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**Review article**

# ROLE OF AGADA (AYURVEDIC COMPOUND) ALONG WITH PANCHKARMA IN DELAYING AGING WITH SPECIAL REFERENCE TO DOOSHI VISHARI AND BILWADI AGADA

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## Abstract

***Background**: The population of older persons is expected to double by 2050(nearly 2.1 billion). Various factors like pollution, smoking etc. act as cumulative toxins in the body and play a role in acceleration of the aging process which is also known as Dooshi Visha in Agadtantra (Ayurvedic Toxicology). **Objective**: The objective of the review is to prove the utility of Dooshi Vishari and Bilwadi Agada to slow down the aging process by experimenting with Panchkarma procedure. **Methods**: The data related to aging, Vaya, and other related topics have been collected from Ayurvedic text books, Nighantus & Samhitas. For the modern concept of aging, explored related websites and reports to collect data on related topics. **Discussion**: Dooshi Vishari and Bilwadi Agada are very capable of dealing with all the cases of cumulative toxicity and also have various anti-aging properties like anti-oxidant, immunomodulatory effects etc. Absorption of drugs occurs quickly in a detoxified body so the use of both compounds after the Panchkarma procedures can do their work more effectively. **Conclusion**: Based on the properties and effects of Dooshi Vishari and Bilwadi Agada, we can estimate to what extent this can be effective in premature aging. Panchakarma Chikitsa acts as a preventive, promotive and curative factor in the body. So if we use Dooshivishari and Bilwadi Agada with Panchakarma as a preventive aspect, then it is ultimately capable of effectively preventing all types of diseases as well as premature aging.*

**Keywords-** Aging, *Agadtantra*, *Dooshi Visha*, *Dooshi Vishari Agada*, *Bilwadi Agada*, *Panchkarma.*

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## Introduction

The global population was 60 years or more at 962 million in 2017, more than double that of 1980. The population of older persons is expected to double again by 2050 (nearly 2.1 billion). Aging is the process of becoming older. During the aging process, there is a gradual decay of molecules and cells in the body at the biological level. This causes a gradual decrease in physical and mental capacity, an increased risk of disease, and eventually death. Beyond biological changes aging is also associated with pollution, sun exposure, smoking, diet etc. Regular exposure of pollutants like dust, gases, metals, chemicals etc. accumulate in our body and act like *Dooshi visha* (cumulative toxicity) which accelerate the aging process.

Between 2015 and 2050, the proportion of the global population above the age of 60 will almost double from 12% to 22%.The aging rate of the population is much faster than in the past. The main challenge facing almost all countries today is that their health and social systems can easily cope with this demographic change. [1].

*Ayu* (age) means the conjunction of body, sense organs, mind and self [2]. Ayurveda is said as eternally continuing [3], hence one should devote himself to it constantly and without any negligence, this is worth doing [4]. In ancient Ayurvedic literatures *Dincharya* (routines)[5], *Ritucharya* (seasonal)[6], *Sadvritta* (personal hygiene and behavior)[7], *Aahar-Vihaar* (diet and personal activity), *Rasayan therapy* (rejuvenation), *Panchkarma* etc. have been called aids to achieve longevity.

Environmental pollution is increasing day by day, as a result of which many diseases are spreading in the human race. Diseases caused by pollution are mainly due to cumulative toxicity, which in the perspective of *Agadtantra* is similar to the *Dooshi visha*. ***Ayurvedic* toxicology** (***Agadtantra***) is a special branch of ***Astanga Ayurveda*** which deals with spotting of poison, types of poison from plant, animal kingdoms and minerals as well as artificial poisons and their treatment [8].The description of the use of many types of *Agadas* for the treatment of poisoning is found in the Ayurvedic literatures, some of which come to *Dooshi Vishari* and *Bilwadi agada* in the leading lead.

## Aims & Objectives

1. To understand and discuss the concept of aging.
2. To establish the importance of *Agada* in the delaying of aging process along with *Panchkarma*.

## Materials and Methods

The data related to aging, *Vaya*, and other related topics have been collected from Ayurvedic text books, *Nighantus* & *Samhitas*. For modern concept of aging, explored related websites and reports to collect data on related topics.

## Concept of aging

*Vaya* (age) can be defined as the duration of time since birth to the present for a living individual [9]. Ayurveda has described the concept of aging as *'Jara'*. As a summary of Ayurveda texts, three major divisions of the age have been done i.e. B*alyavastha* (young age), *Madhyamavastha* (middle age) and *Vridhhavastha* (old age) are shown in table 1.

Table 1: Three stages of age

| ***Acharya*** | ***Balyavastha*** | ***Madhyama Vastha*** | ***Vridhha Vastha*** |
|---|---|---|---|
| ***Charaka***[10] | Birth to 30 yrs<br>1. *Aparipakwa dhautu* Birth to 16 yrs<br>2. *Vivardhaman dhatu* 16 yrs to 30 yrs | 30-60 yrs | 60-100 yrs |
| ***Sushruta***[11] | Birth to 16 years<br>1. *Ksheerapa* – up to 1 yr<br>2. *Ksheerannada* – up to 2 yrs<br>3. *Annada* – 2 yrs to 16 yrs | 16-70 yrs<br>1. *Vriddhi* – up to 20 yrs<br>2. *Yavana* – up to 30 yrs<br>3. *Sampurna* – up to 40 yrs<br>4. *Hani* – 40-70 yrs | Above 70 yrs |
| ***Astang Samgraha*** [12] | | | Above 60 yrs |

## Sequential loss in aging

*Sharangadhara Samhita* and *Ashtanga Sangraha* describe the sequential bio-loss during different decades of life due to process of aging is mentioned in table 2 [13-15].

Table 2: Sequential loss in aging

| Decade | ***Sharangdhar*** | ***Astang Samgraha*** |
|---|---|---|
| 1st | *Balyam* (Childhood) | *Balyam* (Childhood) |
| 2nd | *Vriddhi* (Growth) | *Vriddhi* (Growth) |
| 3rd | *Chavi* (Complexion) | *Prabha* (Luster) |
| 4th | *Medha* (Intellect) | *Medha* (Intellect) |
| 5th | *Twaka* (Skin) | *Twak* (Skin) |
| 6th | *Drishti* (Vision) | *Shukra* (Virility) |
| 7th | *Shukra* (Virility) | *Drishti* (Vision) |
| 8th | *Vikram* (Strength) | *Shrotendriya* (Hearing) |
| 9th | *Buddhi* (Intellect) | *Mana* (Spirituality) |
| 10th | *Karma* (Function of all the Indriya) | *Sarvendriya* (All the senses) |

## Pathophysiology of aging

Ayurveda is science of life and it's completely dedicated to protecting the age. In Ayurveda, many such theories are described, from which the principle of the destruction of age can be understood. Some of the major theories are:-

***1. Swabhavoparamvaad*** (Natural destruction process) [16]–

*Ayu* has its own *'Swabhav'* (natural tendency) to destruct by time which is responsible for aging.

***2. Aahar*** (Diet) [17]–

Life is non-viable without food. Food is the only source of the maturation, stability, solidity and healthful gleam of organic beings. It is the food that empowers the organs of sense and makes them active in their field of work. Irregularity of diet is the cause of origin of all diseases.

***3. Nidra*** (Sleep) [18] –

Like diet, sleep is also important to maintain the quality of health. Sleep is one of the main pillars of the concept of good health. There can be many factors affecting sleep such as age, daily lifestyle, diet, environment etc. Ayurveda says that if sleep is not taken naturally then it acts as a motivator

in bringing problems related to old age quickly that can accelerate the aging process.

***4. Tridosha*** (Three essential components of the body) [19] –

*Vaat*, *Pitta* and *Kapha* are the three main pillars of human life without which life cannot be imagined. These fundamental and important elements, which reside respectively on the lower, middle and upper parts of the body, maintain stability of life. The human body is supported by three fundamental elements in the same way that a dwelling-house is covered with three-supporting poles or claws. The deranged condition of these three essential pillars is mortal, while their normal state sustains life.

***5. Akala Jara*** (Premature aging) [20, 21] –

The etiological factors for initiating the early aging process according to Ayurveda are well described by *Charaka* and *Vagbhata*. All the etiological factors for aging can be differentiated in three categories i.e. *Aaharatmak hetu* (dietary factors), *Viharatmak hetu* (personal activity) and *Mansik hetu* (psychological factors).

Consuming a well balanced diet and having disciplined personal activity is good for health. A healthy person has the identity that his digestive fire is working properly; all body elements are being nourished and the excreta are properly removed as well as all the functions of the body are going well and the mind, soul and senses are happy. [22].

Consuming components on the contrary is harmful to health and enhances the premature aging. The effect of pollution and cumulative poisoning on the body is also one of the important reasons for bringing aging quickly.

**Modern concept of aging**

Programmed and damage or error theories are the two main categories of the Modern biological theories of aging in humans. The **programmed theories** means that aging is regulated by a biological timeline (modified by changes in protein expression that affected the systems monitor for sustenance, restoration and defense reactions), and Theories of damage or error make a point of environmental attacks for living organisms that

induce cumulative damage at various levels as they age. Subcategories of above said theories are mentioned in table 3[23].

Table 3: Subcategory of programmed & Damage theory

| Programmed theory | Damage or error theory |
|---|---|
| 1) **Programmed Longevity**, which considers aging to be the result of the gradual and discontinuation of some genes, with age defined as the time to reveal deficiencies related to aging.<br>2) **Endocrine Theory**, where on Biological clocks act through hormones to control the speed of aging.<br>3) **Immunological Theory**, which suggests that the immune system is programmed to decrease over time, increasing the likelihood of infectious disease and thus aging and death. | 1) **Wear and tear theory,** where significant parts in our cells and tissues move out, is resulting in aging.<br>2) **Rate of living theory**, which reinforce the theory that the higher an organisms rate of oxygen basal, metabolism, the shorter its lifespan.<br>3) **Cross-linking theory**, according to which an accretion of cross-linked proteins damages cells and tissues, slows down physiological processes and thus results in aging.<br>4) **Free radicals theory**, which suggest that superoxide and other free radicals cause damage to the macro-cellular components of the cell, leading to damage to cells, and eventually to stop functioning of organs. |

## Effects of aging

There are many problems in old age which are commonly reflected as loss of memory, loss of hearing, cataracts & refractive errors, joints pain and osteoarthritis, respiratory diseases (COPD), hypertension, diabetes and depression. Along with old age, many complex health problems also arise which occur only in the later stages of life and also is a continuous process, they are known as Geriatric Syndromes, which is a group of diseases include fragility, weakness, urinary urgency, delirium, falls and pressure ulcers etc.[24]

**Effects of Cumulative toxicity (*Dooshi Visha*)**

**Early signs of *Dooshi Visha*** [25]–

Excessive sleep, heaviness, yawing, laxity of joints, horripilation & body ache.

**Symptoms of *Dooshi Visha*** [26]–

Looseness of stool (Diarrhoea), a lustrelessappearance, malodour of the body, awful taste in the mouth, polydipsia, epileptic fits, nausea & vomiting, lassitude, impairment of speech and all the symptoms of *Dusyodara* (Ascites), the patient become rapidly emaciated.

***Dhatugata* (tissue level) symptoms of *Dooshi Visha***[27] **–**

When *Dooshi Visha*staying in *Rasadi dhatus*following symptoms are appears:-

1. ***Rasadhatu*** – *Aruchi* (anorexia), *Ajirna* (indigestion) is developed
2. ***Raktadhatu*** – *Kushta-visarpa* (skin disorders)
3. ***Mansadhatu*** – *Mansarbud* (tumors)
4. ***Medadhatu*** – *Medogranthi* (lipoma and other fat originated tumor)
5. ***Asthidhatu*** – *Adhidantadi vikar* (extra growth of teeth &bony parts)
6. ***Majjadhatu***–*Tamodarshan* (hypoxia and visual difficulties)
7. ***Shukradhatu***–*Klaibya* (sterility)

**Supervening symptoms of *Dooshi Visha*** [28] – Pyrexia, burning sensation in the body, hiccough, distension of abdomen, oligospermia, sterility, inflammation or edema of body parts, cardiac disorders, psychosomatic disorders, tremors etc.

**Similarity between Aging and Cumulative toxicity (*Dooshi Visha*)**

*Acharya Sushruta* pointed out that a portion of *Sthavara* (inanimate), *Jangam* (animate) or *Krutrim* (artificial) poison, which due to accumulated nature is not able to come out of the body completely and accumulates in the body for a long time, destroys the body slowly is called *Dooshi Visha*. It becomes *Avritta* by *Kapha* (lipophilic binding) and accumulates in that state for years [29].

This whole process of *Dooshi Visha* can be easily understood with the concept of bioaccumulation. Bioaccumulation refers to the aggregation of substances, such as pesticides, other inorganic or organic chemicals increature. Most of the bioaccumulative chemicals are fat-soluble so that they have a tendency to lodge primarily in fat deposits or in the fatty substances in blood [30].

At the biological level aging is also a gradual process and condition that arises as a result of the decay of tissues and cells. Many such symptoms which are caused by aging are very similar to the symptoms arising from the effects of the cumulative poison.

***Dooshi Vishari Agada***

This is a very useful herbo-mineral compound described by *Acharya Sushruta* and *Vagbhatta* which can be used in all cases of *Dooshi Visha* (cumulative toxicity) as well as other types of toxicity. Components and therapeutic effects of *Dooshi Vishari Agada* are mentioned in table 4 and 5 respectively[31,32].

Table 4: Components of *Dooshi Vishari Agada*

| S. No. | Ayurvedic name | Latin name | Part used |
|---|---|---|---|
| 1. | *Pippali* | *Piper longum* Linn. | *Phala* (Fruit) |
| 2. | *Dhyamak* | *Cymbopogon martinii* (Roxb.) Wats. | *Patra* (Leaves) |
| 3. | *Jatamansi* | *Nardostachys jatamamsi* DC. | *Mula* (Root) |
| 4. | *Lodhra* | *Symplocos racemosa* Roxb. | *Twak* (Stem Bark) |
| 5. | *Ela* | *Elettaria cardamomum* Maton. | *Phala* (Fruit) |
| 6. | *Suvarchika* | *Tribulus terrestris* Linn. | *Phala* (Fruit), *Mula* (Root) |
| 7. | *Kuttanatam* | *Oroxylum indicum* (Linn) Benth. ExKurze. | *Mulatwak* (Root bark) |
| 8. | *Natam* | *Valeriana wallichii* D.C. | *Mula* (Root) |
| 9. | *Kusta* | *Saussurea lappa* C.B. Clarke. | *Mula* (Root) |
| 10. | *Rakhtachandana* | *Pterocarpus santalinus* Linn. f. | *Khandasara* (Heartwood) |
| 11. | *Yastimadhu* | *Glycyrrhiza glabra* Linn. | *Mula* (Root) |
| 12. | *Gairik* | Red ochre | |

Table 5: Therapeutic effects of *Dooshi Vishari Agada*

| Name | Therapeutic Effects |
|---|---|
| *Dooshi Vishari Agada* | Antimicrobial[33], antifungal[34], antioxidant activity[33,34], neuro-protective[34] and anti-teratogenic effect[35] |

## Qualitative parameters and Phytochemical screening of *Dooshi Vishari Agada*

Ayurveda has always been a centre of attraction in the field of research. From time to time, the process of research on Ayurvedic formulations is carried out at various levels. *Dooshi Vishari Agada* is one of them, on which many researches have been done. The presence of the substances like carbohydrates, monosaccharides, hexose, proteins, steroids, glycosides, saponins, alkaloids and tannins is shown in phytochemical screening reports of this *Agada*. The qualitative parameters related data of *Dooshi Vishari Agada*are shown in table 6[36].

Table 6: Qualitative parameters of *Dooshi Vishari Agada*

| S. No. | Parameters | Result |
|---|---|---|
| 1. | Carbonate ($CO_3$) | Negative |
| 2. | Calcium (Ca) | Negative |
| 3. | Magnesium (Mg) | Negative |
| 4. | Potassium (K) | Negative |
| 5. | Iron (Fe) | Present |
| 6. | Sulphate ($SO_4$) | Present |
| 7. | Chloride (Cl-) | Negative |
| 8. | Nitrate ($NO_3$-) | Present |
| 9. | Sodium (Na) | Present |

### *Bilwadi Agada*

*Bilwadi agada* is very known and useful Ayurvedic formulation under the context of poisoning. It is described by *Acharya Vagbhatta* and widely used in various cases of poisoning like snake bite, scorpion sting, *Gara visha*,

*Dushi visha* etc.Therapeutic effects and Ingredients of *Bilwadi Agada* are mentioned in table 8 and 9 respectively[37]

Table 8: Therapeutic effects of *Bilwadi Agada*

| **Name** | **Therapeutic effect** |
|---|---|
| *Bilwadi Agada* | Anti-toxic[38], anti-inflammatory[39-43], anti-allergic[44],Cardio protective[45], antipyretic[46],wound healing activity[47], analgesic[48,49], anti-histaminic[50], immuno-regulatory[51] and anti-bacterial[52] |

Table 9: Ingredients of *Bilwadi Agada*

| **S. No.** | **Ayurvedic name** | **Latin name/ Eng. Name** | **Part used/Use** |
|---|---|---|---|
| 1. | *Bilwa* | *Aegle marmelos* Corr. | *Mula* (Root) |
| 2. | *Sursa* | *Ocimum sanctum* Linn. | *Patra* (Leaves)<br>*Pushpa* (Flower) |
| 3. | *Karanja* | *Pongamia pinnata* Perri. | *Phala* (Fruit) |
| 4. | *Tagara* | *Valeriana wallichii* DC. | *Mula* (Root) |
| 5. | *Devdaru* | *Cedrus deodara* Roxb. | *Twak* (Bark)<br>*Kahandasara* (Heartwood) |
| 6. | *Haritaki* | *Terminalia chebula*Retz. | *Phala* (Fruit) |
| 7. | *Vibhataki* | *Terminalia bellirica*Roxb. | *Phala* (Fruit) |
| 8. | *Amalaki* | *Emblica officinalis* Gaertn. | *Phala* (Fruit) |
| 9. | *Shunthi* | *Zingiber officinale* Rose. | *Prakand* (Rhizome) |
| 10. | *Maricha* | *Piper nigrum*Linn. | *Phala* (Fruit) |
| 11. | *Pippali* | *Piper longum*Linn. | *Phala* (Fruit) |
| 12. | *Haridra* | *Curcuma longa*Linn. | *Mula* (Root) |
| 13. | *Daruharidra* | *Berberis aristata* DC. | *Kahandasara* (Heartwood) |
| 14. | *Ajamutra* | Goats urine | For triturating (Bhavna) |

### *Panchakarma* (Detoxification therapy)

*Shodhana* (Shodhana) means the one which flushes out toxins from the body which are bonded to the minute channels. They are of five in numbers namely *Vamanakarma* (Induced Emesis), *Virechanakarma* (Induced Purgation), *Bastikarma* (Therapeutic Enema), *Nasya karma* (Medication through nostrils) and *Raktamokshana* (Bloodletting) [53]. In present time these are better known as Detoxification therapy where the toxins are eradicated from the body. The main feature of these procedures is that they can be used in diseased people as well as healthy people.

**Therapeutic effects** – Motivates enzyme activity, cleanses the minute channels, makes organs active, enhances the colour and luster, enhances the virility, slows down the aging process, nourishes the cells & tissues and improves energy [54-56].

## Discussion

As we grow old, our physiological actions become less and their implementation takes more time. There are some common signs that indicate aging such as age spots, gaunt hands, inflammation or hyper pigmentation, dry or itchy skin, wrinkles or sagging, hair loss etc. These changes may be surprising if they happen earlier than expected, hence the term "premature" aging. In this period of urbanization and development, nature is being severely damaged. Increasing the level of pollutants day by day is a matter of concern and it directly affects human health. Due to continuous exposure to pollutants or toxins, they accumulate in the body and start contaminating the essential humours of the body over time this entire process is called cumulative toxicity. The process of aging starts rapidly, due to contamination of the body. Premature aging is one of the serious problems arising as a result of pollution or cumulative toxicity.

Ayurvedic medicine system is one of the oldest medical studies in the world, a detailed description of age division and factors affecting age is found in it. The two main purposes of Ayurveda are to protect the health of the healthy person and to treat the disease of the patient. According to both these purposes, it is capable of preventing aging and resolving associated problems caused by them.

*Dooshi Vishari Agada* and *Bilwadi Agada* are very important, well established and easily available compounds described under Ayurvedic toxicology. They are extremely useful in the removal of toxins and free radicals from the body due to their antioxidant and anti-toxic effects, as a result, the aging process slows down and the body remains healthy for a long time. They also have the anti bacterial, anti fungal, anti-histaminic and immunomodulatory actions which protect us from seasonal diseases from time to time and strengthen our immune system. Every day we come in contact with a lot of such harmful chemicals which play their role in causing cancer. Cancer, which is being found in abundance in today's time and affects all segments of the population. The death rate from cancer is also very high. Cancer can be taken under diseases arising from accumulated toxicity as it also slowly affects the body. *Dooshi Vishari Agada* is very capable to dealing with all the cases of cumulative toxicity and it's also has anti-teratogenic effects which is helpful in the prevention of cancer.

The detoxification remedy or *Panchakarma* which eliminates the toxic substances and aggravated *doshas* from the body can be used both in healthy person and the patient. Absorption of drugs like *Dooshi Vishari Agada* and *Bilwadi Agada* occur quickly in detoxified body and they can do their work more effectively. According to the *Ritu* (seasons), *dosha* in the body occur in a raised state, which is a type of disease. If one takes care of this by performing *Panchakarma* in each season may additionally pacify the vitiated *dosha* and help in stopping the ailment.

**Conclusion**

Ayurveda is not only medicine but it is a science of life which gives emphasis on healthy and long life. The main purpose of Ayurveda is to fulfilling the concept of a healthy society but premature aging is a major obstacle in this path. The effect of pre-mature aging is not only limited to the physical, but also affects the state of mind and social life. There are some associated conditions which causing premature aging like smoking, sun exposure, sleep habits, diet, alcohol, stress, environmental factors and cumulative toxicity. A detailed description of what factors should be consumed for healthy and long life is available in Ayurveda. The description of manufacture and use of *Dooshi Vishari Agada* & *Bilwadi Agada* is found under Ayurvedic Toxicology, which is an important and very useful branch

of *Astang Ayurveda*. Based on their properties and effects, we can estimate to what extent this can be effective in premature aging. Use of these drugs with *Panchakarma* is unique and very effective. *Panchakarma Chikitsa* acts as a preventive, promotive and curative factor in the body.

So if we use *Dooshi Vishari Agada* and *Bilwadi Agada*with *Panchakarma* as a preventive aspect, then it is ultimately capable of effectively preventing all types of diseases as well as premature aging, as the aim of Ayurveda is to protect the health of the healthy person and to give him a long life.

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