



GERIAYUTRICS – AYURVEDIC PERSPECTIVE OF SENESCENCE AND REJUVENESCENCE

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ABSTRACT

Ayurveda itself is seen to have been evolved to ease human beings from *Jara*. Inclusion of *Jara chikitsa (Geriayutrics)* as one among the *Ashtanga Ayurveda* during those good olden days implies the foresight of *Acharyas* on its importance. World Health Organisation declared the calendar year 1999 as the International Year of Older People (IYOP), since then the problems of aging people got the worldwide focus and health wise momentum. Now at this time, the whole world is showing renewed interest in the aging process and aged people. In first 50 yrs of 21st century old age dependency ratio is expected to double in more developed region and triple in less developed region, thus the aged people are going to be a big problem for the society. It is the best time to explore the possibilities from *Ayurveda*, which can raise the hope of the silver population and improve their lifespan. The cognate of the Greek "*Geras*" is the Sanskrit "*Jara*" both of which means old age. According to *Ayurveda*, the *Jara* (aging) is a natural phenomenon like hunger, thirst and sleep. Sushruta mentioned a group of naturally occurring diseases named *Svabhavabala roga*, which includes *Kshut* (hunger), *Pipasa* (thirst), *Nidra* (sleep), *Jara* (old age) and *Mrityu* (death). The term "*Geriayutrics*" is introduced by the authors to emphasize that *Ayurveda* is the science recognised importance of *Jara Chikitsa* as separate clinical speciality. This review focuses on the understanding of *Ayurvedic* biology of aging with respect to physiological components such as *Dosha*, *Dhatu*, *Mala*, *Srotas*, *Indriyas*, *Ojas*, *Manas* and so on and their correction through the application of *Rasayana* (rejuvenescence).

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INTRODUCTION

Biology is the science of life. Life is indefinable according to biological sciences, as time and space are indefinable in physical sciences, whereas *Ayurveda* being the holistic science explained *Ayu* in detail encompassing the philosophy, art and science of life. *Ayurveda*, one of the most ancient medical sciences of the world was evolved through intuitive, experimental and perceptual methodology. The main objective of *Ayurveda* is to promote health and thereby preventing the ailments and to relieve the humanity from all categories of miseries i.e. physical, mental, intellectual and spiritual. *Ayurveda* conceives life as a four dimensional entity. *Ayu*, the living entity is the sum total of *Sharira* (Body), *Indriya* (Senses), *Satwa* (Psyche) and *Atma* (Soul). It is the constant and continuous union and conjunction of *Sharira*, *Indriya*, *Satwa*, and *Atma*. The synonyms of *Ayu* are *Nityaga*, *Dhari*, *Jeevitam* and *Anubandha*. *Nityaga* signifies continuation of consciousness. *Dhari* means the factor that prevents the body from decay. *Jeevitam* represents the act of keeping alive. *Anubandha* means which transmigrates from one body to another. These four components of *ayu* interplay the human body.^{[1][2]} Out of

which *Atma* is supreme entity, immune to cycle of birth, disease and death (*Nirvikara parastu atma*). So other three components of *Ayu* are important to understand the basic biology of *Jara* then only the deviations from the normalcy can be corrected. A look into these factors governing the normal functioning will provide an insight into the cause of their deterioration.

Objectives

The main objective of the article is to focus the *Ayurvedic* biology of aging in contemporary understanding. Knowledge regarding senescence and rejuvenescence scattered in different *Ayurvedic* Samhitas at different contexts. All these related points were arranged in a systematic and understandable manner.

Sharira (Body matrix)

Sharira is the grossest component of *Ayu*, which is made up of five *Mahabhutas* and is the abode of mind and consciousness.^[3] It forms the metaphysical basis of life. *Dosha dhatu mala mulam hi shariram* is the dictum of *Ayurveda*.^[4] The body matrix is indeed an important concept of *Ayurveda*. Life in *Ayurveda* is conceived as the

union of body, senses, mind and soul. The living man is a conglomeration of three humours (*Doshas* – *Vata*, *Pitta* & *Kapha*), seven basic tissues (*Dhatu* – *Rasa*, *Rakta*, *Mansa*, *Meda*, *Asthi*, *Majja* & *Shukra*) and the byproducts of the body (*Mala*) such as *Mala* (faeces), *Mutra* (urine) and *Sweda* (sweat).^[5] Thus the total body matrix comprises of the humours, the tissues and the byproducts of the body. The growth and decay of this body matrix and its constituents revolve around food, which gets processed into humours, tissues and wastes. Ingestion, digestion, absorption, assimilation and metabolism of food have interplay in health and disease, which are significantly affected by psychological mechanisms as well as by bio-fire. Health or sickness depends on the presence or absence of a balanced state of the total body matrix including the balance between its different constituents. Both the intrinsic and extrinsic factors can cause disturbance in the natural balance giving rise to disease and this very concept of *Ayurveda* is further supported by the various *Ayurvedic* treatments. *Srotomayam hi shariram - Srotoses* are also forms the components of body matrix, which takes the responsibility of interconnections in between the *Jeevaparamanus* i.e., *Dosha*, *Dhatu*, *Mala*, *Indriyas*, *Satwa* and *Atma*.^[5]

Aging & Tridosha

Ayurveda named *Vata*, *Pitta* and *Kapha* as *Tridosha*, and are recognized as being fundamental to all life and are seen in the processes of growth, maintenance, and decay. Their actions are named anabolism, metabolism, and catabolism in the western sciences. By the physical and functional attributes of these *Tridosha*, they can be conceived as Bio-dynamic forces, and are found in our environments at every moment on every level. When people become aware of these qualities within themselves, they take the first step toward creating a healthy life. *Ayurveda* assists in identifying these energies in a person's body and shows them how to more fully experience these gifts and gain freedom from their limitations. By working with the body's unique nature, true health can be created. Modern science conceives cell as structural and functional unit of Life. *Ayurvedic* units of life i.e., the bio-dynamic forces *Tridosha* even can be traced at cellular level.^[6] In childhood, anabolism and the *Kapha* elements are predominant, since this is the time of greatest physical growth. In adulthood, metabolism and the element of *Pitta* are most apparent, because at this stage the body is matured and stable. In old age, catabolism and *Vata* are most in evidence, as the body begins to deteriorate. A balance among the *Tridosha* is necessary for health. For example, the air principle *Vata* kindles the bodily fire *Pitta*, but watery portion *Kapha* is necessary to control fire, otherwise the bodily fire would burn the tissues. *Vata* moves, whereas *Kapha* and *Pitta* are immobile. Together, the *Tridosha* governs all metabolic activities. When *Vata* is out of balance, metabolism will be disturbed, resulting in excess catabolism, which is the breakdown or deterioration process in the body. When anabolism is greater than catabolism, there is an increased rate of growth and repair of the organs and

tissues. Excess *Pitta* disturbs metabolism, excess *Kapha* increases the rate of anabolism and excess *Vata* creates emaciation (catabolism).^[7] The physiological *Sleshma* holds the responsibility of the following functions which are mainly deranged in the cases of *Jara* due to *Kapha kshaya - Ambu karma/ Upalepa Sandhibandhana/ Brimahana/ Purana/Snehana*. The six factors responsible for *Parinama* of *Ahara* viz, *Ushma*, *Vayu*, *Sneha*, *Kleda*, *Kala* and *Samyoga* are deranged in old age.^[8] The homeostatic *Agni* holds the responsibility of the following functions which are mainly deranged in the cases of *Jara* due to *Vishamagni - Ayu / Varnya/ Bala / Swasthya/ Utsaha / Upachaya / Prabha / Ojas / Tejas / Prana*.^[9] Prof. R.H. Singh postulated the *Doshic* set up in aging^[10] and the same is shown in [Table 1].

Aging & Saptadhatu and Srotodushti

The second component of *Sharira* is *Dhatu*. "*Heeyamana dhatu*" is the typical feature of old age. After review of *Dosha*, it is essential to discuss the *Sapthadhatu*, the structural components of the body which are directly victims of the constant interplay of the *Tridosha*. They help in maintenance; bearing, sustenance and nourishment of the human body. The *Srotas* of each *Dhatu* are unique in their structure and function and in the materials which move through them.^[11] Due to *Vikrita Vata*, *Vishamagni* and *Ksheena Kapha*, the *Adidhatu*, *Rasa* itself is malformed and does not perform its function of "*Preenana*" to the rest of *Dhatu*s and in turn to the total body.^[12] This leads to sequential weakening of the *Dhatwagnis* at the *Saptadhatu* level ultimately leads to *Dhatukshya*. This emaciated condition generally identified with aging i.e., "*Ksheeyamana dhatu bala indriya*" Leaving just a bony cage of a body devoid of replenished tissue elements. This is described by *Susruta* as "similar to a rumbling house collapsing with the onset of rain."^[13] Therefore, the *Apraenana Rasa dhatu* sets off a chain of malformations of successive *Dhatu*s. As the *Prasada paka* and *Kitta paka* are improper, even the *Upadhatus* and *Dhatumalas* are malformed. This qualitative and quantitative *Kshaya* leads to the *Ksheena lakshanas* being found in the aged individual leads to *Kasaswasadi upadrava*.^[14] Since in *Ayurveda*, the diseases occurring in Old age have not been separately enumerated, the *Adi sabda* has been interpreted to encompass all the geriatric problems starting from *Kasa swasa* of *Pranavaha srotas* to the remaining all the *Srotoses*.^[15]

Aging & Bala / Ojas

Health and longevity depends on the *Bala*.^[16] *Bala* denotes two vital aspects of life processes namely *Vyayama shakthi* (Physical strength) and *Vyadhi kshamatwa shakthi* (Inherent immunity). *Charaka* classified *Bala* into three categories - *Sahaja bala* (Inherent resistance) -Individuals with *Sahaja bala* enjoys prolonged youthfulness and they will not be suffered by the problems of aging. *Kalaja bala* -This type of *Bala* is influenced by the factors like seasonal variations and age of the individual. By the age, in *Vridhdha* the status of *Bala* is of *Madhyamavastha / mediocre*. If the same is coincides with season i.e., of

Adana Kala the rate of aging will precipitated. So adoption of *Ritu charya* (seasonal regime) is beneficial. *Yuktikrita bala* - This type of *Bala* refers to the induction of body's resistance by resort to appropriate nutrition and other therapeutic methods. Adoption of *Swastha vritta*, *Achara rasayana* principles and *Rasayana*, *Vajikarana dravya prayoga* promotes *Yuktikrita bala*.^{[17][18]} The entire body, with its limbs and organs is permeated with *Ojas*, in the absence or deficiency of *Ojas* causes wasting, decay, degeneration and destruction.^[19] As the decay and degeneration of *Sapta dhatus* is the cardinal sign of *Jara*, it employs the involvement of *Ojas* in aging. *Sushruta* under the heading of *Ojo vikriti* discussed different conditions seems to be similar to geriatric pathology viz., *Ojo visramsya* (reflects Immuno compromised status), *Ojo vyapath* (reflects Auto immune disorders) and *Ojo kshaya* (reflects Immuno deficiency disorders).^[20]

Aging & Trimala

In addition to the *Doshas* and the *Dhatus* there is one more constituent of the body named as *Malas* or the byproducts of the metabolism. The chief *Malas* are *Mutra* or urine, *Shakrit* or faeces and *Sweda* or sweat. Other *Malas* can be named as *Pitta*; *Purisha sneha* or faecal fat; *Prajanan malas* or secretion of the genitalia; and *kha Malas* or secretions of the various orifices of the body such as the ear, nose, mouth, and so on. *Malas* play a supporting role while they are in the body. They are eliminated once their supporting role is finished. In the conditions of *Dhatukshaya* like *Rajayakshma*, *Jaraja soshya* etc., *Mala* holds the function of strength. In other words *Purisha* is only the strength to the *Dhatukshaya* persons.^[21]

Aging & Indriyas

Having dealt with the first components of *Ayu* i.e., *Sharira* and its *Vikriti*, the implications of Age upon the *Indriyas* are considered here under. The term "*Indriya*" is defined as '*Lingamindrasya*' - the sign of life.^[22] *Manas* is the controller of *Indriyas*, and *Manas* in turn regulated by *Vata*.^[23] It implies that *Indriyas* are regulated by *Vata* via *Manas*. In *Vridhdhavastha* physiological aggravation of *Vata* affects the normal functioning of *Indriyas*. The role of *Vata* in the interplay of *Indriyas* is evidenced by the functions like *Sarvedriyarthabhivahana*, *Sarvendriya yojana* and *Indriya tarpana* etc., and its pathological influence in relation to Aging is also mentioned under the heading of *Indriyapradoshaja vikara*.^[24] For example - *Sarvendriya sunyata* - Seen in *Pranavrita udana vata*; *Sarvendriya upaghata* in *Pranavrita vyana vata*; *Indriyavadha* in *Vata prakopa*; *Akshi glani* in *Mamsa kshaya*, *Indriya dourbalya* in *Pitta vridhhi* etc., *Indriyahani* is a prominent feature encountered in Geriatric patient. Therefore the roles of the *Doshas* in their maintenance and *Vikriti* have been considered.

Aging & Manas / Satwa

After review of *Sharira* and *Indriya*, the last governable component of *Ayu* - *Manas* or *Satwa* is being discussed. *Vata*, being the supreme controller of the body not only shows its influence at physical and physiological

level but also at psychological level i.e., it regulates the smooth functioning of *Manas* or Mind. As the key element of the body i.e., *Vata* is vitiated physiologically in *Vridhdhas*, it directly or indirectly disturbs the dual roles of *Manas* (*Ubhayatmaka*). *Manas* being the *Ubhayatmaka* work as relay station in between Cognitive and Conative organs, in other sense in between external and internal world. Ideally, the *Manas* should be *Satwapradhana* for it to gain the ability to sustain emotional assaults. Most of the psychiatric problems develop due to *Alpasatwa*. Charaka while enumerating the *Sukhayu lakshana* says "*Manasa roghabhyam anabhidritasya*".^[25] A glance through the maintaining factors and the *Hetu* of such *Vikara* as may hold sway over the senile mind, would throw light on the reason of its deterioration. Due to *Vata prakopa satwa* declines with age, leading to decrease in its normal powers of *Grahana*, *Dharana*, *Vachana*, *Smarana* and *Vijnana* and susceptibility to other *Vikaras* by the *Doshas* such as *Pralapa* due to *Vata*; *Manobhramsya* - *Udanakopa*; *Bhaya Shoka Dainya* - *Vata prakopa* etc., This accounts for the increasing incidence of dementia, delirium and depression with advancing age.^[26]

Aging & Homeostasis

The term for health in *Ayurveda* is '*Swasthya*'. This word means, to be established (*Sthya*) in oneself (*Swa*). Ayurvedic texts elaborate on the meaning of *Swasthya*: One whose physiological functions (*Doshas*), metabolism (*Agni*), bodily tissues (*Dhatus*) and excretory functions (*Malas*) are in a state of equilibrium with cheerful mind, clarity of intellect and contented senses is said to be established in oneself (*Svastha*). *Prasannata* denotes happiness and equipoise.^[27] Health or *Swasthya* is therefore defined by *Ayurveda* as a state of equilibrium of body and mind; in others words "A sound SMS (Senses Mind Soul) in a sound body". It is state of equilibrium of normal anatomical, biological, physiological, mental and spiritual well being. Hence *Sama* (balanced) state of *Dhatu*, *Dosha*, *Agni*, and *Mala* is the reflection of Homeostasis in *Ayurveda*. In holistic approach of *Ayurveda*, the body, mind and soul are the subjects for the consideration. These entities are represented in human body as *Sthula sharira* (corporal body), *Suksma sharira* (Astral body) and *Karana sharira* (causal body). If the above mentioned Homeostasis is maintained in the body then that will be leads to Healthy Aging (*Sukhayu*).^[6]

Theories of Aging

The cause of aging is not described clearly in *Ayurveda* however some point can be considered in its regard. According to *Ayurveda*, the *Jara* is a natural phenomenon like hunger, thirst and sleep. Charaka has mentioned the theory of natural destructions (*Swabhavoparamavada*). There is a causative factor for the manifestation of being but no cause is needed for their cessation, some of the view that inhalation of being is caused by the non effectiveness of the causative factor.^[28] There are many theories related to aging were proposed by researchers, but none of them is accepted as a "theory" in the sense of the "theory of gravity" or "theory of relativity".^[7] As the aging process is complex

phenomenon with multiple intervening factors for early aging or delayed aging, a single theory can't justify all the dimensions of the aging. The above discussion of aging at different levels i.e., *Shareera* (physical), *Indriya* (emotional), *Satwa* (psychic level) and their reflections on *Agni*, *Bala/Ojas* etc., and other factors like *Parinama*, *Sharira vridhdhikara bhavas*, *Garbhahinivrittikara bhava* interplay the process of early or delayed aging. So an attempt is made to correlate the Ayurvedic principles with modern theories of aging and named it as below.

Ayurvedic Integrated Theory of Aging (AITA)

It brings together parts of modern theories of Aging. To be summed up, the main manifestation of the aging process at the level of the intact organism is the disruption of the many regulatory processes that provide functional integration between cells and organs.^[6] Modern theories of aging and their corresponding Ayurvedic principles are shown in [Table 2].

Types of Aging

Jara is an inescapable part of life. In fact, it is the conglomeration of the richness of one's experience of living. *Jara*, the old age is of two types - *Kala Jara* (Timely old age) and *Akala Jara* (Early / Premature Aging). The former type of *Jara* i.e., *Kalajara* is *Swabhava* or *Sahaja* in nature, which is cherished by everyone. The latter type i.e., *Akalajara* is unnatural and untimely - a process, occurring ahead of time. This type of *Jara* induces a set of social problems, and mental agony terminating in social stigma.^[29]

Milestones of Aging

From the moment of conception, right into extreme old age, the human body undergoes considerable change in shape, size and composition. The most dramatic changes take place during the first fraction of life, in utero, but change is a continuous process and changes occurring in the latter half of the life span may have considerable impact on the physiology, pathology and pharmacology of the older individual. In Ayurvedic literature *Vaghbata*, *Sharangadhara* emphasized this progressive deterioration of bodily features decade wise thereby setting milestones of Aging,^[30] details shown in [Table 3].

Jara Panchanidana

Ayurveda explained general *Nidana* for all diseases, known by *Trividha Nidana* (Etiological triad).^[31] They are *Asatmendriyarthasamyoga* (Inappropriate use of sensory faculties - hyper/ hypo and misuse); *Prajnyaparadha* (wilful indulgence in unhealthy practices /intellectual blasphemy) and *Parinama* or *Kala* (seasonal effects). Present day mode of dietary and life styles for example night shifts, sedentary life styles, Intake of junk foods, calorific imbalance in the body etc., contributes to early aging changes in the body. This mode of *Nidana* is suitable to the *Akala jara* or premature aging. *Parinama* refers to abrupt environmental changes, which makes the body vulnerable to disease. *Parinama* or *Kala* also refers to the effects of time, and the natural physical transformation that are affected as time progresses. In short *Kala* or *Parinama* is defined as "being out of

harmony with the rhythms and cycles of Nature". The effect of time is bound to happen and is *Nishpratikriya* i.e., Unavoidable.^[32] However, if one adheres to certain modes of life, one can expect smooth sailing as stressed by *Chakrapani*, while commenting on whether lifespan of an individual is predetermined, he compared the human body to a *Ratha* (Chariot). The full life span of the *Ratha* is subject to its proper maintenance or lubrication, as well as the conditions of the roads it has to traverse. Otherwise it is bound to deteriorate early. He concluded that *Ayu* is not pre determined but it dependent on various endogenous and exogenous factors that interplay in the human body.^[33]

As the *Vata* is main culprit in all the *Jara vyadhis*, the vitiating factors of *Vata* also interplay the disease process of *Jara roga*. Main causes of *Vatavyadhis*.^[34]

1. *Avarana* - It is acute/ sub acute onset due to blockage of channels associated with other *Dosas*. No specific causes are mentioned. But secondary *Dhatukshaya* can happen after *Avarana*. This may be seen in early aging.
2. *Dhatukshaya* - It is a degenerative stage where *Vata* alone will be vitiated because of the dominance of *Vayu* and *Akasa mahabhuta*, it induces *Apatarpana Kriya* in the body and produces *Dhatukshaya*.

Specific Nidana - *Rasa Vaghbata* is the first author specifically mentioned the *Jara nidana* in his treatise named *Rasa Ratna Samucchya*. He documented five etiological factors for Senescence.^[35] In addition to five, *Kala* is mentioned as sixth factor in *Madhava nidana sesham*^[36] and the seventh causative factor mentioned by *Charaka*.^[37] They are as follows.

1. *Panthah* - *Margayasa* / Exertional activities
2. *Sheetam* - Consuming cold foods on routine and/or living in cold climate
3. *Kadannani* - *Alpahara sevana* / Under nutrition
4. *Vayovridhdhascha yoshitah* - Sex with Elderly women
5. *Manasa pratikulyatah* / *Manobhighatascha* - Psychological stress and strain
6. *Kala* - *Adana Kala* and Old age
7. *Gramyavasa dosha* - Urbanization

Jara samprapti

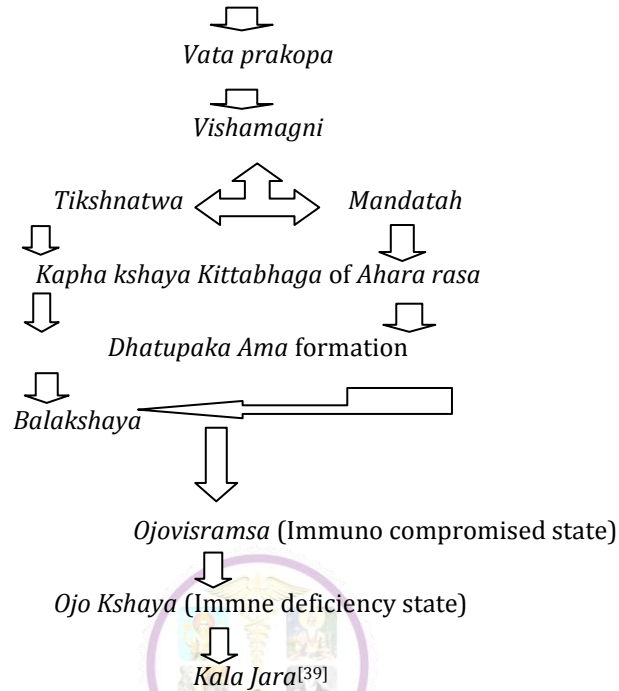
Samprapti of Kala jara - Dhatu kshaya

As *Vayu* is physiologically aggravated in the aged, it usually influences, among other things, the *Agni* as well. *Vata* is known for its *Vishamata* or erratic nature. On the same analogy, it can be inferred that in old age, which is under the influence of *Vata*, *Vishamagni* naturally prevails. *Vishamagni* in this context means the state of fluctuating *Agni*, moving in between hyper and hypo functional states (*Mandagni* & *Teekshagni*). In other words *Agni* which is not *Sama* is *Vishama*. Due to hypo functioning state of *Agni* (*Mandagni*), the resultant is the improper formation of *Ahara ras*, which undergoes putrefaction in due course, results in *Ama* formation. In modern sense this can be taken as 'free radical formation'. The formation of *Ama* disturbs the *Sara Kitta vibhajana* of *Annarasa* thereby resulting in *Mala-*

sanchaya, which in turn causes *Srotorodha/ Khavaigunya*. If the same is continued for longer duration even it leads to acute condition known as *Ama visha* (Auto intoxication). All the Auto immune disorders related to old age falls under this category. When *Vishamagni* tilts towards *Tikshnatwa*, it results in *Dhatu sosha*, since the proportion of food needed for tissue maintenance is

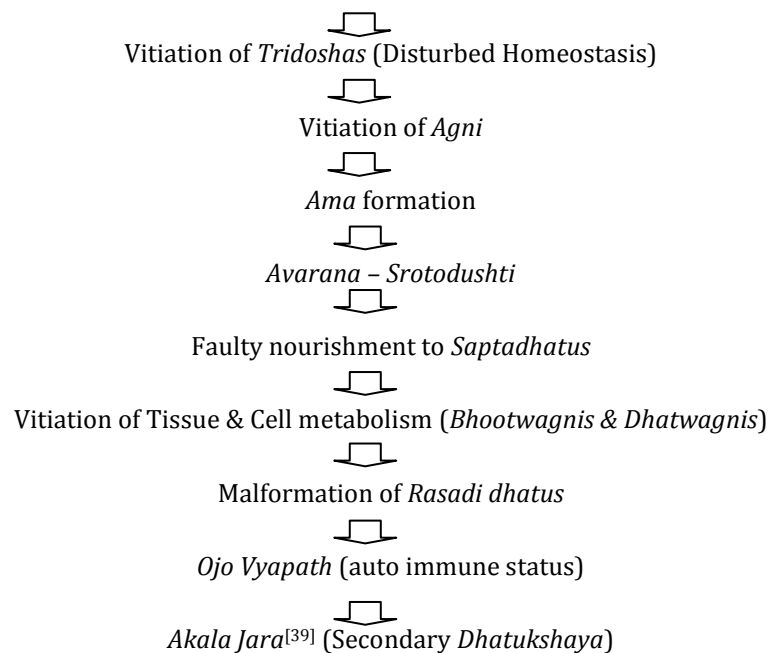
obviously burnt. This is a kind of Immuno compromised status. In old age this *Vishamagni* has two adverse effects- 1. Deterioration of *Bhootagnis* and *Dhatwagnis* governed by it and 2. Qualitative impairment of the *Rasadhatu* which loses its function of *Preenana*. Both these ultimately leads to *Dhatukshya*.^[38]

Asatmedriyarthasamyoga / Pragnyaparada/ Parinama



8.2.3 Samprapthi of Akala jara – Avarana

Asatmedriyarthasamyoga / Pragnyaparada / Parinama



Jara lakshana samucchaya

Vata by its natural tendency of aggravation due to old age results in the *Vata vriddhi Lakshana*. Dual combination of aggravated *Vata* and *Vishamagni* causes

deterioration of fluid medium of the body which results in *Kapha kshaya*, with corresponding bodily symptoms. Both these *Lakshanas* are presented in [Table 4] *Dhatu*

specific^[40] and *Sroto vaigunya lakshanas*^[40] related to *Jara* are also presented in [Table 5] and [Table 6]. Broadly, all the age related problems, being degenerative in nature are *Kshaya* entities, and can be grouped into 3 categories - 1. Structural deterioration, 2. Functional incapacities and 3. Intellectual impairment. In Ayurvedic sense all the above three falls under *Vataja vikaras*. In *Vriddhavastha*, the aged *Vata dosha* is physiologically in dominant state and the *Rasadi dhatus* are in a deprived state. This potent combination is responsible for the aged being submerged in a sea of multiple pathology^[41], which results in many illnesses presented in [Table 7] *Ashiti vatavyadhis* in old age^[42]

Age (Ayurveda Gift to Elderly) - Rasayana (Rejuvenescence)

Rasayana is one among the eight clinical specialities of Classical Ayurveda (*Ashtanga Ayurveda*). It is not only a drug therapy but is a specialized procedure practiced in the form of rejuvenative recipes, dietary regimen and special health-promoting conduct and behaviour. *Rasayana* comprehends all the modalities of Health Care i.e., Preventive, curative, eliminative, restorative, behavioural, pharmaceutical, dietetic and so on. The very meaning of the word '*Rasayana*' (*Rasa + Ayana*) refers to nutrition and its transportation in the body. Such a state of improved nutrition is claimed to lead to a series of secondary attributes like prevention of aging and longevity, immunity against diseases, mental competence, increased vitality and luster of the body. *Bhavapraksha* defined *Rasayana* as the therapy that alleviates *Vyadhi*, *Jara* and stabilizes youth and included *Chakshushya*, *Brimhana* and *Vrishya* in the *Rasayana*.^[43]

Pharmacodynamics of Rasayana

- Nourishes and maintains cell life - Neutraceutical action
- Encourages growth of new cells - Regenerative action
- Prevents recurrent infections, expels damaged cells - Immunomodulatory action
- Eliminates toxic metabolites and pollutants - Antioxidant action
- Keeps balance b/w body, mind and surroundings - Adaptogenic
- Delays aging process - Anti aging
- Prophylactic to occurrence of diseases - Prebiotics
- Promotes vigour and vitality - Aphrodisiac^[44]

Utility of Rasayana - For practical utility it can be classified into three categories^[45] - Preventive *Rasayana* (*Ajasrika* & *Achara*); Promotive *Rasayana* (*Kamya*) and Curative *Rasayana* (*Naimittika*). ***Ajasrika rasayana*** (*Pathya*/Functional foods/Dietary regime) - Healthy food claimed to have a health-promoting or disease-preventing property beyond the basic function of supplying nutrients. Few examples are - Regular intake of *Goghrit* & *Godugdha* for all; Regular intake of *Lahsun* in CVS disorders; Regular intake *Vrishya* in polygamy, Regular intake of *Mansa* in *Kshaya rogi*; Regular intake of *Suranakanda* in *Arsho rogi* etc.,^[46] *Achara Rasayana* (Psycho socio behavioural and humanistic approach) - It is a mode of living behavior and conduct. It envisages a

code of conduct to lead stress free life which in turn fetches longevity. The persons who wish to live longer and stay away from diseases should follow these principles like Speaking pleasant and truthful words always, Kindness towards all includes animals, Respectful and friendly attitude towards the elders, teachers, parents, learned ones and god, etc., and Things like anger, violence and jealousy, indulgence in liquor and sex, fatigue due to excessive strain, roughness in words, cruel and sinful acts to be avoided.^[47] Its current day applications are Joy of Giving, Joy of Forgiveness, Power of Love, Power of Prayer, Faith healing etc.,^[48]

Promotive (*Kamya*) rasayana - It depends on specific quality to be promoted for example - *Prana kamya* (increases longevity) - *Jeevaniya gana*; *Medha kamya* (sharpens Intellect) - *Shankapushpi*, *Mandukapani* etc; *Srikamya* (improves complexion)- *Twachya* (*Bhringaraja*, *Vijayasar* etc.); *Varnya* (*Pippali*, *Rasona*, *yashtimadhu* etc.); *Kanti* (*Vridhdha darunaka*) **Curative (*Naimittika*) Rasayana** - It is an Adjunctive therapy i.e., an additional or secondary therapy combined with a primary treatment to get better cure rates or a faster response to primary treatment. In certain instances, a second medicine doesn't treat the primary condition but actually makes the first medicine work more effectively. Ex - Piperine to RNTCP. Adjunctive therapy may be employed is to minimize side effects of a primary therapy. Ex. ART, ATT etc.,^[48]

Discussion & Conclusion

Rasayana is an effective therapeutic modality in the form of a most systematic, comprehensive and appropriate consisting concepts, drugs and ways followed in the theory and features of psychosomatic in nature. *Rasayana* is to protect body from old age and its physical as well as mental changes and therapy is not only efficient to counter senility, it has been interpreted and established in the form of promotive therapy as a whole, with preventive or protective and promotive activities. The promotion of body tissues and their quality in regenerative manner, by checking degenerative process and supplementing degeneration through regeneration in the body due to age factor in normal course. In this way, alternative, rejuvenate and protective therapy or alike all pertain to *Rasayana* that is chiefly meant for preventing old age as its specific purpose.^[49] Great *maharishis* like *Charaka* and *Vaghbata* named the very first chapters of their treatises "*Dheerganjviteeyam*" and "*Ayushkamyam*" respectively, wherein the measures to be adopted so as to gain a longer and healthier life were enumerated. This unusual presentation itself proves beyond any doubt that the viable and vibrant concepts of Geriatrics were incorporated into Ayurvedic tenets, much ahead of time.

"*Anayasena maranam vina dainyena jeevitam*"- this particular quote from the scriptures of Indian philosophy meaning peaceful and self sufficient life. This is in tune with the objective of *Ayurvedic* perspective of Geriatric medicine (*Geriatutrics*) i.e., Longer life with lesser disease and painless death. The chief aim of *Rasayana* is to '**Add life to years**' along with 'years to

life'. If *Ayurvedic Rasayana* therapy is applied in true spirit, it is possible to achieve this desired goal. Therefore it is high time that some rethinking takes place among health planners to accommodate the above objectives.

REFERENCES

1. Tiwari BG & Upadhyaya BN. Concept of aging in Ayurveda, Indian Journal of Traditional Knowledge, Vol.8(3), July 2009; 396-399.
2. Sastry NV, editor (Telugu). *Charaka Samhita, Sutra Sthana, Deerghamjivitiyam Adhyaya*, 1/42, Vavilla press, Madras, 1935.
3. Ibidem *Charaka Samhita* (2), *Sharira vichaya Shareeram Adhyaya*, 6/4.
4. Swamy R, editor (Telugu). *Susruta Samhita, Sutra Sthana, Doshadhatumala vriddhikshaya vignaniyam Adhyaya*, 15/3, Vavilla press, Madras, 1952.
5. Ibidem *Charaka Samhita* (2), *Gulmaroga Chikitsitam Adhyaya*, 5/4.
6. Sathya N Dornala. Biology of senescence – an Ayurvedic perspective. Available on aapna.org/Biology%20of%20Senescence.docx (accessed on August 04, 2012).
7. Newton G. Effects of *Rasayana on Jara* (aging) – A clinical study, MD Thesis. Gopabandhu ayurved mahavidyalay, Puri, 2001.
8. Ibidem *Charaka Samhita* (2), *Shareera vichaya shareeram Adhyaya*, 6/13.
9. Suresh babu S. Geriatrics in Ayurveda. Choukhambha Orientalia, Varanasi, 2001; p.43.
10. Singh RH. Ayurvedic concept of healthcare in Oldage. In A.B.Dey editor. *Aging in India – Situation analysis and planning for the future*. Ministry of Health and Family welfare, Govt. of India, 2003; 240.
11. Ibidem *Charaka Samhita* (2), *Sroto vimanam Adhyaya*, 5/25.
12. Ibidem *Susruta Samhita* (4), *Shonithavarnaniyam sutrasthana Adhyaya*, 14/19.
13. Ibidem *Susruta Samhita* (4), *Nivrittasantapiyam Rasayana Chikitsitam Adhyaya*, 30/13.
14. Ibidem *Susruta Samhita* (4), *Panchendriyardha vipratipatti sutrasthana Adhyaya*, 30/33.
15. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001; p.80.
16. Ibidem *Charaka Samhita* (2), *Kiyanthasirasiyam sutra sthana Adhyaya*, 17/117.
17. Ibidem *Charaka Samhita* (2), *Tristhrishaniyam sutrasthana Adhyaya*, 11/36.
18. Chakrapanidatta, Commentator. *Charaka Samhita, Sutra Sthana, Tristhrishaniyam Adhyaya*, 11/36.
19. Ibidem *Susruta Samhita* (4), *Doshadhatumala vriddhikshaya vignaniyam sutrasthana Adhyaya*, 15/26.
20. Ibidem *Susruta Samhita* (4), *Doshadhatumala vriddhikshaya vignaniyam sutrasthana Adhyaya*, 15/24.
21. Ibidem *Charaka Samhita* (2), *Rajyakshma Chikitsitam Adhyaya*, 8/42.
22. Sumitra M. Katre, editor. *Panini's Ashtadhyayi*. Delhi, 1989; 5/2:93.
23. *Hatayoga pradeepika*
24. Ibidem *Charaka Samhita* (2), *Vividhashitapitiyam sutrasthana Adhyaya*, 28/20.
25. Ibidem *Charaka Samhita* (2), *Ardhedasha mahamuliyam sutra sthana Adhyaya*, 30/24.
26. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001;54.
27. Ibidem *Susruta Samhita* (4), *Panchendriyardha vipratipatti sutrasthana Adhyaya*, 15/32.
28. Ibidem *Charaka Samhita* (2), *Chikitsaprabrutiyam sutrasthana Adhyaya*, 16/27-28.
29. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001; p.58
30. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001; p.17
31. Ibidem *Charaka Samhita* (2), *Tristhrishaniyam sutrasthana Adhyaya*, 11/43.
32. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001; p.38.
33. Chakrapanidatta, Commentator. *Charaka Samhita, Sutra Sthana, Deerghamjivitiyam Adhyaya*, 1/3.
34. Ibidem *Charaka Samhita* (2), *Vataroga Chikitsitam Adhyaya*, 28/59.
35. Sharma IV, editor (Telugu). *Rasa ratna samucchya, Uttara Khand; Rasayana Chikitsa Adhyaya*, 15/2. The Indian Medical Practitioners Pharmacy and Stores Ltd, Madras, 1963.
36. Rao DV. *Madhava nidana sesham Telugu version*. Box press, Rajahmundry AP, 1964. p.58-59
37. Ibidem *Charaka Samhita* (2), *Rasayana Chikitsitam Adhyaya*, 1.2/3.
38. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001; p.44
39. Sathya N Dornala, Principles and practice of Jara chikitsa w.s.r. to day to day aging problems, delivered guest lecture at ROTP on Geriatrics, RA Podar medical college, Mumbai.
40. Mahadevan L. Neurological and Musculoskeletal disorders of old age. Proceedings of the second National Ayurveda congress on Jaravyadhis and Manas roga. Tamilnadu: Sowparnika foundation for research, health and education, 2002. p.10-15
41. Suresh babu S. Geriatrics in Ayurveda; Choukhambha Orientalia, Varanasi, 2001; p.7-8.
42. Mahadevan L. Neurological and Musculoskeletal disorders of old age. Proceedings of the second National Ayurveda congress on Jaravyadhis and Manas roga. Tamilnadu: Sowparnika foundation for research, health and education, 2002. p.16-24
43. Sastry MV, editor (Telugu). *Bhava praksha, Uttara Tantra; Chapter 73, Verse 1*. Panduranga printing works, Vijayawada, AP, 1959.

44. Venkataraman S. Ama vis – a- vis free radicals & Rasayana vis-à-vis Antioxidants. Proceedings of the second National Ayurveda congress on Jaravyadhis and Manas roga. Tamilnadu: Sowparnika foundation for research, health and education, 2002. p.130.
45. Agnives CR. Rejuvenation therapy (*Jaraa chikitsa*) – Ayurvedic perspective. In Sharma OP, editor. Geriatric care. 3rd ed. Viva books private limited, New Delhi, 2008. p.710-713
46. Sathya N Dornala, How to Increase Rogibala, delivered guest lecture at All India Ayurveda Mahasammelan, New Delhi.
47. Ibidem *Charaka Samhita* (2), Rasayana Chikitsitam Adhyaya, 1.1/7.
48. Sathya N Dornala, How to Increase Rogibala, delivered guest lecture at All India Ayurveda Mahasammelan, New Delhi.
49. Sathya N Dornala, A clinical study on the effect of bhringarajasav as naimittika rasayana in the management of Rajayakshma w.s.r. to pulmonary TB. MD Thesis, Dept. of Kayachikitsa, Government Ayurvedic college, Hyderabad, 2005.
50. Sharma MS, editor (Telugu). Ashtanga samgraham, Shareera Sthana Adhyaya; 8/25. Telugu academy, Hyderabad, 1993.
51. Sharma MS, editor (Telugu). Sharangadhara Samhita, Purva Khanda; Chapter 6, Verse 20, Vavilla press, Madras, 1937.

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<i>Dosha / Vayoavstha</i>	<i>Balyavastha</i>	<i>Madhyamavastha</i>	<i>Vriddhavastha</i>
<i>Kapha</i>	+++	++	+
<i>Pitta</i>	++	+++	++
<i>Vata</i>	+	++	+++

S/No.	Theories of Aging	Ayurvedic principles
1.	Mutation & Telomere theory	<i>Kala / Parinama</i>
2.	Free radical theory	<i>Vata</i>
3.	Programmed theory / Neuro Endocrine theory	<i>Pitta</i>
4.	Mitochondrial damage theory	<i>Agni</i>
5.	Waste accumulation theory	<i>Tri Malas & Ama</i>
6.	Molecular cross linkage theory	<i>Kapha</i>
7.	Immunological theory	<i>Ojas</i>
8.	Wear and Tear theory	<i>Sapta Dhatus & Srotodushti</i>

Decades of Life	Biological loss as per <i>Vaghbata</i> [50]	Biological loss as per <i>Sharangadhara</i> [51]
First	<i>Balyam</i> (Childhood)	<i>Balyam</i> (Childhood)
Second	<i>Vridhhi</i> (Growth)	<i>Vridhhi</i> (Growth)
Third	<i>Chavi</i> (Beauty & Lustre)	<i>Chavi</i> (Beauty & Lustre)
Fourth	<i>Medha</i> (Intellect)	<i>Medha</i> (Intellect)
Fifth	<i>Twak</i> (Skin texture)	<i>Twak</i> (Skin texture / firmness)
Sixth	<i>Sukra</i> (Reproductive capacity)	<i>Drishti</i> (Visual acuity)
Seventh	<i>Drishti</i> (Visual acuity)	<i>Sukra</i> (Reproductive capacity)
Eighth	<i>Vikrama</i> (Physical stamina)	<i>Vikrama</i> (Valour)
Ninth	<i>Buddhi</i> (Memory)	<i>Buddhi</i> (Memory)
Tenth	<i>Karmendriya</i> (Motor functions)	<i>Karmendriya</i> (Motor functions)
Eleventh	-	<i>Chetana</i> (Mind)
Twelfth	-	<i>Jeevitam</i> (Life)

Table 4 : Vata vriddhi & Kapha kshaya lakshana	
Vata vriddhi Lakshanas	Kapha kshaya Lakshana
<ol style="list-style-type: none"> 1. <i>Vak parushya</i> (Dry speech) 2. <i>Twak parushya</i> (Dryness of skin) 3. <i>Karnya</i> (Discoloration) 4. <i>Karshya</i> (Emaciation) 5. <i>Gatraspurana</i> (Bodily fasciculations) 6. <i>Ushnakamitwa</i> (Longingness of hot) 7. <i>Nidranasha</i> (Insomnia) 8. <i>Alpabalatwa</i> (Weak strength) 9. <i>Utsaha hani</i> (Lack of enthusiasm) 10. <i>Kampa</i> (Tremors) 11. <i>Anaha</i> (Decreased intestinal motility) 12. <i>Sakrith graha</i> (Constipation) 13. <i>Indriyabhramsa</i> (Sensory impairment) 14. <i>Pralapa</i> (Altered consciousness) 15. <i>Bhrama</i> (Giddiness) 16. <i>Dheenatah</i> (Dullness) 	<ol style="list-style-type: none"> 1. <i>Rukshata</i> (Dryness) 2. <i>Antardaha</i> (Burning sensation) 3. <i>Sirahsunyata</i> (feeling of emptiness in the head) 4. <i>Sandhi saithilya</i> (Loosening of joints) 5. <i>Trishna</i> (Dryness of mouth) 6. <i>Dourbalya</i> (Debility) 7. <i>Nidranasa</i> (Sleeplessness) 8. <i>Amaseyetara sunyata</i> (feeling of emptiness in the stomach)

Table 5	
Vata in Sapta Dhatu	Typical symptomatology in Jara / Aging
<i>Rasa</i>	Skin is dry, rough, cracked, cold, hard, dark and discolored, dehydrated, numbness, pricking pain, stretching and redness, pain in small joints of hands and feet.
<i>Rakta</i>	Poor circulation, cold or warm, blood clots, varicose veins and gout, anemia, severe pains, <i>Santapa</i> , discoloration, emaciation, anorexia, skin lesion, feeling of heaviness.
<i>Mansa</i>	Muscle spasm, tremors, pain, stiffness, wasting, paralysis, exhaustion
<i>Meda</i>	Lack of lubrication, loosening of joints, dislocation of joints, low back ache, lack of fat, enlargement of spleen, feeling of heaviness.
<i>Asthi</i>	Joint pain, osteoporosis, osteo arthritis, dental cavities, brittle hair and nails, splitting pains in bones and small joint of hands and feet, sever pain in big joints, wasting of muscles, depletion of strength.
<i>Majja</i>	Leukemia, anemia, osteoporosis, paralysis and other neuromuscular problems, coma
<i>Sukra</i>	<i>Rajyakshma</i> , premature ejaculation, absence of sperm, depression, anxiety and other mental emotional problems, abortion or delayed labor, congenital deformities.

Table 6	
Srotas	Srotovaigunya lakshana in Jara
<i>Prana and Rasa</i>	Dyspnoea, Chest pain, Vertigo, Stupor, Tremor, Chest infections, <i>Swasa kasa</i> etc., it is common in old age due to poor resistance, decreased respiratory functions and other systemic diseases like Diabetes, Hypertension etc.
<i>Annavaaha</i>	Loss of appetite, indigestion etc., Obstruction in this <i>Srotas</i> leads to tympanitis, pain abdomen, thirst. During aging, the physiology of GIT is disturbed due to atrophy of the system. Various other conditions associated with this are <i>Agnimandhya</i> , <i>Atisara</i> , <i>Alasaka</i> , <i>Grahani</i> , <i>Ajirna</i> , <i>Parinama sula</i> , <i>Amlapita</i> , <i>Udavarta</i> etc.
<i>Rasa and Rakta</i>	The functioning of <i>Hridaya</i> , <i>Yakritpliha</i> , veins and arteries decrease in aging process day by day. Structural deformity also occurs. <i>Panduta</i> , <i>Daha</i> , <i>Rakta srava</i> etc., occur due to <i>Dushti</i> of these <i>Srotoses</i> . <i>Raktagata vata</i> , <i>Hridaya sunyata</i> , <i>Arti</i> , myocardial infarction, angina are common in aged persons.
<i>Mansa</i>	Due to aggravated <i>Vata</i> in old age, <i>Mamsa saithilya</i> occurs resulting in emaciation, loosening of muscle, loss of elasticity, wrinkles of skin etc., <i>Sotha</i> , <i>Mamsa sosa</i> , <i>Sira granthi</i> etc.
<i>Medas</i>	In <i>Jara</i> , <i>Medo vishyandana</i> takes place. Dumping of adipose tissue, excessive urination are seen in old age. Cholesterol and Lipid metabolism are deranged and deposition of lipids in the artery leads to Arteriosclerosis, Nephropathy and Renal hypertension are also common due to involvement of this system.

<i>Majja</i>	In <i>Jaravastha majja</i> does not get deposited inside the <i>Asthi</i> . So it becomes hollow and weak. <i>Asthisoushira</i> and <i>Asthikshaya</i> are commonly found in this age group. Osteoarthritis, Osteopathy, Polyarthrits, Slip disc, <i>Apabahuka</i> , <i>Viswachi</i> are common conditions found in old age. Different types of anemia can be included in <i>Majja kshaya</i> condition.
<i>Sukra</i>	<i>Klibata</i> , <i>Chirat sukra praseka</i> , and <i>Rakta sukrata</i> etc., Prostatic enlargement is commonly seen in old age.
<i>Purisha</i>	Painful defecation, loose motions, and increased quantity of stool which may be due to diminished peristalsis and loss of fluid in intestines.
<i>Manovaha</i>	<i>Manah harsha</i> , <i>Utsaha</i> , <i>Prayatna</i> , <i>Buddhi</i> , <i>Medha</i> , <i>Abhimana</i> is the various functions of <i>Manas</i> which are affected due to aging.

Table 7 : Vatavyadhis in old age

1. <i>Nakha bedham</i> (Cracks and nail changes)	12. <i>Urustambha</i> (spastic pyramidal disease of legs)	23. <i>Manyastambha</i> (Cervical dystonia)	34. <i>Bhruvivyudas</i> (Ptosis of eyebrow)
2. <i>Vipadhika</i> (Cracks in the feet)	13. <i>Urusada</i> (Weakness of thighs)	24. <i>Hanubheda</i> (Temporo mandibular Dislocation)	35. <i>Shiroruk</i> (Headache)
3. <i>Padasula</i> (Metatarsalgia)	14. <i>Pangulya</i> (Paraplegia)	25. <i>Mukatwam</i> (Aphasia)	36. <i>Ekangaroga</i> (monoplegia)
4. <i>Padabhramsa</i>	15. <i>Sronibheda</i>	26. <i>Vaksangam</i> (Dysarthria)	37. <i>Sarvanga roga</i> (Polyplegia)
5. <i>Padasuptata</i> (neuritis)	16. <i>Khanjata</i> (Lameness)	27. <i>Kashayasyata</i> (Astringent taste mouth)	38. <i>Tamah</i> (Fainting)
6. <i>Vata khuttatha</i> (Calcaneal spur)	17. <i>Kubjata</i> (Kyphosis)	28. <i>Ghrana nasa</i> (Anosmia)	39. <i>Bhrama</i> (Giddiness)
7. <i>Gulpha graha</i> (Arthritic changes in ankles)	18. <i>Trikagraha</i> (Lumbago)	29. <i>Asabdha sravanam</i> (Tinnitus)	40. <i>Vepathu</i> (Tremors)
8. <i>Pindikodweshtanam</i>	19. <i>Pristagraham</i> (Sacro iliac arthritis)	30. <i>Ucchairsavanam</i> (Hard of hearing)	41. <i>Atipralapa</i> (Delirium)
9. <i>Gridhrasi</i> (Sciatica)	20. <i>Parsvamardana</i> (Intercostal myalgia)	31. <i>Badhiryam</i> (Deafness)	42. <i>Rukshata</i> (Xerosis)
10. <i>Janubhedam</i>	21. <i>Bahusosa</i> (Atrophy of Shoulders)	32. <i>Vartmastambha</i> (Bells sign)	43. <i>Asavpna</i> (Sleeplessness)
11. <i>Januvislesha</i>	22. <i>Greevastambha</i>	33. <i>Akshivyudas</i>	44. <i>Anavasthitha chittam</i> (Unstable mind)