PBMC mitogenesis and the production of IL-2 and TNF-alpha<sup>13</sup>.

#### ***Terminalia chebula***

Haritaki is rasayan drug and it is used in Kustha, kandu and kamla<sup>14</sup>. The aqueous fruit extract of *Terminalia chebula* has been investigated for its effect on cell mediated and humoral component of the immune system in mice. Administration of *Terminalia chebula* extract produced an increase in humoral antibody titer and delayed type hypersensitivity in mice. *Terminalia chebula* extract has immunostimulant properties<sup>15</sup>.

#### ***Withania somnifera***

It is mainly regarded as rasayan and used in switra<sup>16</sup>. *Withania somnifera* has been revealed as immunostimulator and immunoregulator in immune inflammation animal models. It has been reported that administration of *Withania somnifera* extract reduced leucopenia induced by cyclophosphamide (CP). It may be correlated as this extract could reduce the CP induced toxicity and its usefulness in cancer therapy. There is an enhancement in the circulating antibody titre and the number of plaque forming cells in the spleen was observed after administration of *Withania somnifera* extract. It was also found that methanolic extract of *Withania somnifera* exhibited radioprotective effect in normal BALB/c mice with increased bone marrow cellularity and reduction in chromosomal damage caused by sub lethal dose of gamma radiation. Withanolide activated the murine macrophages, phagocytosis and increased lysosomal enzymatic activity secreted by the macrophages, while also displaying antistress activity and positive effect on learning and memory in rats<sup>17</sup>.

#### ***Ocimum tenuiflorum***

Tulsi is mainly mentioned in kustha and rakta vikar<sup>18</sup>. The fixed oil obtained from *Ocimum tenuiflorum* is reported to possess significant anti-inflammatory, anti pyretic, analgesic and antiarthritic activities. A steam distilled extract of *O. sanctum* leaves has been shown to enhance anti-sheep red blood cells and IgE antibody titre. Alcoholic extract of *O. sanctum* showed immunomodulatory activity in both non-stressed and stressed animals. In non-stressed animal it was found that *O. sanctum* seed oil produced a significant increase in anti-SRBC antibody titre and caused a significant inhibition of antigen induced histamine release from the peritoneal mast cells. The oil also produced a significant reduction in foot pad thickness in mice and percentage leucocyte migration inhibition<sup>19</sup>.

#### ***Piper longum***

Pipalli being a rasayan drug used in kustha, swas, kasa and pandu<sup>20</sup>. Alcoholic extract of the fruits of *P. longum* and its component piperine was studied for immunomodulatory activity. The report revealed that the extract as well as the piperine increase the WBC count, bone marrow cellularity. They also induce total antibody production, total number of plaque forming cells. These effects may be due to combined action of humoral and cell mediated immune response<sup>21</sup>.

#### ***Curcuma longa***

Haridra is mainly used in rakta-vikar. It is used in twak-roga, soth and pandu<sup>22</sup>. The chief constituent of *C. longa* is curcumin, which played a major role for immunomodulatory activity. Bone marrow cellularity, alpha-esterase positive cells and macrophage phagocytic activity were enhanced by curcumin administration. Numerous evidences suggest that curcumin can modulate both the proliferation and activation of T cells. It was reported that curcumin inhibits the proliferation induced by PMA and anti CD28 antibody or that induced by PHA of T lymphocyte isolated from healthy donors<sup>23</sup>.

#### ***Azadirachta indica***

Neem is used in kustha and pandu<sup>24</sup>. Aqueous extract of stem bark has been shown to enhance the immune response of Balb-c mice to sheep red blood cells in-vivo. The aqueous extract showed strong anticomplementary effect dose, time dependently and most pronounced in the classical complement essay. In addition, a dose dependent decrease in the chemiluminescence of polymorphonuclear leucocytes and a dose dependent increase in the production of migration inhibition factor by lymphocytes were also observed. Neem oil has been shown to possess immunostimulant activity by selectively activating the cell-mediated immune mechanisms to elicit an enhanced response to

subsequent mitogenic or antigenic challenge. Neem oil also possesses immunomodulatory effect in mice. The intraperitoneal injection of neem oil in mice showed increase in leucocytic cells after 3 days of treatment. In addition, the peritoneal macrophages of mice exhibited enhanced phagocytic activity and expression MHC class -2 antigen. Nimbidin is a mixture of tetranortriterpenes and is the major active principle of the seed oil of *A. indica* possessing potent anti-inflammatory antiarthrit activities by inhibiting some of the functions of macrophages and neutrophils relevant to the inflammatory response following in vivo and in-vitro exposure<sup>25</sup>.

#### *Aloe vera*

Being rasayana drug ghratakumari is used in pitta, rakta and twak roga<sup>26</sup>. The effects of *Aloe vera* on micro-circulation and levels of TNF-alpha and IL-6 were investigated in rats and after inducing burn. It was found that the amount of leucocyte adhesion was significantly reduced in the *Aloe vera* treated burn wound rats compared to rats in the control group. It was also observed that the levels of TNF-alpha and IL-6 reduce significantly. Dihydrocoumarin derivative were isolated from *Aloe vera* which exhibited immunomodulatory activity in relation to increasing the phagocytic activity and stimulating the production of superoxide anions in the oxygen respiratory burst of rat peritoneal macrophages<sup>27</sup>.

#### *Allium sativum*

Immunomodulatory effect of garlic or selected garlic constituents showing increased T-lymphocyte blastogenesis and phagocytosis, as well as modulation of cytokine production. Garlic extract showed variety of anti-allergic and antitumor activity through tumor cell growth inhibition and chemopreventive effects. They demonstrated that histamine release in the rat basophil cell line RBL-2H3 was induced by mouse anti-trinitrophenyl (TNP) monoclonal antibody and the TNP-bovine serum albumin (BSA) hapten carrier complex. Oral administration of extract (10ml/kg) also decreased 25-45% of the ear swelling, used as an index of immunoglobulin IgE mediated skin reaction. In the psychological stress model, the extract significantly prevented the decrease in spleen weight and resored the reduction of anti-SRBC hemolytic plaque forming cells caused by the electrical stress.

It is also reported that at low concentration garlic extract significantly reduced that IL-2 production, but IL-10 production was increased. The TNF alpha, IL-1, IL-6, IL-8, T cell interferon gamma were observed to decreased significantly with the extract<sup>28</sup>.

#### Conclusion

From the review it is clear that modern technological advancement has proved mechanism of action of

different Ayurvedic drugs for immunomodulation. Successful treatment of tamak swasa, eka kustha and vatarakta ascertain that Ayurvedic drugs are rich sources of immunomodulation. More research in this field can discover many new treatments even for cancer and AIDS.

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# EXTRA CARDIAC PHARMACOTHERAPEUTIC PROPERTIES OF *TERMINALIA ARJUNA* (ROXB.) W & A

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## Abstract

To cure human diseases, medicinal plants have been a major source of therapeutic agent since ancient time. *Terminalia arjuna* is one of the widely used medicinal plant throughout India. It belongs to family 'Combretaceae' and grows well along bank of streams, rivers, dry water courses. *Terminalia arjuna* hold a reputed position in both Ayurvedic and Unani system of medicine. In ancient texts, like Charaka samhita, *Arjuna* is categorised under *udardaprashaman* group (C.S. SU 4), Brihatrayi have indicated if for raktapitta, arshas, kustha, prameha, mutraghata, and vrana. It was Acharya Vagbhata who for the first time indicated *Arjuna* for its tremendous use in treating heart diseases. Since then it is used mostly as cardiac tonic by Ayurvedic physicians. This plant has been reportedly to contain active constituents which proved to be effective pharmacological agents as antimicrobial, anticancer, antiacne, anti diabetic, antihelminthic, anti-inflammatory and so on. Therefore, this article is to evaluate the therapeutic properties of Arjuna other than its Hridya property.

**Key words :** Terminalia arjuna, phytochemicals, anti diabetic.

## Introduction

*Terminalia arjuna* (Roxb.) W & A is one of the widely used medicinal plant throughout India. It belongs to family 'Combretaceae' and grows well along bank of streams, rivers, dry water courses. *Indradru*, *Kakubha*, *Dhavala*, *Viravrksa*, *Nadisarja*, *Partha* are the synonyms of *Arjuna*. *T.arjuna* is evergreen tree, 20-25 meters in height, 2-2.5 meters in diameter at breast height and has spreading branches. The bark is smooth, whitish outside and pinkish on inner side, peeling out in thin flakes, odourless, gritty, and astringent. The plant sheds its bark once in a year like the snake's skin. The leaves are hard, sub-opposite, coriaceous, 10-20 cm. long, oblong or elliptical oblong, margin often crenulate, apex obtuse or sub acute; petioles 0.5- 1.2 cm; gland usually two, flowers yellowish white in colour, sessile, in short axillary spikes, the fruits are ovoid with 5-7 equal wings, the flower bloom in March- June and fruits occur in September-November. All the parts, mainly bark is used for therapeutic beneficiary effect from ancient times. *Arjuna* is astringent in taste (*rasa*), pungent in the post digestive effect (*vipaka*), very cold in potency (*virya*), and has *laghu* (light) and *ruksa* (dry) attributes. It alleviates the *kapha* and *pitta* dosas, but vitiates the *vata* dosha. It is very effective heart tonic<sup>1</sup>

## Classical Categorization :

**Caraka :** Udardaprasamana, Kashaya skandha

**Susruta :** Nyagrodhadi, Salasaradi

**Vagbhata :** Viratarvadi, Nyagrodhadi gana, Asanadi gana

## Methods of Collecting Bark :

At present, the bark of *T. arjuna* is being extracted through unscientific and destructive harvesting techniques, like by making blaze too deep and wide.

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which damage the cambium and ray cells, which are responsible for the transport of nutrient and water from roots to other parts of the tree. This type of commercial harvesting affect the tree population . Although its bark completely regenerates after it has been damaged, but is vulnerable to fungal or bare attack, once the bark is removed. Therefore, only 1/3<sup>rd</sup> of the mature bark on total girth of the tree should be removed leaving the inner bark for regeneration. The bark should be dried in sun before storage<sup>2</sup>

## Properties as per various Ayurvedic texts:-

ककुभः शीतलो हृद्यः क्षतक्षयविषास्त्रजित् ।

मेदोमेहद्रणन् हन्ति तवुरः कफपित्तहृत् ॥

(भ • प्रा • 5 / 27)

According to Bhavprakash, *Kakubh* (*Arjuna*) has astringent, cooling property, and is cardiac tonic, wound healer, aphrodisiac, and is useful in obesity, urinary problems, used in vitiated condition of kapha-pitta.<sup>3</sup>

ककुभस्तु कषायोष्णः कफघ्नो द्रणनाशनः ।

पित्तश्रमतृषार्तिघ्नो मारुतामयकोपनः ॥

(घा • नि • 15 / 109)

*Arjuna* is astringent, hot, anti kapha and a wound healer. It alleviates fatigue, thirst and Pitta but aggravates the diseases due to Vata<sup>4</sup>

पार्थः क्षतेऽनिले भग्ने रक्तस्तम्भे बलेहितः ॥ (शो • नि •)

*Arjuna* (*Partha*) is useful in wound healing, fracture healing and haemostasis. It acts as Vatahara and is Balya.

## Chemical Constituents-

Different types of bio-active compounds have been isolated from this medicinal plant. Major chemical constituents in different parts of *T.arjuna* are:<sup>5</sup>

COMPOUND	STEM/BARK	ROOT
1. Triterpenoids	Arjunin, Arjunic acid, Arjunolic acid, Arjungenin, Terminic acid.	Arjunic acid, Arjunolic acid, Oleonolic acid, Terminic acid, Arjunoside I-IV, Glucopyranoside.
2. Glycosides	Arjunetin, Arjunophthanolside, Arjunoside I,II, Terminoside-A.	Arjunoside I-IV, Glucopyranoside.
3. Sitosterol	Bsitosterol	Sitosterol
4. Flavonoids	Arjunolone, Arjunone, Bicalein, Luteolin, Gallic acid, Ethyl gallate, Kempferol, Proanthocyanidins, Quercetin, Pelargonidin	
5. Tannins	Pyrocatechols, Casuarinin, Casurin, Punicallin, Punicolagin, Castalagin, Terchebulin, Terflavin C.	
6. Traces elements	Calcium, Aluminium, Magnesium, Silica, Zinc, Copper	

It was initially reported that the bark had 34% ash content consisting entirely of pure calcium carbonates. The water extract contains 25% calcium salts and 16% tannins, whereas alcoholic extract contains very little colouring matter and tannins (Dymock et al, 1891). According to Ghoshal, the root contains: sugar, tannin, colouring matter, a body of the nature of glycosides, and carbonates of calcium and sodium and traces of chlorides of alkali metal. <sup>6</sup>

### Some of The Reported Pharmacological Activities of *T. Arjuna*:

*Arjuna* contain valuable and cheap source of active constituents which are proved to be effective pharmacological agent against various diseases. Some of them are:-

#### 1. Anti cancer activity

- Extract of *T. arjuna* is reported to enhance percentage of life span of experimental animal induced with DLA (Dalton 's lymphoma ascites) tumour cells and in some cases induced with carcinogens. It also induces ROS production in HepG2 cells and consequently causes apoptosis.<sup>7</sup>
- Casuarin from the bark induces apoptosis and cell cycle arrest in human breast adenocarcinoma MCF cells. Casuarin, a hydrolyzable tannin isolated from the bark of *T. arjuna* inhibited the proliferation of MCF -7 by blocking cell cycle progression in the G0/ G1 phase and induced apoptosis.<sup>8</sup>

#### 2. Role In Liver Diseases

- In case of liver cirrhosis, *T. arjuna* possesses diuretic and a general tonic outcome.<sup>(9)</sup> Aqueous extract of *T. arjuna* has the potential therapeutic value in the treatment of Isoniazid induced hepatic damage and some liver diseases. Hepatoprotective activity of the plant may be due to its antioxidant principle.

- *T. arjuna* has the capability to protect the liver and kidney tissue against CCL<sub>4</sub> induced oxidative stress by increasing antioxidative defense activities.<sup>5</sup>

#### 3. Anti Platelet aggregation activity:

The active principle responsible for the anti platelet aggregation activity is in the alcoholic extract of the plant. The administration of alcoholic extract of *T. arjuna* results into prolongation of prothrombin time and increase in euglobin lysine time in rabbit. It also results in significant inhibition of platelet aggregation. Platelet adhesiveness contributes significantly to atherosclerosis. Platelet adherence and aggregation are augmented in hypercholesterolemia which has high resting level of thromboxane A<sub>2</sub>. The calcium content of plasma membrane and cytosol of platelets is altered by hypercholesterolemia resulting into platelet hyperactivity. Hypercholesterolemia may also exert its effects by altering the activities of endogeneous vascular regulation of platelet activity such as PGO 2 and nitrous oxide. Platelets aggregation ultimately precipitates acute occlusion of arteries in which vascular endothelium is already disrupted. *T. arjuna* bark extract is known to reduce circulatory platelet aggregates.

#### 4. Anti fungal property

Casuarin, a hydrolysable tannin isolated from the bark, exhibit antiherpes virus activity by inhibiting viral attachment and penetration. Moderate antifungal activity against *C. albicans*, *C. krusei*, and *C. paropsillaris* was exhibited by a mixture of arjunic acid with minimum inhibitory concentration (MIC) values in the range of 50-200 µg/ml. <sup>5</sup>

#### 5. Anti diabetic property :

*T. arjuna* bark extract has potential effects on diabetes. Study on diabetic rats shows that its extract showed two enzymes (glucose -6-phosphatase, fructose -1,6 diphos-

phatase) significantly reduced in liver and kidney. This has effect on increasing insulin secretion which can affect repression of the gluconeogenic key enzymes. *T.arjuna* bark extract exhibit antidiabetic activity by enhancing the peripheral utilization of glucose. This effect may be due to the presence of tannins, saponin, flavonoids, and other constituents present in the bark, which could act synergistically or independently in enhancing the activity of glycolytic and gluconeogenic enzymes.<sup>5</sup>

#### 6. Anti acne activity :

Topical formulations of *T.arjuna* extract containing flavonoids (FF I to III) and tannin fraction (TF I to III) have been developed which were examined for anti microbial activity against Propionibacterium acnes and staphylococcus epidermis. The formulation of FF-III (cream containing 2% of flavonoids fraction) has showed higher anti bacterial activity against P. acnes and S. epidermidis than other formulations. Herbal anti acne cream is non toxic, safe and effective.<sup>5</sup>

#### 7. Anti helminthic activity :

Anti helminthic activity of *T.arjuna* bark may be mainly due to tannin content that binds with a free protein existing in the tubes for larval nutrition and reduced nutrient availability resulting in larval starvation or decreased gastrointestinal metabolism by directly inhibiting the oxidative phosphorylation therapy causing larval death.<sup>5</sup>

#### 8. Wound healing activity :

*T.arjuna* has the capability to complete epithelisation of excision wounds and increase tensile strength of incision wounds.<sup>5</sup>

#### 9. Anti asthmatic activity :

The anti asthmatic and anti anaphylactic activity may be due to mast cell stabilizing potential and inhibition of antigen induced histamine and acetylcholine release.<sup>5</sup>

#### Miscellaneous

- It has also a preventive role against arsenic induced cellular oxidative stress.<sup>5</sup>
- The anti oxidant property of flavonoids are due to several different mechanism such as scavenging of free radicals, chelating of metal ions such as iron and copper, inhibition of enzymes responsible for free radical generation.<sup>10</sup>
- Arjunolone, a flavonoid from the bark is reported to be useful for female contraception (Satyavati,1983)<sup>13</sup>
- In one study, its ulcer protection property in stomach is similar to Ranitidine ( associated with ethanolic acid).<sup>9</sup>
- It reverses impaired endothelial function in chronic smokers. Smoking, largely through increased oxidative stress causes endothelial dysfunction,

which is an early key event in atherosclerosis. *T.arjuna* therapy for 2 weeks lead to significant regression of this endothelial abnormality amongst smokers.<sup>11</sup>

- According to Acharya Shushruta, Spermatorrhea is relieved with the decoction of arjuna bark and sandal wood.( s.s.ci. 11/10)<sup>12</sup>
- With milk, it is given in fractures and contusions with excessive ecchymosis it promotes the union of fracture.<sup>6</sup>
- It relieves the leucorrhoea and excessive menstrual bleeding.
- Powdered Arjuna bark impregnated with Vasa juice several times should be taken with ghee, honey and sugar candy. It alleviates congestion, cough, and intrinsic haemorrhage.<sup>12</sup>

#### Conclusion :

From the above references here we can conclude that Arjuna is considered to be an ideal agent for treating cancer, coronary heart diseases, congestion, diabetes and many more diseases, but in the present era there is hardly any physician who uses Arjuna bark for problems other than cardiac problems. So, medicinal plants like Arjuna which are valuable and cheap sources of unique phytoconstituents can be used extensively in the development of drug against various diseases. So efforts should be made to carry out further researches on medicinal plants and create awareness among Ayurvedic physicians about their uses in different diseases.

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# PHYLLANTHUS AMARUS (BHUMYAMALAKI): AN AYURVEDIC HERB AGAINST CHRONIC HEPATITIS B

## Dr. Harbans Singh

Hepatitis-B is one of the major problems in the medical world and the chronic asymptomatic carriers pose a challenge to the physicians. Chronic Hepatitis B afflicts nearly 400 million people worldwide. India has over 45 million HBV carriers that account for 10-15% of the entire pool of HBV carriers worldwide. Of the 25 million infants born every year in India, it is estimated that over 1 million run the lifetime risk of developing chronic HBV infection. Every year, over 100,000 Indians die due to illnesses related to HBV infection. Chronic Hepatitis B infection is a leading cause of liver cirrhosis and hepatocellular carcinoma (HCC). Hence slogan has been given to Hepatitis B as the 'Carriers of Cancer'. Hepatitis B is claimed to be 100 to 200 times more infectious than AIDS and kills more people in a day compared to that done by AIDS in one year. Unfortunately it has not received the attention that it deserves, while the disease like AIDS got all the media headlines and funds. It has poor prognosis when compared to other infective conditions of the liver<sup>2</sup>. In spite of latest vaccines, interferon-alfa and limivudine, the chronic asymptomatic carriers HBV and its complications still do not have appropriate drugs in modern medicine. The use of herbal drugs available in the nature for the alleviation of human suffering has been a continuous process from the echoes of primitive ages to the present planned drug research era. Ayurveda, in its herbarium has a lot of hepatoprotective herbs which can fill up this gap. Clinical research and various experimental studies in the recent time have confirmed the efficacy of several plants in the treatment of Hepatitis B, while basic scientific research has uncovered the mechanism by which some plants provide their therapeutic effect.

Modern medical researchers have shown that extract of *Phyllanthus spp.* (Family-Euphorbiaceae) inhibits the reaction between HBsAg (surface antigen of HBV) and the antibody (Anti HBs) to it and also inhibits the activity of endogenous DNA polymerase of HBV.

**PHARMACOLOGY:** The drug exhibits anti-viral action on Hepatitis B in human subjects (*Thyagarajan et al, 1982*) and in vitro (*Yeh S.F et al, 1983*). The crude extracts as well as a red pigment obtained by TLC purification showed potent in vitro immune inactivating ability against HBsAg which was maximum at 37°C (*Thyagarajan et al, 1982*).

Part used	- Whole plant, fresh leaves and roots.
Dosage	- Powder 3-6 gm twice daily. Dry Extracts 300-600 mg twice daily.
Therapeutic category	- Anti-Viral



Figure: 1. *Phyllanthus amarus* (*Bhumyamalaki*)

### Adulterants:

Commercially sold as '*Bhumyamalaki*' is adulterated with one and more species of *Phyllanthus*, such as *P. fraternus*, *Purinaria*, *P.simplex* and *P.maderaspatensis*. Assessment of bitterness value is powerful tool to differentiate *P.amarus* from other species as the bitterness value of former is 70 times more than *P. fraternus*, *Purinaria*, and *P.simplex* and 14 times more than *P.maderaspatensis*.

### Clinical trials of *phyllanthus amarus* (*Bhumyamalaki*)

1) "***Phyllanthus amarus* suppresses hepatitis B virus by interrupting interactions between HBV enhancer I and cellular transcription factors**".<sup>3</sup>

The *Phyllanthus amarus* plant suppresses HBV mRNA transcription in vitro and exhibits therapeutic potential in chronic HBV carriers, although further work is necessary to define its mechanism of action. Analysis in HuH-7 cells with transfected plasmids using luciferase, showed that *P.amarus* specifically inhibited HBV enhancer I activity. To identify the mechanism of this HBV enhancer I inhibition, liver enriched cellular transcription factors were co-expressed in HuH-7 cells. The C/EBP alpha and beta had no effect upon the HBV enhancer I activity. In contrast, co-transfection of HNF-I alpha or beta as well as HNF3 alfa and beta transcription factors, significantly up regulated the HBV enhancer I activity. Exposure to *P.amarus* inhibited C/EBP alpha- and beta-mediated up regulation of HBV enhancer I

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activity in a dose-dependent manner, whereas HNF3 alpha and beta mediated up-regulation of HBV enhancer I was unaffected. In vitro gel shifts showed that *P.amarus* inhibited complexing of C/EBP transcription factors to a consensus oligonucleotide sequence, whereas DNA binding of AP-1 and SP-1 transcription factors was unaffected. As *P.amarus* down regulates HBV mRNA transcription by a specific mechanism involving interactions between HBV enhancer I and C/EBP transcription factors, purification and further analysis of the active *P.amarus* component will advance insights into its anti viral activity.

**2) “*Phyllanthus amarus* down-regulates hepatitis B virus mRNA transcription and replication”:<sup>4</sup>**

The *Phyllanthus amarus* plant shows potential for treating hepatitis B virus. To define the mechanism of action of *P.amarus*, we used HepG2 2.2.15 cells, which support hepatitis B virus replication. *P.amarus* inhibited hepatitis B virus polymerase activity, decreased episomal hepatitis B virus DNA content and suppressed virus release into culture medium. To examine transcriptional control mechanisms, we used G26 hepatitis B virus transgenic mice, which produce serum HBsAg but neither HBeAg nor virion particles. When *P.amarus* was administered to transgenic mice, hepatic HBsAg mRNA levels decreased, indicating transcriptional or post transcriptional down-regulation of the transgene. Increase in hepatitis B virus mRNA expression after stimulation of the glucocorticoid responsive element was also suppressed by *P.amarus*, suggesting involvement of the hepatitis B virus enhancer in this response. Disruption by *P.amarus* of hepatitis B virus polymerase activity, mRNA transcription and replication supports its role as an antiviral agent.

**3) “*Effects of Phyllanthus spp (Bhumyamalaki) on chronic carriers of hepatitis B virus*”:<sup>5</sup>**

With *Phyllanthus spp (Bhumyamalaki)*, 59% of the treated patients lost HBsAg after the treatment as compared to only 4% controls. In no case, the surface antigen returned up to 9 months. Clinical observations revealed no toxic effects. In carrier patients, positive for HBsAg but negative for HBeAg, 93% cleared the carrier stage. In HBsAg and HBeAg positive carriers but negative for anti HBe IgM, 44% patients were cleared. Patients positive for all the three markers, 13% were cleared. In treated carriers positive for HBsAg, anti HBe IgM but negative for HBeAg, 67% lost the carrier stage. The mode of mechanism suggested is by inhibiting the reaction between HBsAg (surface antigen of HBV) and the antibody (anti HBsAg) and by inhibiting the endogenous DNA polymerase of HBV.

**4) “*A comparative study of Phyllanthus amarus compound and interferon in the treatment of chronic viral hepatitis B*”:<sup>6</sup>**

Fifty five patients with chronic viral hepatitis B were

randomly divided into two groups. Thirty patients were treated with *Phyllanthus amarus* compound (PACo) for three months. In the second treatment group another 25 patients were treated with domestic recombinant human interferon alpha-1 b (IFN-alpha 1b) for three months as controls. The total effective rate in the treatment group was 83.3% showing no significant difference from the control ( $p>0.05$ ). The normalization rates of ALT, A/G \ and SB in the treatment groups were 73.3%, 80.0% and 78.2% respectively, which were significantly higher than that in control ( $p<0.05$ ). It is indicated that PACo (*Phyllanthus amarus* compound) has remarkable effect for chronic viral hepatitis B in recovery for liver function and inhibition of the replication of HBV.

**5) “*In vitro effect of Phyllanthus amarus on hepatitis B virus*”:<sup>7</sup>**

In a preliminary study, carriers of hepatitis B virus, treated with a preparation of the plant 200 mg for 30 days, 22 out of 37 (59%) treated patients had lost hepatitis B surface antigen, when tested 15-20 days after the end of treatment, compared with only 1 out of 23 (4%) placebo treated control. In another study, it has exhibited an inhibition of DNA polymerase on hepatitis B virus and a viral agglutinating activity.

**Conclusion:**

*Phyllanthus amarus (Bhumyamalaki)* is a very important and safe drug for treating clinical conditions like Hepatitis B and its carriers. It is freely available in Indian sub-continent. It can be given in the form of decoction made from 10gms of crude drug by the native population. It can also be given as dry powder in the dosage of 3 to 5gms twice daily. The extract of this drug should be given in a dose ranging 300-600 mg twice daily. Extracts of *Phyllanthus amarus* inhibit the reaction between HBsAg (Surface Antigen of HBV) and the antibody (anti HBs) to it and also inhibit the activity of endogenous DNA polymerase of HBV.

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# PUBLIC HEALTH AND CLINICAL MEDICINE - TWO FRUITS OF THE SAME TREE

**Dr. Tanmay Subhash Bagade**

## **Introducing Public Health:**

Public health has become a complementary science to the entire medical faculty across the world. It is not only the broader approach towards health problems, but is also the most effective method of reducing the disease burden across the world. From focus on Millennium development goals like ending poverty, improving maternal and child health, etc., public health professionals also work towards reducing the impact of climate change on the environmental health of communities and countries. WHO defines Public Health as 'all organized measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases' (WHO, 2014).

Thus, public health is concerned with the total system and not only the eradication of a particular disease. The three main public health functions are (WHO, 2014):

1. The assessment and monitoring of the health of communities and populations at risk to identify health problems and priorities.
2. The formulation of public policies designed to solve identified local and national health problems and priorities.
3. To assure that all populations have access to appropriate and cost-effective care, including health promotion and disease prevention services.

Public health professionals monitor and diagnose the health concerns of entire communities and promote healthy practices and behaviours to ensure that populations stay healthy. One way to illustrate the breadth of public health is to look at some notable public health campaigns (WHO, 2014):

- Vaccination and control of infectious diseases.
- Motor-vehicle safety.
- Safer workplaces.
- Safer and healthier foods.
- Safe drinking water.
- Healthier mothers and babies and access to family planning.
- Decline in deaths from coronary heart disease and stroke.
- Recognition of tobacco use as a health hazard.

## **Linking Public Health and Clinical medicine:**

The recent success of making India and all countries in South East Asia Polio free is credited to the efforts of good Public health policies. The credit of this success also goes to vast clinical research on polio. Public health and Clinical medicine have always been regarded as two important approaches of world health. Evolution of Modern Public health policies and advances in clinical care of individuals, together have changed the healthcare scenario of today's world. Though there are differences in both these systems of healthcare, they are interlinked and interdependent on each other and have to function together towards achieving the health goals for the community.

Theodore et al (2009), suggest that '*the value of clinical medicine to public health and vice versa has not always been clear, neither to public health personnel, nor to clinicians*'. The achievements of public health policies in controlling disease epidemics and reducing mortality in non-communicable diseases are in reality, a shared achievement between public health and clinical medicine. The latest Human Development Report (UNDP, 2013) shows that due to major advances in public health and clinical medicine, that the world is becoming less unequal. The economic progress of many countries, mainly India and China, have lifted millions of people out of extreme poverty.

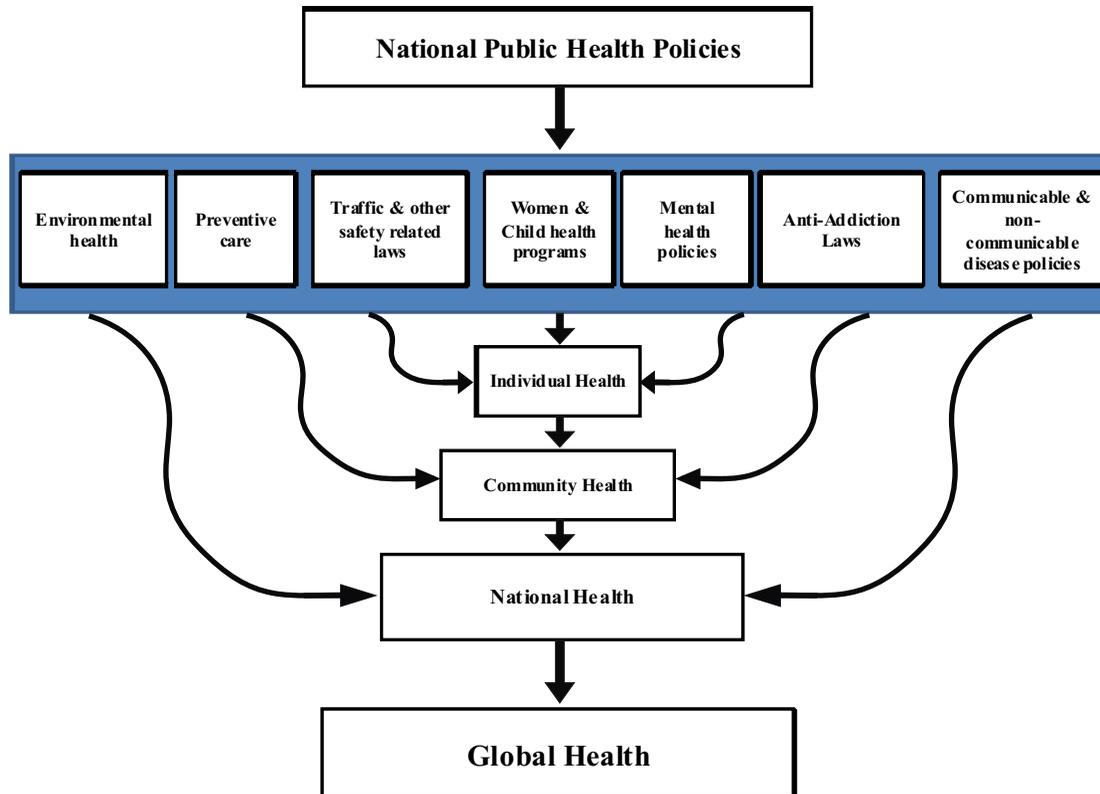
Historically, healthcare was given importance in many ancient civilizations like Egyptian, Greek, Indian, etc. Historical evidences show that clinical medicine was integrated in public health and both played their part in achieving health with whatever resources were available (Theodore et al, 2008). After the Second World War, formation of UN and (later WHO), '*organised healthcare*' became the top most priority agenda for all the nations. Strategies developed in the next few decades laid the foundations of today's new public health and modern medicine.

In the book, *Healing the Schism*, Kerr White (1991) notes that "*the two cultures, 'medicine' and 'public health' seem to live in different, often unfriendly worlds*". Public Health is more global and has a futuristic approach to health challenges of community. These approaches can impact multiple levels of healthcare system, including clinical medicine (Figure. 1). New

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Public health based on the Ottawa Charter of WHO (1996) has become a chief part of many government policies. Poverty reduction, environment protection, laws about alcohol, smoking, traffic, etc., all are public health policies which can indirectly affect the health of whole community and in long term, the global health.



**Figure 1: Impact of National Health policies at multiple levels of health care system.**

In contrast to preventive and social aspect of public health, Clinical medicine is more focussed towards disease and its impact on the individual. Modern medicine is still evolving with use of modern technology and vast research. Management of all diseases irrespective of its national importance and independent on government policies, is the chief highlight of clinical medicine.

While the concepts of Public health think about the future health of populations, medicine concentrates only on the cure of a disease at a particular moment. Education for prevention of disease is the most distinguishing factor of public health.

#### **Discussion:**

In spite of different approaches, the goal of both these streams has remained unchanged that is, to achieve *'health for all'*. Both have specific functional role and importance in the health system. Health impact assessment has become a major tool to aid political decisions (John, 2008). National and Global public health policies are defined on the basis of combined research in the field of medicine and socio-economic impacts of health determinants in population. Global health statistics have shown a steady improvement in life expectancy of people, mainly decline in maternal and child mortality rates (WHO, 2013). This was possible only because of successful public health policies and improved medical care.

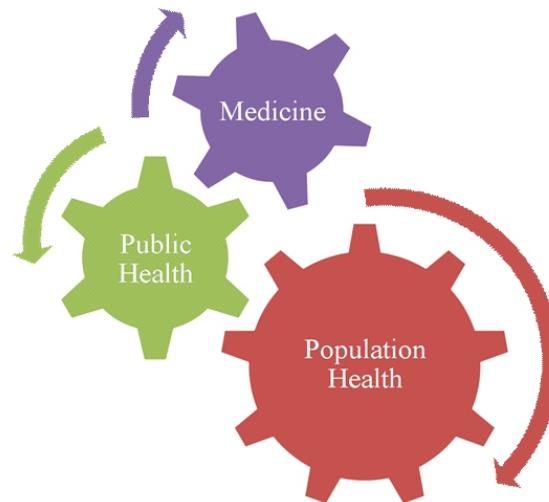


Figure 2: Relationship of Public Health, Clinical Medicine and Population Health

The significant population and industrial growth in the recent times has affected global health scenario. Apart from the previous health challenges, Environmental and socio-economic factors have shown increased prevalence of Non-communicable diseases (WHO, 2010). It has also influenced individual and government spending in developed as well as developing countries. This has made public health and clinical medicine work more closely than ever before.

Chronic diseases like Diabetes, Cardio Vascular Diseases, Cancers, etc. pose a threat for future health of global population. Apart from their high mortality, the individual morbidity like disability and frequent hospitalizations has become a 'burden of diseases' for many countries. Health systems have to cope up with this fast change and solutions have to be sought to this growing problem. It won't be possible for Public health or Clinical medicine alone to reduce this problem and both these "cultures" have to bridge the gap and integrate a specific strategy for this problem. Medical care of individuals will always be influenced by public health policies of the government and vice versa. The inclusion of Public health in Medical education has become not only important, but also necessary for the broader impact it will have on the future health leaders of any country.

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# NUTRITION AND AYURVED

**Dr. Charu Sharma \*** **Prof. Y.K.Sharma\*\***

Nutrition also called nourishment or aliment is the provision to cells and organism of the materials necessary in form of food to support life. This is not only necessary to sustain life but also to prevent common health problems and repair damaged tissues. Nutrition is different from diet as diet is food contents which we consume. Diet consists of Macro and Micro nutrients where as nutrition is cumulative effect of digested, absorbed and metabolized food.

Human body contains chemical compounds such as Water, Carbohydrates, Amino acids, Fatty acids, Nucleic acids made of elements Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus, Calcium, Iron, Zinc, Magnesium etc. These are integral part of body structure and function. Food consists of nutrients essential for body They are:

## Macronutrients

e.g. carbohydrates including fibre, fats, proteins, water, etc.

## Micronutrients

e.g. Minerals, Metals, Vitamins, Phytochemicals, Antioxidants, etc. These influence Energy generation & Conservation, Tissue building & Repair etc.

Food is important, not only for physical well-being and functionality but is also essential for mental well-being and functionality. Healthy eating has a positive effect on cognitive functions and memory. Nutrition therapy is an essential component of disease management e.g. in disorders like:

- Metabolic syndromes
- Mental disorders
- GIT disorders
- Cancers
- Electrolyte imbalances
- Others

## Ayurved and Nutrition:-

Fundamentally Ayurveda perceives that nutrition of body is based on Tri-Upstambha or Three secondary pillars of life namely:

1. Ahaar Food or Diet
2. Nidra Rest and Sleep
3. Brahmacharya Moral code of life

Out of three, ahaar holds the major stake in body nutrition.

## What constitutes ahaar?

Ayurved divides food components taken orally into four varieties i.e.

1. Aashit Soft food e.g. Rice
2. Peeta Fluids e.g. Milk, Water
3. Leeda Semisolid e.g. Khichri
4. Khadit Coarse food e.g. Salads, Nuts etc.

## Importance of ahaar / nutrition:

- Food is Prana (vitality) or life force of human structure.
- Just as sharir is panchbhautic so is Food.
- Ahaar or food is processed by agni leading to release of poshak ras which is ultimately responsible for dhatu-poshan or body's nutrition
- Body nutrition in Ayurveda means Nutrition of dhatus.

## Are nutritional requirements uniform?

- No, according to Ayurveda nutritional requirements are variable from individual to individual and depend on:

<b>Prakriti</b>	<b>:</b>	<b>Constitution</b>
<b>Ritu</b>	<b>:</b>	<b>Season</b>
<b>Vaya</b>	<b>:</b>	<b>Phase of life</b>
<b>Desh</b>	<b>:</b>	<b>Geography of residence</b>
<b>Kala</b>	<b>:</b>	<b>Time</b>
<b>Agni</b>	<b>:</b>	<b>Digestive capacity</b>

When all these factors regarding selection of food are taken into consideration by individual, that is "Hitahaara" or Samahaara "Ideal food".

## Ideal nutritional state:

Over the time when an individual consumes hitahaara or ideal food and when it is properly processed by body one should achieve:

<b>Sharir Dhatu Pushti (Dosha, Dhatu, Updhatus &amp; Mala)</b>	<b>Ideal Physical and Biological constitution</b>
<b>Bala</b>	<b>Energy</b>
<b>Utsaha</b>	<b>Physical and Mental drive</b>
<b>Varna</b>	<b>Luster / Complexion</b>
<b>Indriya Prasad</b>	<b>Ideal functionality of Special senses</b>
<b>Manobala</b>	<b>Ideal Higher Mental functions</b>
<b>Ayu</b>	<b>Life span</b>
<b>Arogya</b>	<b>High grade immunity</b>
<b>Samriti</b>	<b>Memory and Memory based function</b>

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**Inadequate nutrition:**

Inadequate nutrition of body leads to a state of non-satisfaction or non fulfillment which is expressed in form of:

1. Depletion of (Kshayakar)
  - Bala (energy)
  - Varna (complexion)
  - Pushti (body mass)
2. Regression of (Ksheenkar)
  - Ayu (life span)
  - Shukra (procreativity)
  - Oja (immunity)
3. Disturbed functioning of (Upghatkar)
  - Mana (mental faculties)
  - Buddhi (intellect)
  - Indriya (senses)

Ayurveda believes that inadequate nutrition is “Alakshami utpadak”. Thereby meaning that such a state interferes in one's livelihood or one's professional competency. Besides it promotes “Anulomakshaya” or energy depletion of energy leading to Vata-Rogas.

**What will “atyahaar” or overnutrition lead to?**

Ayurveda believes that over nutrition shall lead to:

- Agnimandata
- Doshprakopa

and such a state thereby is a threat to Bala, Arogya, Varna, Upchaya, Oja, Prabha, Utsaha, Ushma and finally Prana. This is also responsible for “Santarpak Vyadhis” or disorders of over nutrition.

**What is ideal nutrition ?**

Ideal nutrition for individual is derived from “Aashtavidh-vishesh-ayatan” i.e.

<b>Prakriti</b>	<b>content, calorie, nutritive value of food</b>
<b>Samyog</b>	<b>compatibility of contents</b>
<b>Karan</b>	<b>processing of food like cooking, drying</b>
<b>Rashi</b>	<b>quantity / quality of food</b>
<b>Desh</b>	<b>season / place of harvesting / staple food</b>
<b>Kala</b>	<b>seasonal considerations</b>
<b>Upyogasamstha</b>	<b>methodology of consumption</b>
<b>Upbhogta</b>	<b>individual's considerate</b>

**Sources of nutrition:**

Nutrition is derived from various food contents Ayurveda has enlisted twelve food groups with different nutrition values which are as below:

1. Shookdhanya / Cereals - Rich in Carbohydrates
2. Shamidhanya / Pulses - Rich in Proteins
3. Mams / Meat - Rich in Proteins, Minerals, Fat
4. Shaak-varga / Green - Rich in Roughage, Antioxidants, leafy Vegetables, Vitamins, Minerals, Electrolytes
5. Phal-varga / Fruits - Rich in Carbohydrates, Antioxidants, Vitamins, Minerals, Electrolytes
6. Harit-varga / Salads - Rich in Roughage, Vitamins, Minerals, Electrolytes
7. Madhya-varga / Fermented foods - Rich in Carbohydrates, Appetizer, drinks Antioxidants
8. Ambu-varga / Water - Liquids in diet.
9. Goras-varga / Milk and its Products - Rich in Fats, Proteins, Carbohydrates Milk products
10. Ikshu-varga / Sugars - Carbohydrates
11. Kritanna-varga / Preprocessed - Like Pickles, Sauces, Sweets, ready to eat food
12. Aaharyoni-varga - Like Salt, Pepper, Oil, Cinnamon, food adjuncts, etc.

**Specific nutritional guidelines as per age / sex:**

Ayurveda has given specific guidelines for optimum nutrition as per age and stage even in healthy

**1.Children**

- New Born Only Mother's milk failing which Cow's milk.
- 1 to 3 years of age Predominantly Milk with Solid food.
- Above 3 years of age Predominantly Solid food with Milk.

**2.Pregnant Woman:-** There is description of month wise diet schedule depending on period of gestation

**3.Geriatric Age High value -** Laghu Supachya food loaded with Rasayana.

**4.Young Active Growing people :-** Guru Poshak Aahar

**Specific seasonal nutritional instructions:**

Ayurveda believes that depending upon seasons of year, one's nutritional requirements also change to suit one's body homeostasis. Specific dietetic instructions are hence advocated which are given below:

# GERIATRIC WOMEN HEALTH CARE THROUGH AYURVEDA

Dr. B.C. Jana

**Abstract :** Health of the family, society, and nation depends upon the health of women. So, to maintain her health, utmost care and good nutrition is needed from the early part of her life. With increasing life expectancy, women spend one third time of her life under post menopausal period. The post menopausal period is associated with significant increase in the incidence of age related gynaecological and non gynaecological medical problems. For maintainance of health, Ayurveda has advised different regimen like *Rajswala paricharya* (mode of living during menstruation), *Garbhini paricharya* (Antenatal care), and *Sootika paricharya* (Regimen in puerparium), and in the elderly there are three aspects of female health care in Ayurveda i.e *Antah Parimarjana* (internal care), *Bahir Parimarjana* (external care ) and *Sattvajaya* (Mental care).

**Key Words :** Rajanivritti, Menopause, osteoporosis, Rasayana, Shirodhara.

## Introduction:

In the era of information and technology women enjoy a special position in the family, society, nation, and world. Reproductive life of a woman starts from menarche and eventually ceases at menopause. Any change in the reproductive function in women will seriously affect her health and happiness. A woman is one of God's greatest creations. She is different from man in her biology, behavior, and life cycle. Menstruation, conception and motherhood are the exclusive feminine attributes. Stri or women are given a lot of respect in Indian culture and they are often spoken as Goddess Laxmi and Swaraswati.<sup>(1)</sup> Ayurveda is based on vedanta philosophy and accepts the concepts of six stages of human beings.

- i). **Asti** existence in an unmanifested state
- ii). **Jayate** get manifested or come to birth
- iii). **Vardhate**- growth takes place
- iv). **Viparinamate** Undergoes changes as childhood adolescent, youth, old/geriatric etc.
- v). **Adakshiyate** undergoes decline
- vi). **Nashyati**- death.

Menopause consists of 5<sup>th</sup> and 6<sup>th</sup> stage of a woman's life.<sup>(2)</sup> Menopause may be classified as loud menopause and silent menopause. To understand geriatric health care and its management through Ayurvedic way the following points are necessary.

## Aim and Objectives:

To maintain an active fruitful and trouble free life in the post menopausal period.

### (1). Anatomic Physiological change in elderly women

The descriptive anatomy of female reproductive system is not clear in the Ayurvedic classics vis-a-vis modern medical science. The word *Yoni* in Ayurvedic classics refers to entire reproductive system and also to individual

organs separately. The term yoni means which unites or separates. The act of union occurs during conception and act of separation occurs during labour.<sup>(3)</sup> “*Yauti Samyojayati prthak karoti va iti Yonih*”. The female reproductive organs consists of

- i). External genitalia (Vulva),
- ii). Internal genitalia
  - (a) the vagina
  - (b) the uterus
  - (c) the fallopian tubes and
  - (d) the ovaries.

iii) the breast - the female accessory reproductive organs. There are three stages of woman's life childhood, middle age, and old age. The childhood is again sub classified into *Bala* (0 to 10 yrs.), *Kumari* (10 to 12), *Rajomati* (12 to 16 yrs.). This stage of women's life is characterized by predominance of kapha dosa. The middle age is sub divided into *Yuvati/ taruni* (16 to 40), maximum reproductive capacity and full maturity, status of dosha pitta +++, kapha ++, vata +; *Praudha* (40 to 50), premenopausal symptoms evident with dosha status pitta +++, vata ++. The old age is also called *vrddha* (After 50 or 55) with *vata* predominance. The term *artava* is used in Ayurveda text to denote (a) ovum, and (b) Menstrual blood. Normal reproductive physiology depends upon the integrated action of central nervous system, the endocrine glands (Hypothalamus, Pituitary, Ovary, thyroid, and Adrenal gland ), and the reproductive organs. In women, reproductive period is controlled by pitta dosha but as per medical science, oestrogen governs the reproductive life and its deficiency manifests as menopause. Oestrogen transforms a girl into a woman with sexual maturity and exerts three type of effects, i.e. genital effect, effect on secondary sex character, and general effect like ovulation inhibition, fat deposition, smooth soft vascular skin, lower LDL

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cholesterol and increase HDL cholesterol, decrease coronary atherosclerosis, sodium and water retention. Oestrogen also influences female behaviour viz. emotion, psyche, libido, social conduct, sleep, intelligence. Menstruation is the periodic discharge of blood along with other materials (including one unfertilised ovum) from vagina in the reproductive life of a woman usually at an interval of 28 days. The menstrual cycle may be sub divided into five phases menstrual phase, regenerative phase, proliferative phase, secretory phase, and pre menstrual or ischemic phase.

#### Specific stages of menstrual cycle and factors for conceptions in Ayurveda:

Menstrual Cycle is divided into 3 phases (i) **Raja srava kala** (menstrual phase ) 3 to 5 days duration characterised by menstrual blood loss dominated with vata dosha, (ii) **Ritu kala** (proliferative phase including ovulation ) persists for 12 or 16 days characterised by endometrial development, ovulation, chances of fertilization dominated with kapha dosha, and (iii) **Ritu vyatita kala**, 9 to 13 days duration, characterised by towards bleeding phase, less chances of conception raised body temperature and dominated with pitta dosha.

**Menopause in Medical Science and Ayurveda:** It is the cessation of menses for a year or more caused by ovarian failure. It marks the end of women's reproductive life. It occurs normally between the ages of 45 to 55 years and at a mean age of 51 years and is a physiological process as describe in medical science. Sushruta mentioned it as a normal physiological process occurring at the age near about 50 years due to predominance of vata dosha and dhatukshaya. In Ayurveda, menopause is called **Rajanivritti**. *Kala, swabhava, vaya, karma, dhatukshya*, and *abhighata* are the causes of rajanivritti according to Ayurveda. So, Raja nivritti is a marker of aging in women. Older women are exposed to four types of hazards in their life i.e. age related, post menopausal, psychological distress and dependency.

**Aetiology of menopause:** Primarily due to exhaustion of the stock of the oocytes or primordial follicles in the ovary, with a consequent fall in oestrogen and progesterone secretions.

#### Clinical, Metabolic, and Pathologic features during pre, peri, and post menopause:

(1) **Vasomotor symptoms, sleep disturbances and mood changes:-** An intense and often intolerable sensation of heat, usually starting in the trunk and spreading upwards to the neck, face, and forehead, and frequently involving the whole body. Hot flush, sleep deprivation, psychological symptoms like

depression, irritability, short temperedness, anxiety, inability to concentrate, loss of confidence, loss of energy and libido, forgetfulness and poor memory are frequently encountered.

(2) **The target organs of the genital tract, the lower urinary tract, and the breast:-**

These organs are most directly affected due to oestrogen and progesterone deficiency. The ovary, uterus, vulva and vagina are involved leading to vaginal dryness (due to lack of secretion from Bartholin's gland ), dyspareunia due to vaginal dryness or atrophy, depression and other psychological changes; post menopausal bleeding from atrophic vaginitis or atrophic endometrium. There may be vaginal or uterine prolapse. Lower urinary tract and the genital tract have a common embryological origin, so like genital tract it is also affected. Patients present with incontinence of urine, frequency, urgency and pain on micturition, and difficulty in voiding ,which may be due to detrusor under activity , urethral over activity, or mechanical obstruction. Breast tissue is hormone dependent. Four hormones i.e. oestrogen (helps in duct development of breast), progesterone (helps in development of glands and lobes), prolactin, growth hormone. Glandular tissue constitute about 30% of the breast of premenopausal non lactating women but only 5% in postmenopausal women. In advanced age involution is not uniform, persistent lobules may be associated with risk of breast cancer.

(3) **Skin, hair, and body fat:-**

There are oestrogen receptors in the superficial layers of the skin, in the hair follicles and sebaceous or sweat glands. Collagen is the major constituent of the skin. It is responsible for maintaining the elasticity and texture of the skin. Skin collagen is lost at a faster rate during the immediate post menopausal years. Deficiency of oestrogen causes loss of collagen and results in thinning, dryness and wrinkling of the skin. The woman complains of itching and a feeling of ants crawling all over.

(4) **Bone and the skeleton:-**

Osteoporosis is a long term result of oestrogen deficiency. Post menopausal osteoporosis predisposes to fractures, particularly the hip, colle's fracture, vertebrae, upper femur, fractures of ribs. Osteoporosis of the spine causes collapse of the vertebrae and a deformity of the spine may result. Osteoarthritis and spondylosis are common.

(5) **Gastro intestinal:-**

Disturbed appetite, various form of dyspepsia, intestinal obstruction, Constipation are common gastrointestinal complaints.

(6) **Cardiovascular, cholesterol and lipid metabolism:-** Prior to menopause, women enjoy a Significant advantage over men with regard to risk of heart attacks. After menopause, the protective effect of oestrogen on blood vessels is lost. There is increased total cholesterol and LDL, and fall in HDL and HDL/ total cholesterol ratio. So, there are increased chances of coronary heart disease (Heart attack), cerebrovascular accident (Brain stroke) and Hypertension.

(7) **Pelvic floor:-** Weakness in the pelvic floor and ligamentary supports of the uterus can cause prolapse<sup>(4)</sup>

**Clinical features of menopause according to Ayurveda:-** As mentioned earlier menopause is known rajanivritti in Ayurveda. All the symptoms can be divided into

- (a) Doshaja Symptoms
- (b) Dhatu Kshayaja Symptoms
- (c) Manasika Symptoms

**Doshaja Symptomts/lakshan:-**

(I) **Vataja:-** Shirah shool, Hrid spandanadhikya, Hastpada supti, Shabda asahisnuta, Bala kshya, Adhmana, Atopa, Vibandha, Anidra, Bhrama, Katishool, Sandhivedana (Headache, palpitation, numbness of hands and feet, intolerable of sound, reduced strength, GI gas- syndrome, constipation, insomnia, vertigo, backache, joint pain).

(ii) **Pittaja:-** Ushnanubhuti, Daha, Swedadhikya, Ratriweda, Trisha, Mutradaha, Glani, Yonidaha (Hot flush, burning sensation, excessive sweating, night sweat, thirst, burning sensation of urine, loss of cheerfulness, vaginal burning).

(iii) **Kaphaja:-** Hrid dravata, Bhrama, Rukshya, Angamarda (Palpitation, vertigo, dryness, and bodyache). Probable pathogenesis behind various "vataj lakshana" includes vatavridhi avastha, jaravastha, generalised raukshya, shosa and kshya causes vata vridhi.

**Generalised Dhatukshyaja Lakshan / symptoms:**

- **Rasakshya** Sabda asahatva, Hridravata, Shula, Shrama, shosa, Trishna (Intolerance of sounds, Shula, shrama, shosa, Trishna)
- **Raktakshya** Twaka rukshata, sira shaithilya (Dry skin, atonia vessels)
- **Mamsa kshya** Sphik gandadi shuskata, rukshata, Sandhisphutanata, sandhi vedana, Dhamani Kathinnaya (Muscle wasting in gluteal region and face, dryness, joint pain, atherosclerosis )

- **Meda kshya** Anga rukshyata, shrama, shosa, (Vaginal dryness, fatigue, wasting);
- **Asthi Asthi toda, Danta, nakha, rukshata, sandhi vedana**
- **Majja kshya** Asthi saushirya, Asthi toda Daurbalaya, Bhrama
- **Shukra kshya** Yoni vedana, shrama, daurbalaya, panduta (Dyspareunia, fatigue, weakness, anaemia).

**Manasika Lakshana:-**

Krodha, shoka, visada, chinta etc. (Increased irritability, grief, depression, Anxiety).

**Diagnosis of Menopausal Syndrome:-** Ayurvedic diagnosis is based on clinical diagnosis and is dual Approach, i.e. patient centred and disease centred. Golden thread of Ayurvedic diagnosis comprises of analysis of dosha, kala, Agni, vaya, bala. Diagnosis of menopause as per medical science is done on the basis of

- (a). Clinical criteria
- (b). Vaginal cytology,
- (c). Hormonal assessment
- (d). Progestin challenge test.

**Osteoporosis / Asthi kshaya:-** It is a progressive systemic disorder characterised by low bone mass, Micro-architectural deterioration of bone tissue, increase in bone fragility and susceptibility to fracture. Genetic factors, nutritional status, physical activity, and gonadal status are the determinants of peak bone mass . According to Ayurveda Asthi dhatu is concerned with the function of sharira dharana. In Asthi kshya there is diminution of Asthi dhatu (Bone tissue). The signs and symptoms of Asthi kshaya i.e., Asthi sandhi shoola, kasha, roma, danta, vikara and daurbalya are exactly the same with the osteopenia/ osteoporosis. Aharaja (dietary), viharaja (life style), manasika (mental) are the causes of Asthikshaya. Sushruta says that the Anna Rasa (nourishment/plasma) can not nourish the old aged persons due to senile degeneration. It is said in Ayurvedic classics that deep tissue seated disorders are Yapyya in the initial stage and become pratyakhyeya in the late stages, as the condition worsens.

**Osteoarthritis / Sandhigata vata** Most common of all joint diseases especially occurring in the elderly and presents without systemic manifestations. A degenerative joint condition with loss of articular cartilage leading to pain, mobility limitations, and deformity. Weight

bearing joints such as spine, hip, and knee are commonly involved. In Ayurveda, it is called Sandhi gata vata. It is purely a vatic disorder, and mainly found in vatic age or old age. When abnormal vayu localises to joints gives rise to impairment of joint functions and produce *Hanti sandhi, shool, sophā*, in the joint. Snehana, sevadana, guggulu compound, and Rasayana are the line of treatment of sandhi gata vata.

**Diabetes / Madhumeha:-** Diabetes Mellitus is a syndrome characterised by chronic hyperglycaemia and disturbance of carbohydrate, fat, and protein metabolism associated with absolute or relative deficiency in insulin secretion and or / insulin action. Insulin allows glucose (sugar) to enter body cells to convert into energy. Insulin is also needed to synthesize protein and store fats. In uncontrolled diabetes, glucose and lipids (fats) remain in the blood stream and with time damage the body's vital organs and contribute to heart disease. Historically speaking madhumeha is known from vedic times. It comes under vatic *Prameha*. The disease Madhumeha is called mahavyadhi (Difficult to cure or incurable). Aetiology of *Medoroga* is applicable to *Madhumeha* (Ch. Su. 21/4). Excessive intake of *guru, madhura, sheeta, snigdha*, sedentary habits; absence of mental work, genetic defect (*Bijadosha swabhava*) are the etiological factors. Madhumeha is produced due to *Dhatu Agni - Mandya* (Metabolism).

**Psychological disorders/ Manas rogas :-** More elderly women than men are prone to develop Psychological problems. Complex interplay of biologic, sociologic and psychological factors causes different mental problems. Depression, Dementia, Anxiety, Adjustment disorders, Substance abuse, and Delusion disorders are common in the elderly. In old age stress level is high due to physical, mental, emotional, and socioeconomic stressors. Common mental problems in the elderly can be expressed by 4'D's i.e. Depression, Delirium, Delusion and Dementia. In Ayurveda, *Visada, Cinta a Udvega*, various forms of *Santras* (phobias), *Attavabhinivesa* and *Smriti Bhramsa* (dementia) are common in the elderly.

**Management:** It can be divided under three headings (a) *General* (b) *Special* (c) *Mental*.

(a) **General management:-** As per medical science, some principles are helpful to keep in mind while caring for older adults

- i) Diseases often present atypically,
- ii) Many disorders are multifactorial in origin,
- iii) Not all abnormalities require evaluation and
- iv) Polypharmacy and adverse drug events are common problems.

According to ayurveda treatment is of two types. One is related with preservation and promotion of health of healthy person known as *Urjaskara chikitsa* (Urja= infuses energy in tired and aged persons) and thesecond one concerned with treatment of diseases termed as *Roga-nut Chikitsa* (Roga=disease, Nut= cure). Swasthavritta( Daily and seasonal regimen and way of life), Rasayana (rejuvenation of body, mind, and brain & Immunomodulation), Vajikarana (Eugenics and sexual health) and Yoga come under Urjaskara chikitsa. For treatment of patients three types of basic therapy are employed i.e. Daiva vyapashrya (spiritual treatment), Sattvajaya (control of mind), and Yukti vyapashrya chikitsa (rational treatment). The last type of treatment is mainly in practice now a days. It is again done by internal medication (Bio-purification & pacification by drugs), external application of drugs and surgical measures.

- (b) **Special:** It refers to management of the menopause and climacteric problems in women.
- i) **As per medical science** it comprises of assessment of initial assessment and counselling, appropriate screening test (osteoporosis, dyslipidemia, genital tract carcinoma, prolapsed). Hormone Replacement Therapy (HRT), Tranquillisers, and sedatives, calcium and vitamin D associated with periodic review.
  - ii) **As per Ayurveda** This may be classified into preventive and promotive & curative.

**Preventive and Promotive:** Preventive strategies are the backbone of Ayurveda. Menopause may be silent or may be loud. *Rajswala paricharya* (Regimen for menstruating like observe celibacy, avoid day sleep, Positive state of mind, avoid meal made of ghee, milk & rice, avoid hot, pungent, salt food, less quantity of meal, avoid abhyanga and other panchakarma. These things reflect the social culture of that time. *Garbhini paricharya* (total health care of a woman during pregnancy/Antenatal care, month wise regimen includes for the first months, predominantly sweet, cold, and liquid diet; In the sixth month, butter or rice gruel medicated with goksura should be taken, In the seventh month, ghee medicated with vidragangandhadi drugs for proper development of the fetus. In the eighth and ninth month, anuvasana vasti (oil enema) which will help in the downward movement of vayu for easy vaginal delivery and without complications). *Sutika paricharya* (Care during

puerperal period), it includes wearing gems, Application of Bala taila / Dhanvantara tailam, bath with herbal decoction, and some medicines like kala jiraka, some galactogogues like satavari and Vidarikanda). In *praudha and vriddha vastha* (After the age of 40 and onwards improve natural defense, satvavajaya i.e. by education, counselling, encouragement, and reassurance that the end of menstruation is not the end of life but the beginning of a new phase to be lived and enjoyed, changing food habit- use of soya, atasi, germinated moong, phytoestrogen containing substances, Regular exercise, Yoga for total personality development at the physical, mental, social and spiritual levels, more useful for psycho-spiritual problems, Rasayana specially Satavari and Aswagandha and Suryanamaskar, adequate rest and sleep ). The loud menopause can be treated on the basis of managing Dhatuksheenata and agni mandya.

(c) **Psychiatry/mental:** Psychological care is utmost important because it will help in strengthening the mind and improve mental quality of life.

i) **Medhya Rasayana** the drugs or formulations that enhance intellectual faculties or brain rejuvenators e.g. Centella asiatica(manduka parni), Bacopa monnieri (Bramhi), Acorus calamus (vacha)

ii) **Satvavajaya** cognitive behavioural therapy,

iii). **Achar rasayana** (Achara= good conduct, Rasayana = Rejuvenation), it is nothing but moral teaching. Good conduct help us to have a long and disease free life.

iv). **Meditation / Dhayana-** In the West, meditation means a concentrated state of mind . In the East meditation is fixing mind in a spiritual ideal. Hindu meditation is a repetition of mantra with feeling of spiritual oneness.

(v). **Ayurvedic physician** can also play the role of a family physician in psychological care.<sup>(5)</sup>

**Conclusion:-** Woman plays the role of an adorable daughter, a caring sister, a loving wife, an affectionate mother and not to forget a sweet grandma. Actually motherhood is based upon a delicate balance in the Hypothalamus Pituitary Ovarian and Uterine axis. Three types of approaches are needed for the management of health problems in ladies after 60 years, general care related to different medical and surgical conditions, special care concerned with menopausal symptoms and mental care related to treatment of depression, anxiety, dementia. Ayurveda is knowledge of natural harmony and a method of removing disharmony. Natural products specially fruits, vegetables and whole grain contain different plant chemicals that keep our cell chemistry stable. In place of synthetic molecules (HRT) these may be safely administered in this phase of life.

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# BHRAMARI PRANAYAMA: ITS EFFECT ON PHYSICAL AND MENTAL HEALTH

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## Introduction

Health status is a good indicator of development of a country. Attainment of highest level of health to enjoy the life is the right of an individual. It is the responsibility of the country to maintain its level of health. There are many factors responsible for poor status of health like poverty, illiteracy, low socio economic status, stress etc. Different strategies have been made by Government of India to combat such type of problems. But with changing scenario the changes in health issues has also been seen. Now the arising problems are due to unhealthy life style. Diabetes Mellitus, Hypertension, Obesity, Osteoarthritis, Dysmenorrhoea, PCOD etc. are life style related disorders. To combat such type of problems yoga is a good approach. Yama, Niyama, Asana, Pranayama, Pratyahara, Dharna, Dhyana, Smadhi are the eight angas of ashtanga yoga. Each anga has its own importance. The ultimate aim of following ashtanga yoga is to get Moksha. But now a days general public is adopting yoga for treatment. Pranayama is a stage of Ashtanga yoga which is most commonly advised to treat different ailment. The Word Pranayama is made up of two words prana & ayama. Prana means vital energy or life force ayama is defined as extension and expansion. Thus the word pranayama means extension or expansion of the dimension of pranas. The technique of the pranayama elucidates the method whereby the life force can be activated and regulated in order to go beyond one's normal boundaries or limitations and attain a higher state of vibratory energy and awareness. The breath is the most vital process of the body. It influences the activities of each and every cell and most importantly is linked with the function of the brain. Most of the people breathe incorrectly, use only small part of their lung's capacity. Breathing is generally shallow, depriving the body of oxygen which is essential to maintain good health. Irregular breathing disrupts the rhythm of the brain and leads to physical emotional and mental blocks, these in turn lead to inner conflict, a disordered lifestyle and disease. Pranayama establishes a regular breathing patterns, breaking this negative cycle and reverses the debilitating process. It acts by giving us a control on breath and re-establishing the natural, relaxed rhythms of the body and mind. Bhramari Pranayama is very good technique for relaxation of body and mind.

## Bhramari Pranayama

The word 'Bhramari' refers to the humming sound made by a 'bhramara'. *Bhramari Pranayama* consists in making a deep, soft humming bee-like sound while exhaling. Because *Bhramari Pranayama* has a very calming effect on the nerves and the mind, it is usually practised as a prelude to meditation. As a part of the *pranayama* routine, it should be practised at the end of other *pranayama* practices. *Bhramari Pranayama* is also practised as a part of the yoga tradition called Nada Yoga (yoga of sound). As the name implies, *Nada Yoga* uses the element of sound, both external and internal, to reach higher levels of consciousness. In the subtle stage of *Nada Yoga*, one listens to internal sounds allowing the perceived sound to arise spontaneously. *Bhramari Pranayama* is used as a preliminary stage of the practice of *Nada Yoga*.

## Shanmukhi mudra

*Bhramari Pranayama* is practised while applying the *Shanmukhi Mudra*. The word 'shanmukhi' is composed of two Sanskrit words 'shat' (six) and 'mukhi' (mouths or gates). So the full name means the 'six-gated mudra'. The six gates refer to the two eyes, two ears, nose and the mouth. The purpose of the *Shanmukhi Mudra* is to symbolically shut the mind from the five senses so the mind can maintain an inward focus in the state of *pratyahara* (sense withdrawal) and get ready for meditation. To shut the senses, the thumbs are used to plug the ears, the index fingers are placed on the eyelids, the middle fingers on the two nostrils, the ring fingers above the upper lip and the little fingers under the lower lip. A light pressure is applied with the thumbs and fingers.

अर्धरात्रे गते योगी जन्तूनां शब्दवर्जिते ।  
कर्णोविधाय हस्ताभ्यां कुर्यात् पूरक कूम्भकम् ।  
शृणुयादक्षिणे कर्णे नादमन्तर्गतं शुभम् ।  
प्रथमं शिंशीनादं च वंशीनादं ततः परम् ॥  
तुरी भेरीमृदङ्गादिनिनादानकदुन्दुभिः ।  
एवं नानाविधो नादो जायते निम्समभ्यासात् ॥  
अनाहतस्य शब्दस्य तस्य शब्दस्य यो ध्वनिः ।  
ध्वनेरन्तर्गतं ज्योति ज्योतिरन्तर्गतं मनः ॥  
तन्मनो विलयं याति तद्विष्णोपरम पदम् ।  
एवं च भ्रामरी सिद्धिः समाधिसिद्धिमाप्नुयात् ॥  
जपादष्टगुणं ध्यानं ध्यानादष्टगुणं तपः ।  
तपसो दष्टगुणं गानं गानात्परतरं नहि ॥

(घे. स. पंचमोपदेश 77-82)

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According to Gheranda Samhita, at midnight when there is complete absence of external sound the yogi close his ear with hands and proceeds for *puraka and kumbhaka*. At that time with the right ear, hears his internal *Naad*. Firstly he perceives sound of zinger and after that *vansi naad*. After that *Maghanaad* than *Zarzar naad*, continuously *Bhramari naad*, *Ghata naad*, again *turai*, *bheri mridhang* and *Nagada naad* respectively. In this way, different types of *naad* heard by regular repetition. This *naad* is heard uninterrupted. That sound and *mana* have same *gyoti* when conjugate with the supreme Lord Vishnu.

### Technique for Bhramari Pranayama

- Sit straight in a comfortable meditative posture.
- Keep the spine, neck and head in straight line
- Softly close the eyes and relax the face
- Breathe in and out from nose
- Follow the breath till it becomes natural and comfortable
- Raise arms and using index fingers close the ears
- Inhale deeply from the nose
- Partially close your glottis as you inhale through both nostrils, making a snoring sound
- Exhale making a deep soft, low pitched humming sound from the nose
- Focus awareness on the sound
- Remember not to make sound when the exhalation is about to get over
- Breathe in a relaxed and comfortable manner
- Repeat the process ten times
- Keep ears and eyes closed for some time after ten rounds are complete
- Slowly lower the arms and gently open the eyes

### Time to do Bhramari pranayama

- The best time to perform the *Bhramari pranayama* is either in the morning or evening but always on an empty stomach.
- If you practise it in the morning it should be done after brushing and emptying out the bowels.
- If it is to be done in the evening, there should be a gap of at least 3-5 hours after lunch.

### Number of rounds

- The *Bhramari pranayama* should be initially done 10-12 times and then gradually increased to 25-30 repetitions. It should be performed continuously for at least 5 minutes

### Benefits of Bhramari pranayama

- *Bhramari* causes the whole brain to vibrate. Vibration of the cerebral cortex sends impulses to the hypothalamus which has the capacity to control the pituitary gland. The hypothalamus also sends impulses to the sympathetic and parasympathetic nervous systems.
- This helps tune the whole neuro endocrinal system to

function in a harmonious and synchronized way.

- Paroxysmal Gamma waves are produced in brain during the *Bhramari Pranayama* (Vialatte et al., 2009) which is associated with positive thoughts, feelings of happiness and acts as a natural antidepressant.
- In *Bhramari Pranayama*, pressing of the eyeballs leads to stimulation of the vagus nerve which in turn leads to activation of the parasympathetic nervous system (PNS). PNS is associated with a relaxed and calm state of mind and body (Speciale and Stahlbrodt, 1999; Zabara, 1992). Under the relaxing effects of PNS, autonomic nervous system facilitates to decrease the stressing effects of sympathetic nervous system and channels it towards more relaxed PNS.
- It calms the nervous system and brings in a mental state of calm and peace
- It helps in conditions of mental tension, high blood pressure, anxiety and heart related problems. It helps to induce a calming effect on the mind.
- Practicing *Bhramari pranayama* benefits in reducing high blood pressure, fatigue, and mental stress.
- *Bhramari pranayama* is also useful in curing migraines.
- Bumble bee breathing (*Bhramari*) this rhythmic breath creates a chant like cranial vibration that stimulates the limbic system, which contains the thalamus, the emotional brain. This thalamic activity reduces worry and stress leading to feelings of pleasure.
- “*Bhramari* works well for people with obsessive-compulsive disorder and anxiety,” says Weintraub. “Creating a vibration in the skull leaves no room for negative spiraling thoughts and that calms the mind.”
- If this *pranayama* is performed during the period of pregnancy, it can help maintain and regulate the functioning of the endocrine system and provide trouble-free and easy child birth.
- *Bhramari pranayama* is extremely beneficial to heart patients as it helps maintain overall working of the cardiovascular system.
- *Bhramari* breathing exercises should be performed regularly for controlling respiratory disorders, asthma and thyroid problems.
- It enhances natural healing process of the body
- It improves quality of sleep

**Conclusion:** *Bhramari pranayama* is good exercise to maintain the physical and mental health. Hurry, worry and *curry* are three important factors having negative effect on health. These three conditions are the result of stresses of surrounding environment created by us and leads to many disorders like anxiety, depression, disturbed sleep, indigestion, acid peptic ulcer disease etc. Yoga is the only branch which has the capability to deal with such type of problems. So one should do *Bhramari pranayama* to attain positive health.

# AYURGENOMICS : A COLLABORATIVE APPROACH TO PREVENTIVE AND PERSONALIZED MEDICINE

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## Introduction

A significant paradigm shift is taking place in the world of medicine as the focus is moving away from the reactionary approach i.e. drug therapy/surgery to proactive and preventive approach to complicated health problems because conventional medicine is of late recognizing its inability to prevent or to address the cause of complicated diseases. Although conventional medicine has prevailed over many of the diseases that have plagued humanity throughout the ages such as communicable diseases but the diseases of greater complexity such as thyroid dysfunction, diabetes, alzheimer's, heart diseases etc. which are not caused by a single factor but by a combination of genetic and environmental factors tend to be chronic and place the heaviest burden on healthcare system all over the world. Personalized medicine is the new approach representing this shift towards health and prevention. It emphasizes the tailoring of health oriented protocols to the individual characteristics of each person to optimize preventive guidelines and therapeutic approaches. Personalized medicine can be defined as medical care for each patient's unique condition and origin of this theory dates back to 1500 B.C. *Ayurveda*. The traditional system of Indian medicine and other traditional systems of medicine have well defined systems of constitutional types used in prescribing medicine bearing resemblance to personalized medicine. Father of western medicine, Hippocrates was also known to advocate personalized medicine. He evaluated factors like person's constitution, age and physique in decision making when prescribing drugs. Upon the discovery and elucidation of the molecular basis of hereditary diseases beginning in the early 20th century, modern version of an ancient tradition is being revived.

## Personalized medicine through genomic study

The recent completion of the human genome sequence has shifted research efforts in genomics towards function of human genome, its regulation, and how sequence variation contributes to disease and varied response to therapy. Each of us carry genome inherited from our parents and the inherited differences in DNA sequence contribute to phenotypic variation influencing an individual's anthropometric characteristics, risk of diseases and response to environment. The recognition of these inter-individual differentiations that brings

variation in drug response is an essential step towards personalized medicine. According to Modern Science, humans are 99.9% identical. The genetic variation due to single nucleotide polymorphism (SNP) is the most common between different human beings. The phenotypic differences arise due to SNP and it contributes 0.1% of the differences. There are 3 billion nitrogen bases and 30000 genes in human chromosomes. Fifty percent of the human genome has repetitive sequence and 1.42 million SNPs are distributed throughout human genome, an estimated 1 SNP per 1000 base pair. The complete mapping of these genetic polymorphisms that influence drug response forms the basis of personalized medicine and these differences could be helpful in the understanding of adverse drug reactions (ADRs). Efforts are being directed towards identifying SNPs in genome wide analysis that predispose humans to common chronic diseases such as obesity, cardiovascular disorders, diabetes, and to identify successful markers. Apart from inherited genetic variations (most commonly SNPs), variation in drug response is influenced by changes in gene function that occur without a change in the nuclear DNA sequence. The study of such changes is done under an emerging field of Epigenetics, which is drawing attention of scientists across the globe. The major underlying mechanisms of such changes are RNA inactivation, histone modifications and DNA methylation. Unlike DNA mutations, epigenetic variations are potentially reversible. Therefore, one of the long term goals of epigenomics is to map the DNA methylation patterns in various diseases to find out epigenetic markers of common chronic diseases, variation in drug response and simplify the path to personalized therapy. The future of epigenomics therapy holds tremendous potential for not only individualized health care but also for population-wide disease screening and prevention strategies. Pharmacogenomics is the application of genomic technologies to study drug discovery, therapeutic response and pharmacological functions with the aid of genomic technologies such as Polymerase chain reaction (PCR), Restriction Fragment Length Polymorphism (RFLP), DNA microarray and bioinformatics to find out genetic basis of inter-individual and inter-racial variation in drug response. Pharmacogenomics and Epigenetics are the foundation stones to personalized healthcare. If personalized medicine is to be realized, a

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systematic classification of human population is necessary but modern medicine classifies human population based only on ethnicity. Geographic patterns of genetic variation show that inter-individual variation in drug response is common. This gap could be effectively filled by *Ayurveda* and its vision as ayurvedic classification is independent of racial, ethnic, or geographical considerations and may provide appropriate means of classifying phenotypes to be considered collectively for genotyping. What is required is a connection of phenotypic features (*Prakriti*) with genotype as personalized medicine aims to design drugs with maximum efficiency and safety for a particular disorder. Ayurvedic system of medicine and other traditional systems of medicine have a personalized approach in treating a patient with centuries of practice. Their intervention and assistance in personalized treatment has now become a necessity.

### Prakriti

One of the basic tenets of *Ayurveda* is that man is a microcosm of the very world that he inhabits. This implies explicitly that whatever man is made up of, the world too is made up of those same things or elements, but of different combinations and degrees. Here, by elements is meant the five *Mahabhutas* that is, *Akasa*, *Vayu*, *Agni*, *Jal* and *Prithvi*. The earth and man are made up of these five elements. In fact, *Ayurveda* postulates that all living beings on the earth, including the non-living too, are made up of these same five elements in varying degrees, specific to each form, matter and species, and according to a predetermined ratio that cannot be changed. These five elements combine with each other to form the tridoshas viz. *Vata*, *Pitta* and *Kapha*. If changes do occur, then this leads to an imbalance in the organism, or a modified version of the organism is formed, the survival of which will depend upon its ability to adapt to its environment. "In *Ayurveda*, the three *Doshas* are considered to be universal principles that function in all aspects of material creation, including the mineral, plant and animal kingdoms, the time of day, the seasons of the year, even the planets and galaxies. In this way, the human physiology is inexorably connected to the whole of existence. *Prakriti* is a consequence of the relative proportion of these three entities (*Tri-Doshas*), *Vata* (V), *Pitta* (P) and *Kapha*(K), which are not only genetically determined (*Shukra Shonita*), but also influenced by environment (*Mahabhuta Vikara*), especially maternal diet and lifestyle (*Matur Ahara Vihara*), and age of the transmitting parents (*Kala - Garbhashaya*). Hence *Prakriti* can be considered as qualitative and quantitative unchangeable *doshika* predominance from birth to death. The ethnicity, familial characteristics as well as place of origin of an individual are also described to influence

development of *Prakriti* besides the aforementioned individual specific factors. The *Prakriti* of an individual is fixed at the time of birth and remains invariant throughout the lifetime. In an individual, the tri-doshas work in conjunction and maintain homeostasis throughout the lifetime starting from fertilization. Distinct properties and functions have been ascribed to each *Dosha*. The kinetic components of a system have been ascribed to *Vata*, the metabolic components to *Pitta* and the structural and stability components to *Kapha*. For instance, *Vata* contributes to manifestation of shape, cell division, signaling, movement, excretion of wastes, cognition and also regulates the activities of *Kapha* and *Pitta*. *Kapha* is responsible for growth and maintenance of structure, storage and stability. *Pitta* is primarily responsible for metabolism, thermo-regulation, energy homeostasis, pigmentation, vision, and host surveillance. Hence the differences in *Tridoshic* proportions right from the time of fertilization are manifested as different phenotypes that can vary with respect to external appearances, body physiology, and response to external environment etc. Thus a continuum of relative proportions of doshas results in seven possible constitutional types namely *Vata*, *Pitta*, *Kapha*, *Vata-Pitta*, *Pitta-Kapha*, *Vata-Kapha* and *Vata-Pitta-Kapha*. Amongst these, the first three are considered as extremes, exhibiting readily recognizable phenotypes that are evident not only at the anatomical and physiological level but also at the level of mental aptitude. However, the individuals of such predominant *Vata*, *Pitta*, *Kapha* *Prakriti* are relatively infrequent in the population. At the anatomical level these constitution types differ with respect to body frame and built, skin, eye and hair colour, texture and composition; at the physiological level the differences are exhibited with respect to food and bowel habits, tendency to gain weight, disease resistance and healing capacity, tolerance for specific weather, metabolism of toxic compounds etc. Besides these constitution types have specific likes, dislikes and suitability of tastes and there are differences in memory retention as well as aptitude differences. The constitution type and *Prakriti* levels of dosha are considered as normal for that individual. Any perturbation from an individual's homeostatic state of doshas (*prakriti*) leads to diseases (*vikriti*). Elevation of *Vata*, *Pitta* & *Kapha* beyond an individual's threshold leads to manifestation of specific doshic disorders. Amongst the *Vatic* disorders developmental, neurological, dementia, movement and speech disorders, arrhythmias etc are described. In *Pitta* elevation, ulcer, bleeding disorders, skin diseases etc. and in *Kapha* obesity, diabetes, atherosclerotic conditions etc. are described. The perturbation of specific doshas in an individual is assessed through the symptoms and the aim of Ayurvedic physicians is to measure the amount of perturbation and bring back the

doshas to his or her homeostatic state by appropriate dietary and therapeutic regime. Each of the food or medicine including lifestyle related things have been described to enhance or reduce a particular doshic state and therefore an individual specific customized treatment is provided. Thus the beauty of Ayurveda lies in the fact that an individual, a disease condition, drug, diet as well as environment is described in terms of doshic components and appropriate customizations can be provided to balance these states.

### **Ayurgenomics**

A new approach is being developed at the Institute of Genomic and Integrative Biology to collaborate the ancient knowledge with the modern scientific advancements. This new approach called 'Ayurgenomics' is the integration of the principles of Ayurveda with genomics. The primary challenge of Ayurgenomics is to establish the correlation between DNA and '*Prakriti*'. The basis of individual variations in Ayurveda indicates that individuals with *Pitta Prakriti* are fast metabolizers while those of *Kapha Prakriti* are slow metabolizers. Different *prakriti* may have different drug metabolism rates associated with drug metabolizing enzyme (DME) polymorphism as well. A correlation between CYP2C19 enzymes involved in metabolism of a number of drugs genotypes and *prakriti* has been studied. Therefore Ayurgenomics seems to bear similarities with pharmaco-

genetics and has the potential to be a platform to achieve personalized drug therapy. The understanding of "SNP science" leads to the concept of personalized medicine which goes parallel with the concept of "*Prakriti* based medicine (Ayurgenomics)."

### **Conclusion**

From the foregoing description it is evident that Ayurveda has a personalized approach in predictive, preventive and curative aspects of medicine. It deals with inter-individual variability in assessing susceptibility, establishing diagnosis, and prognosis mainly on the basis of constitution type of the individual ("*Prakriti*"). Selection of a suitable dietary, therapeutic and life style regime is made on the basis of clinical assessment of the individual keeping one's *Prakriti* in mind. This is in contrast with modern medicine wherein assessing susceptibility might be based on genetic markers, diagnosis based on objective parameters, dietary and life style recommendation are disease based and treatment is mostly symptomatic with the dosage management mostly empirical. Though many sophisticated methods available, there is minimal cross-talk among any of these steps mentioned above. But for application of *prakriti* in predictive medicine, it is imperative to establish the molecular basis of this ancient and documented system of constitution types described in Ayurveda.

# THE SCIENTIFIC CONCEPT OF DIETETICS OF AYURVEDA

\* Dr. Anita Sharma

## Introduction

The history of dietetics is very old. Diet is an essential factor for the maintenance of life. Nature managed it before creation of living beings on the earth. A balanced diet is defined as one which contains a variety of foods in such quantities and proportions that the need for energy, amino acid, vitamins, minerals, fats, carbohydrate and other nutrients is adequately met for maintaining health, vitality and general well being and also makes a small provision for extra nutrients to withstand short durations of decreased nutrition. A balanced diet has become an accepted means to safeguard population from nutritional deficiencies. Acharya Charaka has emphasized diet as an essential pillar of healthy life. It is likely that no other science has described the unique effects of diet as thoroughly as Ayurveda described them thousand years ago. According to Charaka there are three pillars of life. One is Ahara or diet the second is Nidra that is sleep and the third is Brahmacharya i.e. celibacy. If any of these pillars is weak, life also becomes unhealthy. Acharya Charaka used term Pathya for healthy or balanced diet. Pathya means that which is wholesome or correct, Apathya means unhealthy or incorrect diet.

## The Wholesome Diet and Unwholesome Diet

It has been described by Charaka in terms of Hitaahara i.e. wholesome diet and Ahita i.e. unwholesome diet. Lord Atreya has stated these terms as "The food which maintains the balance of dhatus as normal and restores the equilibrium in the imbalanced ones, should be taken as whole some otherwise unwholesome.

Only the use of wholesome food promotes the growth of person and that of unwholesome one is the cause of diseases. The relation of wholesome diet and health and unwholesome diet and diseases was known to Charaka. As we know that the food we eat definitely affect the doshas, so here we discuss modern food items which aggravate or pacify the doshas:-

**Vata aggravating food:-** Raw vegetables, salads, white flour, sugar will vitiate the vata dosha. Vegetables like cabbage, cauliflower, brinjal, leafy green vegetables, mushrooms, peas, capsicum, potatoes, sprouts, tomatoes etc. also aggravate vata. Fruits like apple, pear, pomegranates should not be taken by vata vikara patients.

**Vata pacifying food:-** To balance vata food and drinks should be warm madhur (sweet), Amla (sour), Lavana (salty). Cereals like oats, wheat, rice, cow milk, cow butter and all oils specially sesame oil should be taken. Vegetables such as green gourd, round gourd, bitter melon, ginger cabbage, spinach, carrot, green fenugreek, green chilly, sprouted beans, green chilly, beets and spices like black pepper, cinnamon, cardamom, cumin, ginger, salt, clove etc should be included in the diet. Sweet fruits like grapes, cherries, peaches, melons, bananas, coconut, apricots, ripened apples, papaya, guava etc pacify the vata dosha.

**Pitta aggravating food:-** Deep fried, oily and spicy eatables should be strictly avoided. Yogurt, cheese, sour cream, almonds and sesame oils; corn, rye, brown rice; sour fruits, plums, olives; radish, tomatoes, beets, brinjal, green and red chillies, onion, garlic, spinach; cashews, sesame seeds, peanuts etc should be avoided.

**Pitta pacifying food:-** To balance Pitta, food and drinks should be cool, Madhura (sweet), Tikta (bitter) and Kashaya (astringent). Barley, oats, white rice, wheat, butter, cheese, ghee, cold diluted milk, Oils like olive and sunflower, sweet fruits, apples, coconut, figs, mango, melons, pears, sweet and bitter vegetables, broccoli, sprouts, cabbage, cauliflower, green beans, leafy greens, peas, potatoes are pitta pacifying food items. Eat all vegetables in boiled form avoid frying them. Coconut water is also good for pacifying the pitta. Spices- coriander, cinnamon, cardamom, fennel, turmeric, Black pepper, all spices should take in low amount.

**Kapha aggravating food:-** Foods which are cold, sweet, sour and salty will aggravate the kapha dosha. Wheat, rice or oats; Cheese, yogurt, buttermilk, cream, butter, ice cream, cold drinks Sweet fruits, grapes, bananas, coconut, figs, pineapple, watermelon, mango, potato etc are kapha aggravating foods.

**Kapha pacifying food:-** To balancing Kapha food and drinks should be warm, bitter and astringent. Cereals like barley, corn, millet, buckwheat, rye, low fat milk, honey. Oils of almond, corn or sunflower in small amounts. Fruits apples, pears, pomegranates, Vegetables Radish, green leafy vegetables, broccoli, cabbage, carrots, cauliflower, pumpkin, lettuce, sprouts

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Spice turmeric and dry-ginger (sunthi) or dry fruits like dates, big resins, dry dates.

### General Rules regarding Ahara (Diet)

General rules regarding how to take ahara, at what time etc. are described by Acharya Charaka in the first chapter of Vimansthan under the heading “Ahar vidhi vidhan”. One should eat warm food because it tastes well, the eaten food stimulates the digestive fire, gets digested quickly carminates flatus, reduces mucus. Hence one should eat warm food only.

One should eat Snigdha Ahara (unctuous), because it tastes well, eaten food stimulates the digestive fire, gets digested quickly carminates flatus, Develops the body, provides firmness to sense organs increases strength, produces clarity of complexion, Hence one should eat unctuous (Sigdha Ahara)

One should eat in proper quantity, food taken in proper quantity without disturbing vata, pitta and kapha only promotes life span.

One should eat when the previous meal is digested because if one eats during indigestion, the eaten food mixed with the product of the earlier meal vitiates all the doshas quickly.

One should take food which is Non-antagonistic in potency, while doing so one is not afflicted with the disorders caused by food antagonistic potency. (Virya Viruddha Ahara)

One should not eat quickly because by eating quickly the food may enter into wrong passage.

One should not eat too slowly because by eating too slow one doesn't get satisfaction.

One should eat with concentration, without talking and laughing much.

One should eat after due consideration, by following the above mentioned rules and following the rules never causes any harm to the body, other wise it may become unwholesome to the body which causes various diseases with virudha ahara combination.

### The eighteen factors responsible for dietetic incompatibility (virudhahara bheda)

Acharya Charak has described eighteen factors responsible for dietetic incompatibility and advised that they are not whole some for a person. The 18 types of virudhahara according to charaka :

- |              |             |
|--------------|-------------|
| 1. Desha     | 2. Kala     |
| 3. Agni      | 4. Matra    |
| 5. Satmya    | 6. Dosha    |
| 7. Samskara  | 8. Veerya   |
| 9. Kostha    | 10. Avastha |
| 11. Krama    | 12. Parihar |
| 13 .Upachara | 14. Samyog  |
| 15. Paka     | 16. Hridya  |
| 17. Sampad   | 18. Vidhi   |

The ancient Ayurvedic texts have described many types of in compatibilities along with their common examples, depending upon various attributes of food.

#### 1. Desha or Place

##### (Desha viruddha Habitat/ Place incompatibility)

Use of ruksha (Dry) and tikshana (Sharp) food items in Jangala Desha(Arid region) or consumption of snigdha (Demulscent) and sheeta (cold) food items in Anupa Desha (Marine or Marshy region) is considered as desha Viruddha (Habitat incompatibility).

#### 2. Kala viruddha

##### (Incompatibility according to time period).

Consumption of sheet (cold) and ruksha (Dry) food items in cold season and katu (Pungent) and ushna (Hot) food items in hot season is considered as Kala viruddha.

#### 3. Agni viruddha

##### (Digestive Power incompatibility)

Consuming the food items which are antagonistic to the four types of agni which prevail in the individuals. There are four types of digestive agni depending on its strength to digest the food items, consuming opposite to the nature of digestive agni is considered as agni incompatibility.

#### 4. Matra viruddha

##### (incompatibility in Amount/ Dose)

Consumption of madhu (honey) and ghritham (clarified butter) in same amount. Madhu (honey) and water in equal amount, two types of fatty substances in equal amount, water and sneha (fatty) items in equal amount, madhu (honey) and sneha (fatty) items in equal amount or madhu (Honey), sneha (fatty) substances and akasha jala (rainy water) in equal amount all are considered as examples of incompatibility in quantity of food items.

#### 5. Satmya viruddha

##### (Incompatibility at the level of Palatability/ Habit)

A person who has become satmya (palatable) of consuming katu (pungent) and ushna virya (hot potency) food items, prescribing madhur (sweet) and sheet virya (cold potency) food items.

#### 6. Dosha viruddha

##### (incompatibility at the physiological level/ humor incompatibility)

To consume the food items which are similar in properties to any one of the three i.e. vata, pitta and kapha dosha is considered as dosha viruddha.

**7. Samskara viruddha****(Incompatibility due to processing of food)**

Incompatibility may occur due to certain processing involved in food as for example roasting of meat of Peacock in the stick of eranda (castar). Few other examples are ghrith (clarified butter) which is kept more than ten days in the container made up of kansya (bronze), consumption of madhu (Honey) with items which are ushna (hot) in nature and in summer season.

**8. Veerya viruddha (Incompatibilities due to potency)**

Consumption of sheet virya (cold potency) food items in combination with ushna virya (hot Potency)

**9. Kostha viruddha (Incompatibility due to the nature of digestive system/ gut incompatibility)**

The person possessing krura kostha prescribed with medicine of less purgative action and Mridu kostha with guru (heavy) and tikshana (Sharp) purgative activity drugs result is Kostha Viruddha. Depending on the ease or difficulty with which the purgation occur the Individuals are classified as Mridu (soft) or Krura (hard) Kotha. Hence the person having Mridu Kostha should be given food items or drugs which are mild in nature and their purgative action, as in these persons purgation occurs quite easily, where as reverse is true for krura kostha individuals, ignoring the above regime causes incompatibility.

**10. Avastha viruddha (Incompatibility due to specific condition).**

The persons involved in excessive physical activities, excess coitus and exercise, if prescribed with a diet which increases vata and the ones who are lazy and sleep excessively given the food items which cause increase in kapha causes Avastha Viruddha.

**11. Krama viruddha (incompatibility due to order of in take of food)**

If a person consumes food without excreting all the wastes of food such as stool and urine, without feeling hungry or do not consume food even in excessive hunger that will results in incompatibility due to krama (order).

**12. Parihara viruddha (Incompatibility arising due to restraining from avoidable deeds/ prescriptions incompatibility)**

If a person consumes ushna virya (hot potency) food items after eating pork or heavy non vegetarian food then it causes incompatibility due to parihara.

**13. Upchara viruddha (Incompatibility due to food interaction with item taken with or after meal/ prescription incompatibility)**

Consumption of cold water after taking snigdha (Demulcent) food items like Ghrita (clarified butter).

The anupana is generally taken after consumption of particular foods. The Anupana helps in better digestion of food items and thus helps in easy assimilation. For snigdha or fatty food items the suggested anupana is hot water and hence consuming cold water is considered upachara viruddha.

**14. Samyoga viruddha (Incompatibility due to combination)**

Consuming amla (sour) taste food items along with milk, few other examples of incompatibility due to combination are

- Madhu (honey) with hot water.
- Krishra (Kichidi) and payas (rice cooked in milk) at one meal.

**15. Paka viruddha (Incompatibility due cooking)**

Cooking of food items with the wood that is infected or foul smelling, under cooking resulting in raw rice or excessive cooking or burning of the food is considered as incompatibility due of paka (cooking).

**16. Hridya viruddha (Incompatibility due to one's opposite inclination/ mental incompatibility)**

The food which is opposite to ones internal desire or inclination is considered as incompatible due to hridaya.

**17. Sampada viruddha (Incompatibility due to consumption of unripe food items/ ripeness incompatibility)**

Consuming the food items which are not fully ripe or not developed full rasa (taste), the one which is tasteless due to time factor or whose taste has changed are considered as sampada viruddha .

**18. Vidhi viruddha (Incompatibility due to improper eating conduct/ regulation incompatibility).**

If the food is not consumed in isolation or full mental presence or violating the other guidelines and rules for consumption of food then it causes incompatibility due to vidhi.

**INCOMPATIBLE COMBINATIONS OF FOOD PRODUCTS CURRENTLY POPULAR  
IN INDIAN SOCIETY**

<b>Sr. No.</b>	<b>Common foods</b>	<b>Incompatible with</b>	<b>Doshas predominance</b>
1	<b>Sweet fruits</b>	Acid fruits, starches. (Cereals, Bread, Potatoes) Proteins, Milk	Pitta , Kapha vitiation
2	<b>Acid Fruits</b>	Sweets (All kinds) Starches (cereals , Bread, potatoes) proteins (except nuts)	Kapha, Pitta vitiation
3	<b>Green vegetables</b>	Milk	Vata, rakta vitiation
4	<b>Starches</b>	All Proteins, All Acid Fruits, , Sugars	Vata, Pitta vitiation
5	<b>Meat (All kinds)</b>	Milk, Starches, Sweets, other proteins, Acid fruits and vegetables, butter cream, oils	Pitta , rakta , Kapha vitiation
6	<b>Nuts (Most varieties)</b>	Milk, Starches, Sweets, other proteins, butter cream, oils	Pitta , rakta vitiation
7	<b>Eggs</b>	Milk, Starches, Sweets other proteins, Acid food, butter cream, oils	Kapha vitiation
8	<b>Cheese</b>	Starches, Sweets, other proteins acids food, butter, cream, oils	Kapha vitiation
9	<b>Milk</b>	All proteins, Green vegetables starches	Kapha, pitta vitiation
10	<b>Fats and oils (butter, cream, oils)</b>	All proteins	Kapha, pitta vitiation
11	<b>Melons (All kinds)</b>	All foods	Vata, Kapha Vitiation
12	<b>Cereals (Grains)</b>	Acid fruits, All proteins, All sweets, Milk	Kapha, pitta vitiation
13	<b>Legumes, beans and peas (except green beans)</b>	All proteins, All sweets, milk, fruits (All kinds) butter, cream, oils	Kapha, pitta vitiation
14	<b>Mangoes</b>	Yoghurt, cheese, cucumber	Rakta, pitta vitiation
15	<b>Corn</b>	Dates, Raisins, Bananas	Kapha, pitta vitiation
16	<b>Yoghurt</b>	Milk, Sour Fruits, Melons, Hot drinks, Meat, Fish, Mangoe Starch, Cheese	Rakta, Vata, pitta vitiation
17	<b>Potato, Tomato, Chillies</b>	Yogurt, Milk, Melon, Cucumber	Vata, Pitta vitiation
18	<b>Radishes</b>	Milk, Bananas, Raisins	Rakta, Vata, pitta vitiation

**ROGAS (diseases) CAUSED BY VIRUDDAAHARA (ITEMS CURRENTLY POPULAR IN INDIAN SOCIETY)**

Sr. No.	Type of Viruddhara	Rogas (Diseases)
1	Milk + Banana	Causes skin diseases, sthulata (obesity), Madhumeha (diabetes) and Amavata (Rheumatoid arthritis) Causes skin diseases, swasa(asthma),
2	Milk + Chapati + Sabji (Stew)	Sthulata (obesity), Adhamana (Tympanitis), Sandhivata (osteoarthritis), Sira shoola, (Head ache) Chittodvega(anxiety)
3	Milk + Paratha Sabji (Stew)	Causes skin diseases
4	Milk + Sprouted grain	Causes skin diseases
5	Intake of milk after salad	Causes skin diseases, Pratisyaya (Rhinitis) Swasa, Amlapittam (Hyperacidity), Madhumeha, Sandhi Vata
6	Regular intake of paneer	Causes Grahani(Spru syndrome), Sandhi vata and chittodvega
7	Curd + Jaggery	Causes skin diseases, Amlapittam, Sandhi vata
8	Curd + Salad	Causes, Hridroga (heart disease) Manyasula (neck pain), sira shoola
9	Intake of curd at night	Causes pandu (anemia), Madhumeha, Amavata, chittodvega
10	Non veg. + salad	Causes skin diseases, jwara (fever), pratisyaya, grahani, madhumeha, sandhivata,
11	Intake of food without clearing bowel	causes skin diseases, Amlapittam, Udarasula (pain in abdomen), Adhmana, Katisula (Sacral pain), Avasada (depression)
12	Intake of food opposite to digestive power	Causes skin diseases, udarasula, Adhmana, Amavata, Avasada
13	Intake of food immediately after physical fatigue	Cause skin disease,
14	Intake of food without appetite	Causes skin diseases, Pratisyaya, Hrudroga, Adhmana, Sirashoola
15	Intake of food when excessively hungry	Causes jwara, Pandu, Adhmana, Atopa, Sandhi vata, Sirasula
16	Intake of food after exposure to sunlight	Causes jwara, adhamanam,
17	Taking of bath exposure to sunlight	Cases jwara, Pratisyaya
18	Cold water bath after fatigue	Cause pandu
19	Regular intake of chaumine	Causes Amavata
20	Administration of purgative in wrong way	Causes adhmanam and atopa (gases in abdomen)
21	Intake of food opposite to constitution	Causes sandhi vata

The above mentioned viruddhaahara are very popular in Indian society, due to their irregular combinations leading to viruddha (Incompatibility). They can cause stimulation of dosha (Prakopam) and cause viruddha in dhatus and resides in the shareera and become gara visha. They can cause different rogas as per the combinations, and cause Ama visha lakshanas in sharera. Due to this reason awareness about viruddhaahara (incompatible food) popular in routine in Indian society has been described here. By avoiding and keeping away from these incompatible foods we can achieve longer duration of life without any diseases.

**Conclusion:-**

It can be concluded that the approach of dietetics in Ayurveda is much individualized, practical, easy to prescribe, based on observation taken into account different incompatibilities and fulfil the needs according to age, prakriti (Constitution), desha(country) and diseases.

# PHARMACOVIGILANCE AND AYURVEDA

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## Abstract

Medicines cannot be claimed as absolutely safe for all people, in all places & at all the times. Herbal medicines are traditionally considered as harmless and do not have any adverse reactions as these belong to natural sources and are being used since thousands of years. However, this is not true as there are several case reports of adverse reactions of herbal drugs mentioned in published literature. Increased globalization of Ayurveda has raised concerns about their safety and efficacy. To tackle these concerns, a system like Pharmacovigilance has already been established. The major goals of pharmacovigilance, namely to improve patient care and safety in relation to drug use, and thus promote rational drug use are current themes of ayurvedic pharmacology (*dravyaguna vgyan*) and therapeutics (*chikitsa*).<sup>1</sup> The objective of the present article is to review the ayurvedic concepts of pharmacovigilance, implementation of National Pharmacovigilance Programme for ASU drugs.

**Keywords :** Pharmacovigilance, Ayurveda, ASU drugs.

## Introduction

The etymological roots for the word "pharmacovigilance" are Pharmakon (Greek) = drug, Vigilare (Latin) = to keep watch; awake, alert; watchfulness in respect of care, danger, caution.

Pharmacovigilance (PV) is defined as the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem.<sup>2</sup> WHO established its programme for International drug monitoring in response to the thalidomide disaster detected in 1961. Together with the WHO collaborating centre for International drug monitoring, uppsala, WHO promotes pharmacovigilance at the country level. At the end of 2010, 134 countries were part of the WHO pharmacovigilance programme. The aims of pharmacovigilance are to enhance patient care and patient safety in relation to the use of medicines; and to support public health programmes by providing reliable, balanced information for the effective assessment of the risk-benefit profile of medicines. The major objectives of pharmacovigilance are the early detection of unknown adverse reactions and interactions, detection of increase in frequency of adverse reactions, identification of risk factors and possible mechanisms underlying adverse reactions, estimation of quantitative aspects of benefit / risk analysis and dissemination of information needed to improve drug prescribing regulation.<sup>3</sup>

## Need of Pharmacovigilance in Ayurveda

In ancient times, the Ayurvedic physicians prepared medicines for their patients themselves. Currently only a few practitioners follow this tradition. Also, there is adulteration of herbal products with undeclared other medicines and potent pharmaceutical substances, such as

corticosteroids and non-steroidal anti-inflammatory agents leading to many ADRs.

According to drug and cosmetic act, 1940, the Ayurvedic drugs, which contain herbs like Ahiphena (*Papaver somniferum* Linn), Arka (*Calotropis giganteum*), Bhallataka (*Semecarpus anacardium* Linn. f.) Bhang (Cannabis sativa Linn.), Danti (*Baliospermum montanum* Mall. Arg.), Dhatura (*Datura metel* Linn.), Gunja (*Abrus precatorius*), Jaipala (*Croton tiglium* Linn), Karaveera (*Nerium indicum* Mill.), Langali (*Gloriosa superba* Linn.), Parasika Yavani (*Hyoscyamus niger* Linn.), Snuhi (*Euphorbia neriifolia* Linn.), Vatsanabha (*Acontium ferox*), Vishmushti (*Strychnos nuxvomica* Linn.), Shringivisha (*Acontium chasmanthum*); and the drugs which contain metals or minerals like Arsenic, Mercury, or lead cannot be marketed as (OTC) product. But due to lack of proper implementation of this law, many products are sold without prescription of a qualified vaidya.<sup>4</sup>

This commercialization of ayurveda has brought with it many challenges about safe use of ayurvedic medicines and need to develop pharmacovigilance program for Ayurvedic system to report, record and rectify consequences at the national level.

## Classical References

**Adverse drug reactions are one of the major causes of deaths in a hospital.**

There is a popular misconception that ayurvedic medicines are devoid of adverse reactions. However, the *Charaka Samhita*, which is a classic text book of ayurveda, describes all the adverse reactions to medicines when they are prepared or used inappropriately. According to acharya Charaka-

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योगादपि विद्धं तीक्ष्णमुत्तमं भेदुजं भवेत् ।  
भेदुजं चापि दुर्युक्तं तीक्ष्णसम्पद्यते विद्धम् ॥  
(च. सू. 1/127)<sup>5</sup>

“Even a strong poison can become an excellent medicine if administered properly. On the other hand even the most useful drug can act like a poison if handled carelessly.”

He further says-

तस्यापीयं परीक्षा – इदमेवंप्रकृत्येवंगुणमेवंप्रभावमस्मिन् देशे  
जातमस्मिन्नृतावेवंगृहीतमेवनिहितमेवमुपस्कृतमनया च  
मात्रया युक्तमस्मिन् व्याधावेवविधस्य पुरुषस्यैव  
तावन्तं दोषमपकर्षत्युपशमयति वा ।  
(च. वि. 8/87)<sup>6</sup>

Attention is given to factors like the physical appearance of the part of the plant to be used (*prakriti*), its properties (*guna*), actions (*karma; prabhava*), habitat (*desh*), season in which it grows (*ritu*), harvesting conditions (*grahitam*), method of storage (*nihitam*) and pharmaceutical processing (*upaskritam*), which must be considered while selecting the starting material that goes to form the medicine.

तस्मादातुरं परीक्षेत प्रकृतितश्च, विकृतितश्चः सारतश्च,  
संहननतश्चः प्रमाणतश्च, सात्म्यतश्च, सत्वतश्च, आहारशक्तितश्चः  
व्यायामशक्तितश्च, वयस्तश्चेति, बलप्रमाणविशेषग्रहणहेतोः ॥  
(च. वि. 8/94)<sup>7</sup>

Similarly, Charaka also describes elegantly, several host-related factors to be considered when selecting medicines in order to minimize adverse reactions like the constitution of the patient (*prakriti*), disease (*vikruti*), quality of tissues (*Sara*), compactness of the body (*sahanan*), proportionate relation of the different organs (*praman*), tolerance (previous exposure) (*satmya*), psychological state (*satwa*), digestive capacity (*ahara-shakti*), capacity for exercise (*vyayama shakti*), age (*vaya*), and strength (*bala*).

औषधं ह्यनभिज्ञातं नामरुपगुणैस्त्रिभिः ।  
विज्ञातं चापि दुर्युक्तमनर्थोपपद्यते ॥  
(च. सू. 1/126)<sup>8</sup>

A mismatched drug, wrongly selected drug or unjustifiable administration may result in untoward, sub-therapeutic or exaggerated responses in patients.

अथ खलु त्रीणि द्रव्याणि नात्युपयुंजीताधिकमन्येभ्यो द्रव्येभ्यः  
तद्यथा –पिप्पली क्षारः लवणमिति ॥  
(च. वि. 1/15)<sup>9</sup>

Pippali, kshara, lavana when used extensively produce harmful effects.

In ayurveda, metals and mineral medicines are given as *bhasmas* (incinerated mineral formulations) or in combination with plants as herbo mineral formulations. Various shodhana procedures and bhasma parikshan methods have been mentioned in ayurvedic classics. But when precautions are not taken while manufacturing, these medicines may lead to various adverse effects.

विशुद्धिहीनं यशदं मृतचेदं विशोधितंवाप्यमृतंत्वविज्ञैः ।  
निषेवितवैजनयेद् गुल्मप्रमेह क्षय कुष्ठकादीन् ॥  
(र. त. 19/97)<sup>10</sup>

If yashad(zinc) bhasama is administered without purifying it then it may cause gulma, prameha, kshaya, kushtha etc. Although these medicines are widely used in India, doubts about their long-term safety come up due to the presence of toxic metals in them<sup>11</sup> and there are reports related to adverse reactions.<sup>12</sup> It is important that therapeutic procedures practised in Ayurveda should also be brought under the pharmacovigilance. *Panchakarma, Ksharasutra, Rakta mokshana* are few such procedures. In these cases, the procedure-related harm needs documentation and discussion. Though Pharmacovigilance has already been established for ASU drugs, still there are many ayurvedic practitioners who do not report any adverse reactions. Also from above classical references, one should be alert about the adverse reactions of ayurvedic medicine while practising them.

### National Pharmacovigilance Programme for ASU drugs

In India, National pharmacovigilance programme under the control of Central Drug Standards Control Organization (CDSCO) has already been started since 2003. WHO has emphasized that it should include traditional medicines in pharmacovigilance system and has published guidelines on safety monitoring of herbal medicines in pharmacovigilance systems in 2004. On 29 September, 2008 National Pharmacovigilance Programme for Ayurvedic Siddha and Unani Drugs was launched by central government recognizing Institute of Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurveda University IPGT &RA, Jamnagar as National Pharmacovigilance Resource Centre for Ayurveda, Siddha and Unani Drugs (NPRC-ASU) in India under the Central sector scheme for upgradation to Centre of Excellence.<sup>13</sup> Under NPRC-ASU drugs, there are eight Regional Pharmacovigilance Centres (RPC) for ASU drugs. There are 30 Peripheral Pharmacovigilance Centres (PPC) for ASU drugs, which are working under these eight RPCs, across the country. Continuing Medical Education and public meetings are being conducted to raise health professional's awareness of

ASU drugs. A web portal, 'ayushsuraksha.com' has been launched for online registration of ADR related to ASU drugs through an "e format".

The National Pharmacovigilance Programme for ASU medicines will have the following objectives.<sup>14</sup>

**Short-term objectives:**

To develop the culture of notification

**Medium-term objectives:**

To involve healthcare professionals and professional associations in the drug monitoring and information dissemination processes.

**Long-term objectives:**

To achieve operational efficiencies that would make National Pharmacovigilance Programme for ASU drugs a benchmark for global drug monitoring endeavours.

**Who should report Adverse Drug Reactions?**

All health care workers, including doctors, pharmacists, nurses and other health care professionals are requested to report all suspected adverse reactions to drugs (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is unusual, potentially serious or clinically significant. It is vital to report an adverse drug reaction to the nearest and appropriate pharmacovigilance centre even if you do not have all the facts or are uncertain that the medicine is definitely responsible for causing the reaction.<sup>15</sup>

**What to report?**

All adverse reactions / interactions suspected to have been caused by ASU drugs alone or along with any other drugs, any untoward medical occurrence at any dose resulting in death, requires hospitalization or prolongation of existing hospitalization, results in persistent significant disability or incapacity are to be reported.

**Where to report?**

The reporting on prescribed format will be done to any of the pharmacovigilance centres.

**Will reporting have any negative consequences on the health worker or the Patient?**

This adverse drug reaction report does not constitute an admission that you or any other health professional contributed to the event in any way. The outcome of the report, together with any important or relevant information relating to the reaction you have reported, will be sent back to you as appropriate. The details of your report will be stored in a confidential database. The names of the reporter or any other health professionals named on report and the patient will be removed before any details about a specific adverse drug reaction are used or communicated to others. The information obtained from your report will not be used for

commercial purposes. The information is only meant to improve our understanding of the medicines we use in the country.

**What happens to the information submitted?**

The information in the form shall be handled in confidentiality. Peripheral Pharmacovigilance Centres shall forward the form to the respective Regional Pharmacovigilance Centres which will carry out the causality analysis. This information shall be forwarded to the National Pharmacovigilance Resource Centre. The data will be statistically analysed and forwarded to the Dept. of AYUSH, Govt. of India.

**Scope of Pharmacovigilance in ayurveda**

The goals of Ayurveda's pharmacovigilance program are to improve:

- Patient care and safety when using ayurvedic medicines and related interventions;
- Public health and safety records of ayurvedic medicines
- Assessment of benefit, harm, effectiveness, and risk of medicines
- Encouragement of safe, rational, and more effective (including cost effective) use, and promotion of understanding, education, and clinical training in pharmacovigilance for ayurvedic medicines and its effective communication to the public. Many cases have been reported in the recent past regarding ADRs and drug-drug interactions at various national and international forums.<sup>16</sup>

**Conclusion**

The Pharmacovigilance system is prevalent from ancient days. Validation with suitable documentation is the need of the hour. Now it is time to encourage ayurvedic practitioners to analyse and report any ADRs that occur in patients. Pharmacovigilance report should be developed and shared for future reference to medicinal products to avoid any case of severe adverse reaction, since these are traditional medicinal products and are used widely. There should be clinical training in pharmacovigilance for ayurvedic medicines and its effective communication to the public. Also, quality assurance and control in manufacture of ayurvedic medicines should be there. The ayurvedic pharmaceutical industry should be motivated to focus on pharmacovigilance of ayurvedic medicines. The ultimate goals of pharmacovigilance are:

- Rational and safe use of medical drugs
- Assessment and communication of the risks and benefits of drugs on the market
- Educating and informing of patients

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# RASAYAN AND AGEING

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## Abstract

*Rasayan* or Rejuvenation therapy is one of the most specialized branches of Ayurveda which is practiced for attaining the youthfulness, vigor, vitality of body and upright cell functions, thus keeping away debility. Every human being dreams of disease free life. *Rasayans* are considered as a nutritional as well as medicinal support of body system and to delay ageing. Drugs which are used as *Rasayan* have been proven to have antioxidant properties. The drugs, diet and regimen which provide longevity by delaying ageing and preventing disease are called *Rasayan*. Most of the *Rasayan* drugs have *tridosha shaman* properties thus maintaining a vital balance in the body. The various benefits of *Rasayan* are promotion of longevity, positive health and promotion of excellence of lustre-voice-complexion, enlightenment of mind and memory, intelligence quotient, preservation of youth, optimum physical strength, preservation of sleep dysfunction, stimulation of digestion and metabolism and cure muscle fatigability. In simple terms, *Rasayan* is that which roots out morbidity, sedates the grieves, corrects trans membranous portals and channels and checks the disease, thus delaying the ageing process. Experimental evidence says that *Rasayan* drugs provide protection against different types of infections through macrophagic activity. It harmonises functions of body by modulating immune-endocrine mechanism. Ayurveda texts are rich with plenty of single drug and multi drug combinations which can be used as *Rasayan*. The paper aims to highlight the use of *Rasayan* as a therapeutic modality in delaying the process of Ageing.

**Key Words:-** Rasayan, antioxidants, srotas, agni

## Introduction

A healthy and long life span is pre-requisite to procure *Purusartha Chatustaya* i.e., *Dharma, Artha, Kama* and *Moksa*. Healthy life can also lead to attainment of *Ubhayaloka Hita (Ihaloka and Paraloka)* which is subdivided into *Pranaishana, Dhanaishana* and *Paralokaishana*, three basic desires or pursuits of life. *Pranaishana* is *prima vitae* because other two can be achieved if and only if *Prana* is persisting. So, main emphasis is given on the protection of body and prolongation of life. For this *Rasayana Tantra* has exclusively been included in *Ashtang Ayurveda* for rejuvenation and geriatric care.

## Ageing

Ageing is natural and inevitable biological phenomenon. It is a process of unfavorable progressive changes, usually correlated with the passage of time, becoming apparent after maturity and terminating invariably in death of the individual. It is a general response that produces observable changes in structure and function and increased vulnerability to environmental stress and disease, Sir James Sterling Ross has commented "You don't heal old age, you protect it, you promote it and you extend it."

Ageing has both the positive component of development and negative component of decline. Ageing may appear early, timely or late with less, moderate or mere symptoms. Normal ageing refers to the common

complex of diseases and impairment that characterizes many of the elderly whereas successful ageing refers to a process by which deleterious effects are minimized, preserving function until senescence make continued life impossible.

In Ayurvedic texts, the concept of ageing and rejuvenation finds a prominent place. Ageing has been described under heading of '*Jara*'. In *vridhhaavastha* there is diminution of *Dhatu*, strength of sense organs, energy, virility, understanding, retention power, memory and speech<sup>1</sup>. Also, there are somatic changes (including pathological conditions) along with psychic variations that may occur. Somatic changes like *twakparushya* (dryness of skin), *shaithilya*(lethargy), *mamsa-sandhi-asthi-dhatukshaya*(Tissue wasting), *indriyahani* (impairment of sense organs), *prabhahani*(loss of body lusture), *agnisada*(Digestive impairment), *khalitya* (Alopecia), *vali*(Wrinkles in the skin), *palitya*(Graying of hair), *kasa-swasa* are observed. Mental variation includes *graham,dharana, smarana, vachanahani* along with *paurush-prakram-utsahahani*. *Charak* has given importance to both physical and psychological changes whereas *Sushruta* has concentrated more on physical variations.

## The concept of Jara

*Jara* has been divided into two types

- *Kalajajara* (timely ageing)
- *AkalajaJara* (Premature ageing)

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*Jara* coming at proper age i.e. after sixty years of life is *Kalajajara*. In Ayurvedic texts human life span is divided into 3 major categories<sup>1</sup>-

- *Bala*,
- *Madhya* and
- *Vridhdhaavastha*.

*Vridhdhaavastha* is the last phase of *Vaya*. From this stage onwards, gradual deterioration of functions of physical and mental faculties increases. The *Kalaja jara*<sup>2</sup> is of less intensity, slow progressing and less troublesome. It occurs at proper age even after following the daily and seasonal regimen. This is nothing but chronological ageing. *Jara* which occurs before its prescribed time is *AkalajaJara*. It refers to the ageing which occurs before the appropriate age. This is Biological ageing. No specific etiological factors of ageing process have been described in any of the Ayurvedic Texts. But there are some factors which can be considered favorable in this regard, such as *kala*, *swabhava* and predominance of *Vatadosha*

1. ***Kala***: The foremost important factor to be considered from Ayurvedic standpoint is *Kala*. *Charak* and *Sushruta* emphasized the involvement of *Kala* in the development of an individual. *Kala* is responsible for the diminution of *Dosha*, *dhatu*, *mala* and *vridhdhaavastha*. Modern scientists also agree with the influence of time factor on ageing process<sup>3</sup>.
2. ***Swabhava***:- The second foremost factor is *swabhava* which means the inherent property or by nature itself. There is a theory of Natural destruction/phenomenon (*swabhavavada*). *Sushruta* mentioned that *jara* is a *swabhavik vyadhi*.<sup>4</sup>
3. **Predominance of *Vatadosha***:- During old age, *Vata* overpowers the other two *Dosha* and shows its dominance resulting in increased catabolism in body tissues.

It is observed that there are other factors which also influence the process of ageing such as heredity, environment, functional activity, dietary and personal habits. Dietary habits such as excessive intake of *lavana* (salt), *amla* (sour), *katu* (spicy), *suskashaka* and *mamsa* (dry vegetables and meat), *viruddhaanna* (incompatible diets), *guru anna* (heavy diet) promotes the process of ageing. Personal habits such as *atimargagaman* (excessive physical activity), *diwaswapan* (day sleeping), *nityastrisewan* (excessive intercourse), *nityamadyasevana* (excessive alcohol intake) enhances the process of ageing due to increased wear and tear of body tissues. Various psychological factors such as *bhaya* (fear), *krodha* (anger), *shoka* (sorrow), *lobha* (greed), *moha* (affection), *rukshavani*

(harsh voice) also promotes the ageing process. The signs and symptoms of ageing can be divided into two parts viz. physical and mental.

Physical signs and symptoms<sup>5</sup> are *vali* (wrinkles), *palitya* (graying of hairs), *khalitya* (baldness), *dantashailithya/patina* (dental loosening and loss), *krishta* (emaciation), *hasta-padajihwa&grivhakampta* (tremors), *namana* (kyphosis), *shaktihinata* (loss of power), *balahani* (loss of energy), *viryakshaya* (loss of semen), *agnimandya* (loss of digestive power), *drishtimandya* (diminution of vision), *vakashaktihani* (diminution of speech), and *ayukshaya* (diminution of immunity). Mental sign and symptoms are *gambhira*<sup>6</sup> (seriousness), *avasada* (depression), loss of *ekagrata* (concentration), *smritinasha* (loss of memory), *ekantapriyata* (loneliness), *chinta* (anxiety), *dhritinasha* (loss of retention power). Although, no treatment is available which can prevent ageing but it can be delayed and managed by *Rasayan* and other therapies.

### ***Rasayan* & its effect on Ageing**

*Rasayan*<sup>7</sup> or rejuvenation therapy is one of the most specialized branches of Ayurveda which deals with maintaining the youthfulness, vigor, vitality of body and cell function upright, thus keeping away debility. The drugs, diet and regimen which provide longevity by delaying ageing and preventing disease are called *Rasayan*. Every walk of life requires rejuvenation and longevity promotion and every human being dreams of disease free life and long lasting results with medication. *Rasayan* is a nutritional medicine system. Both types of *Jara*, i.e. *kalaja* and *akalaja* can be managed by *Rasayankarma*. *Kalajajara* is *yapya* whereas *akalaja* is *sadhya*. *Rasayan* karma can check (slow down) *kalajajara* to some extent but not possible to reverse it. *Akalajajara* may be a result of not following *swasthavritta* or *sadvritta* or *aacharrasayan*. *Nidanparivarjan* is the main treatment of all the disease described in Ayurveda. But *Nidanparivarjan* may not be sufficient to check the flow of already going on ageing process. So, proper *rasayan* therapy should be administered in such cases. Drugs which are used as *Rasayan* have proven antioxidant properties. Most of the *Rasayan* drugs have *tridosha shaman* properties thus maintaining a vital balance in the body. *Rasayan* improves the nourishment to *Dhatu*, boosts the immune system and delays ageing. It nourishes the tissue elements more, increases the anabolic activity & improves the immune system. It corrects the *Agni* which is responsible for *Ayu*, *bala*, *varna*, *ojas* etc. *srotas* and *dhatu* are properly formed. *Rasayana* drug shows its effects of rejuvenation by its ability to build up the worn out tissue and replenish the nutritional deficient states. An apparent weight gain and improved quality of life after using such drugs prove this

hypothesis. Thus *rasayana* drugs may augment the formation of body tissue (*dhatuvaradhaka*) by supplementing the anabolic metabolism. (Chhabra Pooja et al) Furthermore, a study has revealed that, the stimulation of both cellular and humoral immunity is mediated through the activation of the psycho-neuro-endocrine-immune (PNI) axis. By this way, a single *Rasayana* drug is capable enough to exert numerous actions in the body<sup>8</sup> *Rasayan karma* stimulates the production of *ojas*. *Rasayan* therapy has free radical scavenging and antiageing effect. *Rasayan* is not a single drug. It bears wide coverage on drug, diet and discipline. It is achieved by *achararasayan*, *ahararasayan* and *dravyarasayan*. Drugs having *madhura*, *guru*, *snigdha*, *sheeta* properties act at the level of *rasa*. By promoting the nutritional value of *rasa* these help in nourishing the *dhatu*. Examples of such drugs are *shatavari*, *madhuyashti*, milk, *ghrita*. *Rasayan* drugs like *pippali*, *bhallataka* act at the level of *agni*. These drugs vitalize the organic metabolism leading to an improved structural and functional pattern of *dhatu*. *Rasayan* drugs like *jivaniyagana* drugs, *swarna* and *pippali* cause *strotoshodhan* and these are supposed to influence *oja* which induces *bala* and *vyadhikshamatva*. Thus, the overall effect of *Rasayan* therapy is the achievement of *arogya*, *dirghayu*, *tarunya*, *smriti*, *medha*, *prabha*, *varna*, *swara*, *dehabala*, *indriyabala*, *kanti*, *virya* and *vrishyata*.

### Conclusion

From the above discussion it can be inferred that *Rasayana* agents contain in their bulk high quality of nutrients and as such when administered they are directly added to the pool of nutrition and in turn help in improved tissue nourishment leading to subsequent *Rasayana* effect. *Satavari*, *Dugdha*, *Ghritha* etc. are few of the examples of *Rasayanas* acting at the level of *Rasa*. Several *Rasayana* drugs are known to promote digestion

of food and vitalize the metabolic activity resulting in turn to improved nutritional status at the level of *dhatu*. *Bhallataka* is an example of *Rasayanas* acting at the level of *Agni*. Many such *Rasayanas* act indirectly as anabolisers. By promoting the competence of *Srotas* i.e. the micro-circulatory channels in the body leading to better bio availability of nutrients to the tissues and improved tissue perfusion. This is another mode through which a *Rasayana* therapy may help in promotion of nutritional status. *Guggulu* a *Rasayana* mentioned with priority by *Sharngadhara* is an example of *Rasayana*'s effectiveness at the level of *Srotas*. The recently reported hypolipidemic and anti-atherosclerotic activity of *Guggulu* is in confirmity with the *Rasayana* effect of this drug. All these effects in totality lead to delay in catabolic processes in the body, promotes healing of worn out tissues, enhances the anti-oxidant activity thus delaying the ageing process.

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# THE CONCEPT OF GENETICS AND HEREDITY IN AYURVEDA

**Dr. Amandip Kaur**

**Abstract:** Genetics holds crucial role in understanding the constitution of body. Therefore, the study of genetics has attained central importance in the field of all life sciences. *Ayurveda* has covered various aspects of science. The concept of heredity and genetics have been explained at various places and in various ways. The terms *beeja*, *beejabhaga* and *beejabhagavayava*<sup>1</sup> have been used to indicate the components of heredity. The diseases that arise by their vitiation have been described in *Sushruta Samhita* and *Charak Samhita*. Different factors responsible for manipulating the traits of foetus have been mentioned which are still untouched by the modern science. *Pumsavan samsakaar*<sup>2</sup> is the such procedure to alter the sex of the offspring. *Acharaya* have mentioned the concept of *dauhrida* and deformities that arise because of ignorance of desires of mother during this period.

## Introduction:

Ayurveda texts behold immense treasure of science and philosophy. It is advanced and sophisticated in its own way. The concept of genetics is well known and widely accepted by the world. Genetics is the study of genes. It was introduced in the contemporary world by Augustinian monk Mendel in 1866 as the model of constant factor of trait. But the ancient *Ayurveda* texts which were written before Christ give the evidence of wide knowledge about elements of heredity. The concept of *Beej*, *Beejabhaga*, *Beejabhagavayava*, *Dauhrida*, *Swabhaava*, *Prakriti*, *Vikriti* have been described at various places in the *Brihatatrayee*. *Acharaya Charak* has emphasized that the *beej* or part of *beej* is responsible for formation of a particular organ.<sup>3</sup> This article aims to put together some factors in *Ayurveda* which point towards the basis to genetics and heredity. The above said factors will be discussed in brief in the present article.

## The Basics of Genetics and Heredity:

Heredity is defined as the sum of all biological processes by which particular characteristics are transmitted from parents to their offsprings whereas genetics is the study of heredity, also defined as the study of the variation of inherited characteristics. The Mendel's model of constant factor states that one constant factor controls one specific phenotype in progeny. He stated that each parent will transfer one copy of allele to the offspring. So, the offspring will have half of the genetic material from mother and half from the father. He also stated that different traits assort independently of one another in gamete production.

In ayurveda similar concept can be studied as follows :  
*Beeja*, *Beejabhaaga* And *Beejabhagavayava*:<sup>4</sup>

- *Beeja* generally means a division of the ovum or

sperm. The nearest term in the parlance of modern genetics is the chromosome. A chromosome is a structure of DNA, protein and RNA found in cells.

- *Beejabhaaga* means a part of the *beeja*. The nearest term in the parlance of modern genetics is the gene. Gene is the unit of genetic information that controls the synthesis of one polypeptide or structural RNA molecule. Genes are the functional units of heritable material that code for specific aspect of the phenotype.
- *Beejabhagavayava* is a fraction of a part of *beeja*. The nearest term in the parlance of modern genetics is allele. An allele is an alternative form of gene (one member of a pair) that is located at a specific position (locus) on a chromosome.

## Dauhrida State: <sup>4</sup>

As soon as senses are manifested in the embryo, the condition of mother is called *dauhrida*. The foetal desires are reflected in the heart of pregnant woman and the mother longs for the objects desired by the foetus. If such desires are ignored, the foetus may either be destroyed or deformed.<sup>5</sup>

By the suppression of the longings, the *vata* gets vitiated, moves inside the body and destroys or deforms the foetus in the formative stage.<sup>6</sup>

Deformities arise due to suppression of the desires of *dauhrida*. If the desires of mother are ignored, the lady would deliver a child with hump, with deformed hands, lame, dull, dwarf, with deformed eyes or no eyes and muffled voice. If the desires are fulfilled, she delivers powerful and long lived son otherwise there is risk to foetus and herself.<sup>7</sup>

This concept is an example where the genotype of the foetus can be altered by the conduct of mother. During pregnancy the diet and conduct of mother can effect the genetic make up of the child. State of mind of the mother can have an impact on the health of the foetus.

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**Svabhaava:**<sup>8</sup>

Formation of foetal parts and sub-parts take place by svabhaava. Teratological deformities take place due to atheism of parents, unrighteous past deeds and aggravation of vata.<sup>9</sup> Foetuses having face of serpent, scorpion, gourd and other deformities are caused by excessive unrighteous behaviour of woman.<sup>10</sup> The mother inherits expiration, inspiration, movements and sleep to the foetus.<sup>11</sup>

Svabhaava is considered responsible for arrangement of body parts, falling and re-appearing of teeth and absence of hair on palm and soles. The concept of svabhaava in the texts clearly reflects the effect of genotype on phenotype and the deformation of foetus due to the natural cause which indirectly signals towards the inheritance and genetic factor.

Pre-conception regimes and vedic rites can be adopted for procreating a child of excellent qualities.<sup>12</sup> This regimen is an excellent example in Ayurveda text where selection of desired traits is done before conception.

Another procedure is adopted to procreate a child of desired sex. One can change the sex of the child by the pumsavana procedure<sup>13</sup> before manifestation of the gender of the foetus. This procedure is speciality of Ayurveda text. This is an example where Ayurveda has an approach to alter the genotype at the initial stage of the foetal life.

**Prakriti:**

Prakriti is the natural disposition or constitution of an individual. This factor is determined by sperm and ovum, season and condition of uterus, food and regime of mother, nature of mahabhootas comprising the foetus.<sup>14</sup> The foetus gets afflicted by the dominant doshas associated with these factors and this dominance of doshas determine the prakriti. Prakriti depends upon various factors:<sup>15</sup>

- **Jaatiprasakataa (caste):** Birth in particular caste defines the characteristic disposition of an individual. e.g. Purity among Brahmans.
- **Kulaprasakataa (family):** Birth in a particular type to family alters the genotype and phenotype of a foetus. e.g. Birth in a good family automatically leads to good conduct and character of an individual as compared to the birth in a family of thieves or crooks.
- **Deshaanupaatini (locality):** The individuals of a particular locality share some common features.
- **Kaalaanupaatini (time):** Time has great impact on the genotype of individuals. e.g. In ancient times people had better physique as compared to present era. Time has made alterations in the genetic makeup of an individual.

- **Vaayunupaatini (age):** In various age groups the status of doshas is changed. e.g. In children kapha is dominant; in adults pitta is dominant and in elderly vaata is dominant.
- **Pratyaatamanitaa (individual):** Certainly there is difference in genotype and phenotype of each individual. It varies from person to person. No two individuals are similar.

**Heredity defects and deformities:**<sup>16</sup>

In *Ayurveda* various conditions are described which arise due to vitiation of elements of inheritance. Such elements are microscopic and the causes of their vitiation is either due to *doshas* or due to misconduct of the parents. Few example are as follows:

- If part of the *beej* which is responsible for the formation of the particular organ is vitiated, this will result in the vitiation of the respective organ. If it is not vitiated, there would be no vitiation of the particular organ either. So, both the possibilities are there. There might be vitiation of the particular organ depending upon the vitiation of the specific *beej*.
- The example of leprosy is worth considering. The progeny of leper will not always be a leper. Such a progeny will be a leper only if the parental seed is also affected by *doshas* causing leprosy.
- The progeny of blind person will also not necessarily suffer from blindness. As presence or absence of sense organs is determined by the effect of past action.

**(Hereby, the Mendelian law of inheritance is justified.)**

*Unimpaired beej is prerequisite dominant factor for producing a healthy progeny. Ch. Sa 3/3*<sup>17</sup>

*Defects in beej lead to sterility. Ch. Sa 4/28*<sup>18</sup>

There is special reference of hereditary (*aadibala pravritta*) and congenital (*janam balapravritta*) diseases.<sup>19</sup>

- According to *Acharaya*, hereditary diseases (*aadibala pravritta*) are the diseases that are caused by vitiated sperm and ovum. Such as leprosy, piles etc. They can be maternal or paternal. Congenital (*janamabala pravritta*) diseases occur due to unwholesome behaviour of the mother.
- *Kulaj roga* are quoted in the context of *prameha*. A diabetic father has diabetic son, this *kulaj* diseases of son is incurable due to vitiated *beej*.<sup>20</sup>
- *Svabhaavaja* and *sahaj vyaadhis* signify the inherited diseases. Various pathologies can be seen which arise due to vitiation of genes.

- If the woman conceives when her ovum and uterus were not completely vitiated but simply afflicted by *doshas*, one or many of the organs of the foetus derived from maternal source get deformed.<sup>21</sup> (e.g. skin, blood, heart, kidney etc.<sup>22</sup>)
- When the part of the *beej* which is responsible for the production of the sperm is excessively vitiated, then mother gives birth to a sterile child.
- When the *beejabhaaga* in the ovum of the mother which is responsible for the production of the uterus is excessively vitiated, then she gives birth to sterile child.
- When the *beejabhaagavayava* in the ovum which is responsible for the uterus is excessively vitiated, then *putiprajaa* (who delivers dead foetus) is produced.
- When the *beejabhaagavayava* in the ovum which is responsible for the uterus and portions of *beejabhaaga* which are responsible for production of organs that characterise a female viz. breasts, genital organs etc in the ovum gets excessively vitiated then *vaartaa* (who is not complete female but only having feminine characteristics)
- Parallel defects are seen in male child.<sup>23</sup>

### Conclusion:

Thus, from this information it can be concluded that there is significant and ample description about genetic and hereditary diseases in all texts of *Ayurveda*. *Beej*, *beejabhaaga*, *beejabhaagavayava* and the concept of *prakriti and svaabhava* are the various forms by which genetic and hereditary disorders can be studied and researched on.

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# YOGA-A MANTRA FOR THE MANAGEMENT OF LIFE STYLE DISORDERS

Dr. Navdeep Kaur

## Abstract:-

Human beings are very small units of universe. When one is in proper tuning with the rest of the world he remains healthy and happy whereas if there is any disturbance in this harmony disease appears. In this lifestyle plays a very important role. Rapidly increasing incidence of life style related ailments is posing a big challenge to modern medical system. It is here that yoga appears to make a vital contribution to the modern medical system for the management of disorders related to lifestyle. This article evaluates some yogic asanas for management of disorders related to lifestyle.

**Key word:** Yoga, obesity, depression, bronchial asthma.

## Introduction

Life style is a way of living of individuals, families and societies which they manifest in coping with their physical, psychological, social and economic environments on a day to day basis. Effort to maintain good health (swasthya), stabilized mind (sthira buddhi), right time of wakefulness (smadhi) and wisdom has been recognized as important contributing factors to achieve various goals of life and to fulfill different aspirations and ambitions of suffering. Human sufferings have been categorized into two main headings:

“Agantuka vyadhi” i.e due to extraneous factors and parameters.

“Nija vyadhi” i.e psycho somatic conditions or sufferings due to the factors related with the self.

Yoga is supposed to be the best type of medicine for nija vyadhi which could be equated with lifestyle related disorders for our purpose. Traditional yoga literature has classified various parameters which decide and influence our lifestyle and lifestyle related disorders under the following headings:

- Different kinds of inputs reaching the consciousness (Ahara).
- Lack of inputs helping the consciousness (individual) to rest and recuperate (nidra).
- Different kinds of fears, phobias and complexes (bhaya).
- Indulgences to fulfill and satisfy sexual needs, urges and desires (maithuna).

## Some useful Asana and lifestyle disorders

### Obesity

Obesity is becoming a common health hazard and leads to many other diseases like coronary heart disease, hypertension, diabetes, psychosomatic disorders. Main cause of obesity is excessive eating and insufficient or lack of exercise.

## Yogic cure

The biggest advantage of this system of cure is that the individual does not have to undergo fasting and feel any weakness. Also the reduction of weight is gradual so that the person does not feel any loss of strength. Due to gradual reduction there is no sagging of facial skin and conditioning of the body takes place simultaneously. Yogic way reduces weight in a lasting and permanent way.

## Recommended Asanas

- Surya namaskara: It exercises every part of the body.
- Uttanpadasan (raising the legs) reduces obesity of thighs, hips.
- Urdhvhast-uttanasan (raising half arms) reduces fat from lower part of the body.
- Katichakrasan (Hip twist) develops sleek waist
- Hastuttan padasan (hands touching raised legs) reduces fat of abdomen, thighs, arms.
- Others are sarvangasan, Dhanurasan, Shavasan, Halasan, Naukasan.

## Anxiety, Stress and Depression

### Anxiety

Anxiety disorders are characterized by fear, avoidance behavior and somatic symptoms like head-ache, sweating, muscle spasm, palpitations and hypertension often leading to fatigue. Types include Phobia, Panic disorders, generalized anxiety disorder that includes OCD.

### Stress

Mental health and stress are two sides of the same coin, with an inverse relationship between them. Higher the mental health lower is the experience of stress and the resultant physical health problem. Thus to minimize the experience of stress and improve physical health it is necessary to concentrate on mental health. Stress may be described as an individual's reaction in any situation. Situations in themselves are neutral with respect to stress.

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### Depression

Depression is a leading contributor to the global maladies resulting in a huge loss of productivity, marked with very low self esteem and a virtual loss of interest. Both in anxiety and in depression an individual is in nervous and defensive automatism that renders him as a slave of impulses and emotions.

### Yogic Cure

Suppression and repression phenomena have a close relevance to stress, anxiety and depression. All yoga practices, particularly trataka and meditation, provide easy ways of unveiling one's own ego defenses, thereby facilitating mental catharsis in case of normal and mental patients alike. Yama and Niyamas offer an ample possibility of sublimation for the purpose. In the yogic practices viz. asanas, pranayamas and meditation the common mechanism of tackling stress, anxiety and depression can be summarized as:

- Proprioceptive impulses from the musculoskeletal system are responsible for body awareness.
- Viscero-ceptive impulses from the internal organs are responsible for internal awareness.
- Many a dormant cortical pathway are stimulated by proprioceptive and viscerosensitive impulses arising from different regions of the body. The resulting sensory feedback brings relaxation not only to the respective regions but it also brings repressed wishes, emotions and thoughts to the surface, which finally find their way out, resulting in relaxation and reduction in stress, anxiety and depression.
- The internalized awareness, gained through an enhanced sensory feedback, makes yoga a special and probably the most effective intervention, different from all other interventions for stress, anxiety and depression.

### Bronchial asthma

It is characterized by increased responsiveness of the bronchial mucosa to various stimuli, clinically manifested by difficulty in breathing due to generalized narrowing of airways.

Following yogic exercises are helpful to purify and improve the functioning of the upper respiratory tract:

#### 1. Shatkarma (procedures for systematic purification)

- a. Kunjal kriya
- b. Vastra dhoti
- c. Sutra neti
- d. Jal neti
- e. Kapal bhati
- f. Bhastri

#### 2. Tadasan, Pawanmuktasan, Ustrasana, Garbhasana, Bhujangasana, Gomukhasana, Vakrasana etc.

### 3. Pranayam:

- a. Suryabhedan pranayam
- b. Ujjai pranayam
- c. Bhastrika pranayam
- d. Bhramari pranayam

Among these, Asanas are broadly divided into three distinct groups:

1. **Antirheumatic group asanas:** This group includes sanu chakra, ardha titli shroni chakra, poorna titli, mushtika bhandhan, skandha chakra and greeva sanchalana. These group of asanas are for those debilitated by rheumatism, arthritis, high blood pressure or other ailments where vigorous physical exercise is not advised.
2. **Digestive group asanas:** This group comprises of padottan asana, padachakrasana, suptawanmuktasana, supt udarkarshanasana, naukasana. This group of asanas is concerned specially with strengthening the digestive system. It is good for people with indigestion, constipation, acidity, excess gas, lack of appetite, diabetes, disorders of reproductive system.
3. **Shakti Bhand group asanas:** Chaki chalanasana, nauka sanchalanasana, namaskarasana etc are included in this group. This group of asanas are concerned with improving the energy flow within the body and breaking down neuromuscular knots. It can also be practiced after pregnancy for retoning flaccid muscle.

### Conclusion

Traditional societies are being gradually replaced by modern lifestyles giving place to problems which amplify economic challenges for the health sector. Integrated approach of yoga therapy based on ancient yoga texts as traditional science born in this motherland shall provide the right answer to social economic burden. So to overcome or minimize disorders related to life style one should practise yogic asanas. Yoga should be learnt scientifically only then the required results can be achieved.

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# PANCHMAHABHOOTA (AN EPITOME OF SARVATANTRA SIDDHANTA)

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## Introduction:

Mula- siddhanta as the noun specifies that the whole of the tree is reliant on the roots . Siddhanta is base of all and as mentioned by Acharya Charaka :

सिद्धांतो नाम स यः परीक्षकैर्बहुविधं परीक्ष्य  
हेतुभिश्च साधयित्वा स्थाप्यते निर्णयः ।  
(च. वि. 8/37)

A demonstrated truth established after several examination and reasoning is known as Siddhanta. It is of four types as follows :

1. Sarvatantra Siddhanta or truth which is common to all scriptures, e.g existence of curatives for curable diseases.
2. Pratitantra Siddhanta or truth specific to a given scriptures, e.g- in other scriptures all diseases are described to be caused by dosas viz. Vata etc. but in Charak samhita diseases are caused by dosas, viz.vata etc. as well as evil spirits (germs.)
3. Adhikarana Siddhanta or truth implied from a given context e.g- no liberated soul indulges in action leading to bondage for he is free from all desires ; this pre position implies truth like fruit of action, liberation of the soul and existence of life after death.
4. Abhyupgama Siddhanta or truth taken for granted i.e. hypothesis (postulation) for e.g. things are explained sometimes on the basis of the predominance of matter , sometimes that of qualities and that of potentiality. The Siddhanta described by ancient aacharyas are sarvakaalik, sarvbhaumik and sashvata as they are mentioned on behalf of karya-karna hetu.

## Panchbhoota Siddhanta:

If everything is consciousness (*Brahman*), then how does this conscious energy put on the appearance of material solidity. Why does the table appear solid? In order to bridge the gulf between consciousness and apparently durable matter, ancient Indian sages postulated (or “divined”) that all physical things are constituted of five subtle elements called *Pancha Mahabhootas* earth, fire, water, air, ether. These are not the elements known in the conventional sense (e.g. “water” does not imply the water, and “earth” does not mean soil) but are actually subtle conditions which together create the perception of forms which can be sensed by the human mind. The actual names of these five elements are *Akasha* (ether), *Vayu*(aeriality), *Agni*(fire), *Apas*(liquidity) and *Prithvi*(compaction).

This is the siddhanta acceptable to all the darshana which has been established after viewing different guna, karma, svabhava, and avastha etc. of dravya, after keenly examining evolution and by visualizing different functions of Sukshmabhoota by logically explaining panchpanchak on minute level by sages of India. Modern Tatvavaad (Philosophical knowledge of subject), parmanuvaad, vividh avasthavaad and niharikavaad all of these have accepted it unoppositively and have seconded it. It forms the corner stone of Garbhvikasvaad, dehsanghatana, tridoshavaad, niyatartha grahanshilta of indriya, rasvaad and gunakarn vaad of dravya and its classification. All the major and micro creations whether they are living or non living are made up of panchmahabhoota or their anyonyanupraves. The process of germination of seed comprises of these five panchbhoota, similar process is seen in case of human embryo formation and development.

तं चेतनावस्थितं वायुर्विभाजि तेज एनं पचति, आपः  
क्लेदयन्ति, पृथ्वी संहन्ति, आकाशं विषर्घयति ।  
(सु. शा. 5/3)

Human beings possess five Gyanindriya which reside in five Indriyaadhishtana, which perceives five shabadaadi vishya, and produces five indriya buddhi or gyan, as such there ashryabhoot dravyas should also be five and those five are undoubtedly the panchbhoot.

-Ch. Su. 8/7-11

The Marmas also entails panchmahaboot as sadya-pranahara marma is agneya, kalantar pranahara marma is agneya and saumya, vishalyaghana marma is vayavya, vaikalyakara is saumya and finally rujakara being vayavya.

-Su. Sh. 6/17

Tridosh also comprises of panchmahaboot where vaat has predominance of vaayu, pitta has predominance of tejabhoot and kapha being jalabhoot predominant. Similarly shadrasa also have the panchbhoot compositions like madhura being composed by prithvi and jala, amla by prithvi and agni etc. Apart from all the above said panchmahabhoot has also role in the chikitsa of rogas,as two main mode of treatments are there, one being samshamana and other being samshodhana chikitsa, both of these treatment modalities entail panchmahabhoot for e.g:

- Virechana dravya : prithvi + jala
- Vamana dravya : agni + vayu

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- Samshamana dravya : aakasha
- Graahi dravya : vayu
- Deepana dravya : agni
- Lekhana dravya : vayu + agni
- Brihana dravya : prithvi + jala
- Vata shaman : prithvi + jala+ teja
- Pitta shaman : prithvi+jala+vayu
- Kapha shaman : aakasha+teja+vayu.. And so on

The descriptions of these five constituents are quite similar across Mahabharata, Nayaya Darshana, Vaishai-shik darshana, Sankhya, Kashmir shaivism, Tantra and Buddhist philosophy, Greek Stoic texts and even Vishnu iconography.

#### Mahabharata:

भूमेः स्थैर्यं गुरुत्वं च काञ्चिं.....  
चैव भूतानां विकृतिनिच महाभारत शात्तिपर्वाध्याय  
(255)

Here, bhautik guna and mansika guna are described which implies that sharira is constituted of bhoota, therefore, person having more of prithvi bhoota has more dhyeya, having jala bhoota is saumya, having agni bhoota possess shoka, raaga, and having vayu bhoota are bali and swantantrata priye.

It is profitable (*profiter* as the French say) to compare a variety of interpretations to discover the underlying meaning. The principle sources that we rely on are Sri Aurobindo's interpretation based on Sankhya, Arthur Avalon's interpretation based on Tantra, J.C. Chatterji's presentation of Kashmir Shaivism, the Buddhist presentation as given in the Vasubandhu's Abhidharmakosa, as well as extant Greek Stoic texts. As we see, there is remarkable convergence in all these interpretations.

*“An ocean of electric Energy  
Formlessly formed its strange wave-particles  
Constructing by their dance this solid scheme,  
Its mightiness in the atom shut to rest;  
Masses were forged or feigned and visible shapes;  
Light flung the photon's swift revealing spark  
And showed, in the minuteness of its flash  
Imaged, this cosmos of apparent things.  
Thus has been made this real impossible world,  
An obvious miracle or convincing show.”*

(Sri Aurobindo, Savitri, Book II, Canto 5)

**Sankhya perspective as given by Sri Aurobindo**  
The following text is culled from a few sources (1, 2, 3, 4) in which Sri Aurobindo expounded his interpretation of the five elements:

1. **Ether or Akasha:** The elementary state of material force is, in the view of the old Indian physicists, a condition of pure material extension in Space of which the peculiar property is vibration typified to us by the phenomenon of sound.

2. **Air or Vayu:** Vibration in the state of ether is not sufficient to create forms. There must first be some obstruction in the flow of the force ocean, some contraction and expansion, some interplay of vibrations, some impinging of force upon force so as to create a beginning of fixed relations and mutual effects. Material force modifying its first ethereal status assumes a second, called in the old language the aerial, of which the special property is contact between force and force, contact that is the basis of all material relations. Furthermore, he said that it is this principle, Vayu, which is the support of all contact and exchange, the cause of gravitation and of the fields (magnetic and electric).
3. **Fire or Agni:** Ether and air do not beget real forms but only varying forces. A sustaining principle is needed. This is provided by a third self-modification of the primitive force of which the principle of light, electricity, fire and heat is for us the characteristic manifestation. Fire is threefold: ordinary fire(Jala Agni), electric fire(Vaidyuta Agni), solar fire (Saura Agni).
4. **Liquidity or Apas:** Even with the above three, we can have forms of force preserving their own character and peculiar action, but not stable forms of matter. A fourth state characterised by diffusion and a first medium of permanent attractions and repulsions, termed picturesquely water or the liquid state.
5. **Earth or Prithvi:** There is then a fifth state which is needed for cohesion, termed earth or the solid state, and this completes the necessary elements.

All forms of matter of which we are aware, all physical things even to the most subtle, are built up by the combination of these five elements. Upon them also depends all our sensible experience; for by reception of vibration comes the sense of sound; by contact of things in a world of vibrations of force the sense of touch; by the action of light in the forms hatched, outlined, sustained by the force of light and fire and heat the sense of sight; by the fourth element the sense of taste; by the fifth the sense of smell. All is essentially response to vibratory contacts between force and force. In this way the ancient thinkers bridged the gulf between pure force and its final modifications and satisfied the difficulty which prevents the ordinary human mind from understanding how all these forms which are to his senses so real, solid and durable can be in truth only temporary phenomena and a thing like pure energy, to the senses non-existent, intangible and almost incredible, can be the one permanent cosmic reality.

#### Kashmir Shaivism

Kashmir Shaivism was founded by Abhinav gupta in the 8<sup>th</sup> century. Here, we will focus solely on its exposition

of the five elements as provided in J.C. Chatterji's book "Kashmir Shaivism" (5). What follows is a brief summary from that book.

There are five factors that constitute what may be termed the "materiality of the sensible universe":

1. The principle of Vacuity (Avakasha), technically "Akasha" and literally the sky, the bright shining firmament. This is nothing but "Dishah" or directions the lines of force radiating everywhere. These lines are symbolized as the "hairs" of Shiva who is therefore called vyomakesha (he whose hairs are made of vyoman, vyoman is a name for both space and direction). It is these lines of force which uphold all things in the universe in their various positional relations. The simile of all space and indeed the whole universe, being thus woven like a cloth is encountered several times in the veda.
2. The principle of aeriality, technically "Vayu" and literally air or the aerial atmosphere. Vayu is required in order to create variation in the uniform and homogenous "temperature" created by akasha (Ether).
3. The principle of what may be called formativity. i.e. the formative or form building principle, technically "Agni" and literally fire. In the varied play, some power is needed which produces, transforms and destroys forms. This burning and flaring up into various shapes and forms is called agni or fire.
4. The principle of liquidity, technically "api" and literally water.
5. The principle of solidity or stability, technically called the prithivi or dharanitattva, literally Earth.

**Darshana perspective :** Vedanta darshana's acharya vidyaranya swami has mentioned about panchmahabhoota in his book "Panchdashi". Here only bhoota word is used.

- Acharya vishavanath panchanan of nyayavaisheshik has also described the gunas of various panchmahabhoota, like vayu having sparsh, sankhaya, parimaana, etc. guna, tej having roopa, vega etc, eleven guna, jala having roopa, rasa, sneha, etc, fourteen guna, prithvi also having fourteen guna (except sneha possesses gandha guna), akasha having shabad, etc, five guna.

स्पर्शादयोऽप्यै वेगाख्यः.....

कालदिशो शब्दश्च ते च खे ॥

(मुक्तावली कारिका 30-33)

### Tantra perspective

The British orientalist Sir John Woodroffe (Arthur Avalon) elucidated the Tantra perspective on the five elements in his book "Serpent Power" (6). The following passage is excerpted from the book: "...there are certain motions or forces (five in number) which produce solid matter, and which are ultimately reducible to ether (Akasa)...Akasa is one of the gross

forces into which the Primordial Power (*Prakriti Sakti*) differentiates itself. Objectively considered it is a vibration in and of the substance of *Prakriti* of which it is a transformation in which the other forces are observed to be operating....At the back of both "matter" and mind, there is the creative energy (*Sakti*) of the Supreme who is the cause of the universe and Consciousness itself. Matter affects the *Jiva* (soul) in five different ways, giving rise in him to the sensations of smell, taste, sight, touch and feel, and hearing.... From the *Sabda-Tanmatra* and from the combinations of the latter with the other *Tanmatras* are produced the gross *Bhutas* (*Mahabhuta*), which as things of physical magnitude perceivable by the senses approach the Western definition of discrete sensible "matter". These five *Mahabhutas* are *Akasa* (Ether), *Vayu* (Air), *Tejas* (Fire), *Apas* (Water) and *Prithvi* (Earth). Their development takes place from the *Tanmatra*, from one unit of that which is known in sensible matter as mass (*Tamas*), charged with energy (*Rajas*) by the gradual accretion of mass and redistribution of energy. The result of this is that each *Bhuta* is more gross than that which precedes it until "Earth" is reached. These five *bhutas* have no connection with the English "elements" so called, nor, indeed, are they elements at all, being derived from the *Tanmatras*. Dynamically and objectively considered they are (proceeding from *Akasa*) said to be five forms of motion, into which *Prakriti* differentiates itself:

1. **Akasha:** non-obstructive, all-directed motion radiating lines of force in all directions, symbolized as the "Hairs of Siva" affording the space in which the other forces operate;
2. **Vayu:** transverse motion and locomotion in space.
3. **Agni:** upward motion giving rise to expansion.
4. **Apas:** downward motion giving rise to contraction.
5. **Prithvi:** that motion which produces cohesion, its characteristic of obstruction being the opposite of the non-obstructive ether in which it exists and from which it and the other *Tattvas* spring.

....These *Bhutas* (elements) when compounded make up the material universe....Matter, thus exists in the five states etheric, aerial, fiery, fluid, and solid. *Prithvi* does not denote merely what is popularly called "Earth". All solid (*Parthiva*) odorous substance is in the *Prithvi* (earth) state. All substance in the fluid (*Apya*) state is in the *Apas* (liquid) state, as everything which has cohesive resistance is in that of *Prithvi*. This latter, therefore, is the cohesive vibration, the cause of solidity, of which the common earth is a gross compounded form. All matter in the aerial (*Vayava*) condition is in the *Vayu* state. These are all primary differentiations of cosmic matter into a universe of subtly fine motion."

Avalon further adds that "according to Western notions, it is the air which is the cause of sound. According to Indian notions, Ether is the substratum (*Asraya*) of

sound, and Air (Vayu) is a helper (Sahakari) in its manifestation.” (6)

Buddhist perspective presented by Vasubandhu Vasubandhu (4<sup>th</sup> C.E) was a prominent Buddhist philosopher. The Buddhist interpretation of the elements is taken from his book Abhidharmakosa. Yasomitra wrote a commentary called Sphutartha Abhidharmakosa-vyakhya on the Abhidharmakosa. Among the recent books expounding on this scripture are Sukomal Chaudhuri's Analytical Study of Abhidharmakosa and Louis De La Vallee Poussin's Abhidharmakoshabhasyam.

The four elements are discussed in verses 11-13 of Chapter 1 called “Dhatunirdesa” in the Abhidharmakosa. It is noteworthy that the elements are referred to as Forces rather than Matter. Also note that unlike the other systems, Vasubandhu discusses only four rather than five elements. He states:

1. Earth provides Supporting Force
2. Water provides Cohesion Force
3. Fire provides Ripening Force
4. Air provides Expanding Force

Chaudhuri presents Yasomitra's commentary in his book:

“Yasomitra explains how these great elements are interdependent. If we analyse any one of these elements, say earth, we will observe that together with the atoms of earth it contains at least one atom, if not more, of water, fire and air. But as the atoms of earth predominate here, we call it earth. Thus, though the great elements (Mahabhutas) arise together, in all molecules, hard, moist, hot or mobile, for the time being the nature of one predominates and our senses notice only the predominating one and not the others. We, therefore, say: this is earth; this is water; this is fire; this is air. So each and every material object is the combination of the four great elements. Even the derivative material dharmas(laws) of the Rupaskandha (matter aggregate) are nursed by the four great elements as an infant prince is fed, bathed, dressed and fanned by others. (7)

### Greek Stoic philosophy

The Stoic school of philosophy in Greece was started by Zeno under a porch (i.e. Stoa). There are several noteworthy similarities between the Indian philosophies and the Stoic philosophy, as pointed out by McEvelley in his book (8). The couple of passages below from extant Stoic scriptures pertain to the five elements: God, Intelligence, Fate, and Zeus are all one, and many other names are applied to him. In the beginning, all by himself, he turned the entire substance through air into water. Just as the sperm is enveloped in the seminal fluid, so God, who is the seminal principle of the world, stays behind as such in the moisture, making matter

serviceable to himself for the successive stages of creation. He then creates first of all the Four Elements: fire, water, air, earth. (Diogenes Laertius 7.135-6) The world, they hold, comes into being when its substance has first been converted from fire through air into moisture, and then the coarser part of the moisture has condensed as earth, while that whose particles are fine has been turned into air, and this process of rarefaction goes on increasing till it generates fire. Thereupon out of these elements animals and plants and all other natural kinds are formed by their mixture (Diogenes Laertius 7.142)

Although the ordering of the elements is a little different, the process resembles the other systems that we have seen above: there is a modification of the primordial substance with fire converting into air, then water and finally into earth.

### Vishnu iconography

In the Vaishnavite tradition of Hinduism, Vishnu is supposed to be the Supreme and he is said to have had four expansions (*Chatur-Vyuha*) : Vasudeva, Sankarsana, Pradyumna, Aniruddha, as per the Kurma Purana, Agni Purana (48.13) and Vishnu Purana (V.18.58) (9). The Garuda Purana goes a step further and refers to the five forms of Vishnu (*Pancha-tatvarchana*) Vasudeva, Sankarsana, Pradyumna, Aniruddha and Narayana (9). In a conversation recorded in 1910, Sri Aurobindo spoke of the “divine principle, enmeshed in a quadruple sheath of Vasudeva, Sankarshan, Pradyumna and Aniruddha” (10). The Shanti Parva of the Mahabharata alludes to this transformation as well: ..... When He (Vishnu) becomes Jiva, He comes to be called Sankarshana. Next, He transforms Himself into Pradyumna and then into Aniruddha. In this way, the high-souled Krishna, who has Himself for His origin divides (or displays) Himself in fourfold form. Desirous of creating this universe which consists of the fivefold primal elements. (11)

These names seem to have been chosen with care, because their Sanskrit meanings indicate a connection to the five elements discussed above:

1. *Vasudeva* is “that in which all things abide”, indicating the element Ether.
2. *Sankarsana* indicates “squeezing together.” [*Samyak* (complete) + *Akarshan*(attraction)], indicating the element of Aeriality.
3. *Pradyumna* means the “radiant one”, indicating the element Fire.
4. *Aniruddha* in Sanskrit means “without obstacles”, indicating liquidity or Water.
5. *Narayana*: In Sanskrit, another name for water is *Nara* so *Narayana* means “one who floats on Water”, which is the previous element. Hence, *Narayana* probably indicates Earth.

Thus these expansions of *Vishnu* seem to have a correspondence with the five elements. The *chatur-vyuha* (four expansions) of Vishnu was later defined and became the basis for Vishnu iconography. Based on these expansions, the *Pancharatra* theology within Vaisnavism developed four-headed idols of Vishnu (called *Chatumurti-Vishnu*) which came to be worshipped in temples. You can see some of the idols at the links given below. This is an outstanding example of how cosmological insights of sages were transformed into external forms of worship suitable for the masses !!

Sri Aurobindo said that Vayu is the “support of all contact and exchange, the cause of gravitation and of the fields (magnetic and electric)”. This concept bears close resemblance to the four forces strong nuclear, weak nuclear, electromagnetic and gravity that modern physics seeks to integrate into a unified theory.

In 1989, John Hagelin, a particle physicist and Director at the Maharishi University of Management, claimed that there is a striking correspondence between these five tanmatras and the five quantum-mechanical spin types of a unified quantum field theory (12). He proposed the following parallels:

- Between the *akasha* or “space” and the gravitational field;
- Between the *vayu* or “air” tanmatra, which stands as a link between space and the other tanmatras, and the gravitational field;
- Between the *tejas* or “fire” tanmatra, responsible for chemical transformations and the sense of sight, and the spin-1 force fields;
- And between the *apas* and *prithivi* (“water” and “earth”) tanmatras and the spin-1/2 and spin-0 matter fields, respectively.

## Conclusion

The crux of above said is that the panchmahabhoot is a uniform entity which is present everywhere or can say either ways that everything is composed of them only, whether in Suksham form or Sthulaform. Hereby, have derived from different shastras like Vishnu iconography, darshan, tantra that panchbhoot is one of the basic siddhanta of all and proves out to be a sarvatantra siddhanta as it is mentioned and world wide accepted by all literature

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# UDARMARMA- A CRITICAL REVIEW

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## ABSTRACT

Marma vigyana is like an ocean full of knowledge of vital points, their ayurvedic and modern anatomy and its applied aspect in relation to traumatology and internal medicine. The marmas are certain vital areas of the body which are defined as complex anatomical sites, where a definitive physiology rests & produces specific traumatic results. Even a partial injury to vital spot could entail death or any complication, and injury to the neighbouring part by cutting, breaking, trauma, burning and tearing also give features similar to those of marma, so a surgeon has to consider their location and measurements carefully before carrying out surgical procedures. This paper highlights each of udarmarma anatomically, according to ayurveda, with their modern correlation and try to conclude their fatal response to trauma.

## INTRODUCTION

The concept of marma sharir was very important to kings and warriors of ancient times. The knowledge of marma was applied while fighting with enemies to inflict fatal injury on enemy body, so that war may be won easily by inflicting maximum fatal injury against enemy. In modern centuries the main aim to know marma sharir is to protect them from injuries.

The word marma comes from Sanskrit origin mru or marr, which means "to kill". These are vulnerable points on human body surface on which any kind of trauma may cause death or disability. Marma means prana, jiva or life and is constituted by confluence of mamsa, sira, snayu, asthi & sandhi<sup>1</sup>. This signifies the importance of place where all five living surgical tissues are present. In other words marmas are vital points of body & seat of life and energy. These are the seat of soma, vayu, teja, raja, tama & jeevatmaa, known as jeevasthanana and pranayatana<sup>2</sup>. Saptotram marmshatm i.e. 107 marmas are classified into 3 sections in terms of structure<sup>3</sup>, region<sup>4</sup> and prognosis<sup>5</sup>.

Structure		Region		Prognosis	
Type	Number	Type	Number	Type	Number
Mamsa	11	Shakha	44	Sadyahapranhar	19
Sira	41	Urah	09	Kalantarpranhar	33
Snayu	27	Udar	03	Vishalyaghana	03
Asthi	08	Prishth	14	Vaikalyakar	44
Sandhi	20	Urdhavjtru	37	Rujakar	08

## UDARMARMA

The three udarmarma are named as guda, vasti & nabhi, each one in number. These are sadhyapranhar in prognosis. Each marma is of 4 anguli (mushtika) in parimana<sup>6</sup>.

प्रकार	संख्या	लक्षण	रचना	परिमाण	परिणाम
गुद	01	वातवर्चोनिरसनं स्थूलान्त्रप्रतिबद्धं गुदं	मांस/धमनी	मुष्टिका (4अं)	सद्यः प्राणहर
वस्ति	01	अन्यमांसशोणितोऽभ्यन्तरतः कट्यां मूत्राशयो वस्तिर्नाम	स्नायु	मुष्टिका (4अं)	सद्यः प्राणहर
नाभि	01	पक्वामाशयोर्मध्ये सिराप्रभवा नाभिर्नाम	सिरा	मुष्टिका (4अं)	सद्यः प्राणहर

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### Guda

Sushruta explained guda as mamsa marma that eliminates flatus and faeces & is attached to the large intestine and injury to this causes death. In ancient literature guda is described anatomically and physiologically as bahirmukha, mahachhidra, mahasrotas, pranayatan, jivasthana, mahayan, karmendriya, koshtanga, dhamni marma (Vagbhata)<sup>12</sup>. Kashyap used the term mahamarma & said that it is situated near kundilini.

The anal canal and rectum are considered as guda marma. The other important structures such as external sphincter ani, internal sphincter ani, levator ani, inferior haemorrhoidal nerve plexus and vessel can be considered as contents of guda marma.

### Vasti

Vasti is the snayu marma, is thin membranous organ, covered with a network of sira & snayu having single opening which is directed downwards, shape of vasti is mentioned like that of alabu (gourd) by Sushruta & dhanurvakra by Vagbhata. Vasti has less mamsa & rakta and acts as reservoir of urine. It is also termed as mutravaha srotasa and pranayatana.

Urinary bladder is considered as the vasti marma.

### Nabhi

Nabhi is a Sira marma situated between intestine & stomach which is the seat of origin of siras which leads to immediate death on injury. Sushruta described that whatever the Siras are in the body, they are all attached to nabhi from where they spread all around. Pranas of living beings stay in nabhi and nabhi is dependent on pranas. Nabhi is surrounded by siras in the same way as the nave of the wheel is surrounded by spokes.<sup>11</sup> It is also described as prana, pranayatan, jivasthan & sthana of pran vayu. Channels of annavahasrotas, rakthavaha Srotas, medavaha Srotas, pachak & ranjak pitta, sman vata & manipura chakra is also present here. Umbilicus or entire umbilical region is taken under consideration as nabhi marma. All important structures such as peritoneum, muscles of anterior abdominal wall, abdomen proper (gastrointestinal tract, pancreas, spleen, liver, kidney, major blood vessels, abdominal aorta, inferior vena cava, celiac trunk, nerve plexus) are situated at nabhi pradesha.

### Clinicosurgical Importance of Udarmarma

Giddiness, delirium, fainting, delusion loss of activity of body parts, fainting, increased expirations, severe pain caused by vata, blood resembling mutton wash flowing out, (mamsodakabhm rudhirm), cessation of activity of all the sense organs are common symptoms when all the five vital spots (muscle, vein, tendon, bone & joint) are injured.<sup>7</sup>

Marmas are classified into 5 groups in reference to their fatal results<sup>8</sup>:-

Sadhyaha Pranha	Aagneya
Kalantar Pranhar	Aagneya + Somya
Vishalyaghan	Vayvaya
Vakalyakara	Somya
Rujakar	Aagneya + Vayvaya

Marma belonging to sadhyahapranhar group are considered aagneya in nature. An injury to marma is attended with the imperfection of sense organs, loss of consciousness & various types of pain. Trauma is still the most frequent cause of death in first four decades of life, and it remains a major public health problem in every country regardless of the socioeconomic development. The abdomen is the third most common injured region, with surgeries required in 25% of civilian cases. The causes of trauma are many and varied.

Rectal injuries can result from pelvic trauma, ingestion of a foreign body for diagnostic & therapeutic procedures, autoeroticism etc. A brush or neon light can cause injury in patients. Trans-anal high hydrostatic pressure may cause severe injuries. Enema procedures may cause injuries to guda. Anatomically, haemorrhoidal veins being tributaries of the portal veins having no valves, therefore are delicate and hence care must be taken to protect them. Even P\R examination is done very gently otherwise shock may occur.

Injury to vasti marma also results in immediate death, except a wound formed during extraction of a calculus. A calculus wound also proves fatal if it is present on both sides. If there is injury only on one side a wound is formed through which urine oozes out. Such wound may be closed and healed if it is treated with great care.<sup>9</sup> The urinary bladder is in close contact of peritoneum, when it gets injured even by blunt trauma in peritoneal cavity & cause peritonitis and ultimately proves fatal. An injury to the urinary bladder leads to difficulty in survival of the patient. Full bladder injury may lead to neurogenic shock where instant death occurs. Sushruta has explained not to injure bladder during extraction of stone. Patient with calculi whose bladder has been torn into two never get well.<sup>10</sup>

Nabhi marma is seat of major organs and blood vessels, during trauma it may lead to damage of visceral organs resulting in respective manifestations, which require medical aid or patient may succumb to death. Cause of death may be internal haemorrhage or shock which may lead to death. Rapid bleeding injuries from major vessels cause hypovolemic shock. Injury to organs may lead to peritonitis and may eventually cause death due to septic shock.

**CONCLUSION**

Sushrut has suggested that the knowledge of anatomy and physiology is essential for the exact study of surgical problems by Ayurveda surgeons. Marmas are said to cover half of the jurisdiction of surgery because persons die immediately if marmas are injured; even if some of them survive due to surgeon's efficiency, they definitely become victim of disability.

Abdominal trauma is the major cause of mortality, it is important for a surgeon or physician to know the important structures that are extremely vital and special consideration is to be taken while performing any surgical procedure like ksharkarma, agnikarma, siravedh, vishprayoga, because a person even with torn and mutilated trunk and skull, body parts injured with weapons or leg, arm, foot and hand severed completely can survive if injuries are not inflicted on marmas<sup>13</sup>.

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