

Mastering Andropause - An Ayurvedic Way

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Hormones keep constantly fluctuating throughout the life of a human, especially during the older ages and it produces a drastic change resulting in a myriad of symptoms. While these changes are the natural part of our life, it doesn't mean that we are bound to live with these maladies. Over the past few years, there has been a lot of discussion about such a clinical syndrome, menopause. But a similar condition is present in men as well, with both physical and psychological changes and it is called as Andropause. Medically it is defined as a clinical and biochemical syndrome associated with advancing age and characterized by a deficiency in serum androgen levels with or without a decrease in genomic sensitivity to androgens. Typically, andropause can be considered as a syndrome producing a cluster of symptoms by affecting different organs of the body. As ageing has been associated with an abundance of concomitant diseases, the symptoms of andropause are usually missed during a clinical examination. In Ayurveda the contexts of andropause can be understood in the purview of Kalaja and Akalaja Jara with predominant Dhathu Kshaya Lakshanas. In this paper, we review the data on the definition, major clinical symptoms and the treatment modalities of andropause. We also look into the possible concepts and treatment approaches explained in ayurveda in tackling the particular condition.

Keywords: Andropause, Testosterone, Dhathu Kshaya, Jara, Rasayana, Vajeekarana

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Introduction

The word "Andropause" is derived from two Greek words- "Andras" meaning male and "Pause" meaning cessation. So, the term andropause is medically defined as a clinical and biochemical syndrome affecting multiple organ systems associated with advancing age and characterized by a deficiency in serum androgen levels with or without a decrease in genomic sensitivity to androgens.[1] It is also known by the synonyms like Partial Androgen Deficiency in Ageing Men (PADAM), Male Menopause, Male climacteric etc. It may also be referred as Ageing male hypogonadism or late onset hypogonadism. According to UN estimates, India overtook China in having the largest population in the world with a population of 1,425,775,850 at the end of April 2023 and the report highlights that there are 14.9 crore persons aged 60 years as on July 2022[2] and all these people are liable to suffer from different kinds of old age diseases. Thus, health of ageing population is a matter of concern. Andropause is a condition which is usually missed in a clinical scenario. It is a syndrome affecting the multiple organ systems in the body which hampers with the standard of living of an individual. This is a stage when one starts noticing the age-related changes in his body. Therefore, even though the patient is treated by different specialists, his actual problem is undiagnosed which can be rectified by checking the serum testosterone levels. Also, the different presentations of this syndrome make it difficult to create a clinical typeset of andropause. *Ayurveda* has already explained *Rasayana* and *Vajeekarana Chikitsa* in *Samhithas* which is meant for *Swasthya Rakshanam*. If both these treatment measures are adopted at the right time according to the condition of the patient then ageing can be dealt in a graceful manner.

Testosterone - Synthesis and Functional aspects

Testosterone is one among the important androgen in human body. It was first isolated from mice testicles by a Dutch scientist Ernst Laqueur in 1935 and later it was successfully synthesized by German biologist Adolf Butenandt.[3] In humans this cholesterol derived hormone is produced in appropriate amount by Leydig cells of Testes and small amount by the adrenal glands.

Its secretion is regulated by hormones called luteinizing hormones (LH) and follicle stimulating hormones (FSH) secreted by pituitary gland in the brain. Also, the LH controls the amount of testosterone produced by the Leydig cells by regulating the expression of an enzyme which mediates 17- β hydroxysteroid dehydrogenase.[4] So its inhibition also can stop the synthesis of testosterone.

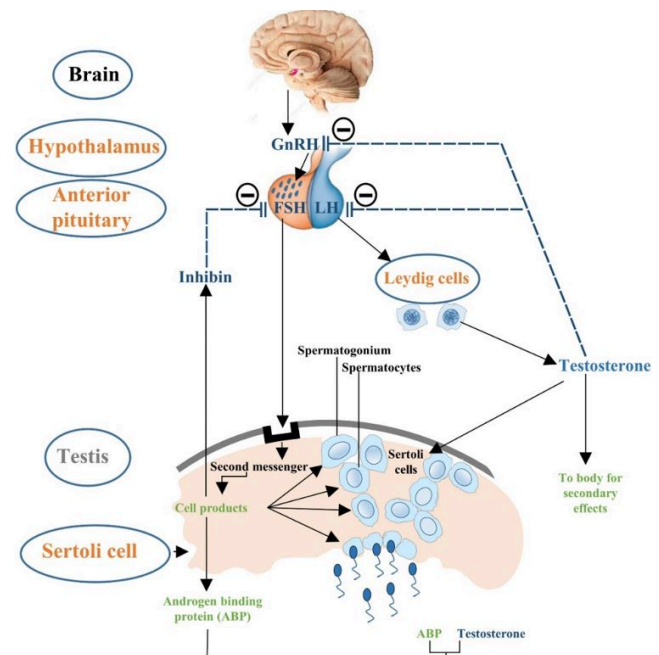


Figure 1

Since it is the main androgen present in males, testosterone is considered as the hormone primarily regulating the sexual functions. It is responsible for the development of primary sexual developments such as testicular descent, spermatogenesis, enlargement of the penis and testes, and increasing the libido. By the action of sufficient quantity of testosterone, testes usually start descending to scrotum by around 7th month of gestation. If a male child is born with undescended testes, and the status is maintained even after 4 to 6 months of age after birth, then the testosterone must be administered to help the testes descend through inguinal canal into the scrotum.

Testosterone is also responsible for the development of secondary sexual characteristics like male hair pattern, voice deepening, growth spurts in puberty etc. Apart from regulating the sexual functions, testosterone is also involved in the synthesis of proteins, which in turn brings about heavier muscle and bone mass in males in comparison with the females.

It also affects many of the metabolic activities such as production of blood cells in the bone marrow, bone formation, lipid metabolism, carbohydrate metabolism, liver function and prostate gland growth.[5] Functional aspects of testosterone in human body are still an incomplete area of research as the scientists are discovering the wider action of this wonderful hormone till date.

There is also a common misconception that testosterone is solely a male hormone. But this is not true. Testosterone is also produced in small quantities by the females. The only difference is that an average woman has 40 to 60 nanograms of testosterone in a deciliter of blood plasma whereas men has 300 to 1000 nanograms per deciliter.[6] In females, it is the estrogen which is mainly concerned with the regulation of sexual functions. It is also proclaimed that at the time of conception even the embryo is female until and unless it is acted upon by testosterone.

The male menopause - Andropause

Andropause which is medically referred to as Androgen Deficiency in Ageing Male (ADAM) is a syndrome affecting the various organs of the body due to the decline in synthesis of the androgen- "Testosterone". By the age of 30, levels of testosterone gradually begin to drop, which is supposed to be the beginning of andropause. Accordingly, it is estimated that by time a person reaches 80 years of age, his 90% of testosterone levels will be depleted. It is through this period of time natural process of ageing progress.

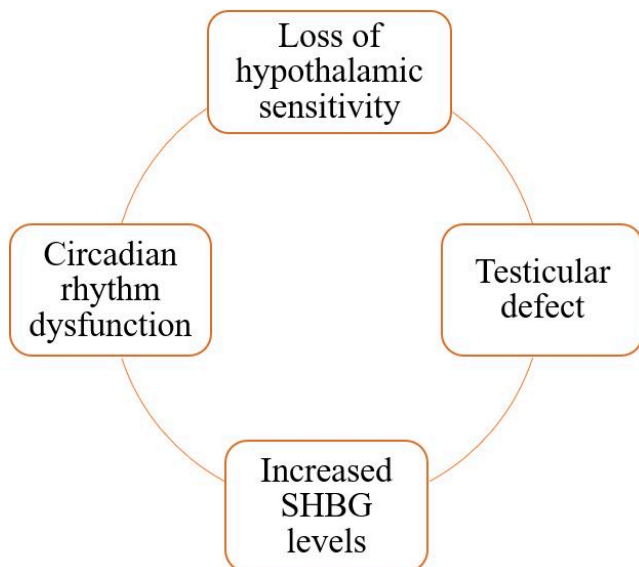


Figure 2

During this period of time natural process of aging progresses in such manner that luteinizing hormone, gonadotropic releasing hormone, and testosterone also will drop below normal levels. This indicates syndrome of Hypogonadotropic hypogonadism and this downward trend takes men progressive to andropause. As compensatory mechanism of body, testosterone production is triggered for while, but it will fall again after some time producing wide array of symptoms. Causes include Apart from this, other life style factors like Alcoholism, smoking, stress, excess weight gain, Lack of exercise & sleep, Diabetes mellitus etc. also contribute to this condition.

Pathophysiology

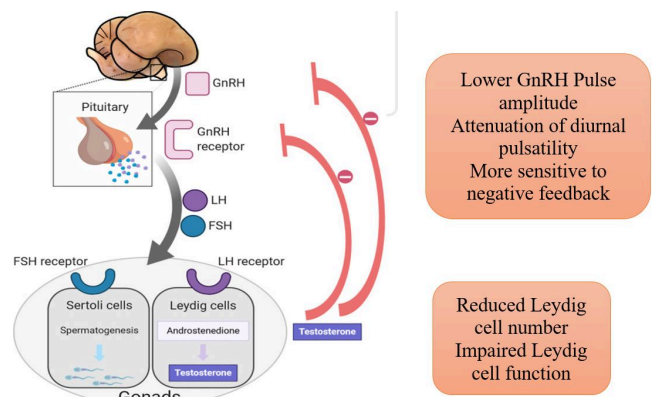


Figure 3

Actual pathophysiology behind the decline in testosterone is unknown. But in ageing it can happen at both the central and peripheral level.

Central level (Hypothalamo-pituitary level)[7]:

There is a reduction of GnRh releasing neuronal cellular mass with age which results in decreased GnRh secretion at each pulse and decreased episodic frequency of high amplitude pulse, which ultimately causes disruption in circadian rhythm, decline of testosterone level and elevation of LH.

Peripheral level[8]

- Testicular changes: Histological evidences of decreased number of leydig cells in aging testicles impaired testicular perfusion and decreased steroid response to stimulation by beta HCG or LH can be attributed to decrease in testosterone level in aging men.
- Blood- hormone binding protein change: With advancement of age there is increase in testosterone binding carrier protein (SHBG) which results in low level of free biologically active testosterone.

Some of the major signs and symptoms include:

Table 1

General Symptoms	<ul style="list-style-type: none"> Reduced general wellbeing Abdominal Obesity Weight Gain Reduced Immunity
Brain and Psychology	<ul style="list-style-type: none"> Anxiety and fear Stroke/paralysis Short term memory loss Depression
Sexual Functions	<ul style="list-style-type: none"> Loss of libido Erectile dysfunction Prostate Enlargement
Metabolic Disturbances	<ul style="list-style-type: none"> Diabetes mellitus Dyslipidaemia Atherosclerosis

Diagnosis

There is a famous anonym which is as follows "Hormones do not decline as we age, we age because hormone decline". Diagnosis is made by assessing the signs and symptoms of androgen deficiency and also by measuring the serum testosterone or its biologic active compound. Male total testosterone levels below 300 ng/dl from a morning serum sample (most accurate measurement) are generally considered low. To confirm the low levels of Testosterone, doctors recommend repeating the measurement of morning total testosterone. A total testosterone level <200ng/dl measured by reliable assay in association with symptoms is evidence of testosterone deficiency. An early morning sample shows testosterone levels between 200 and 350 ng/dl. For proper diagnosis and management, total testosterone level should be repeatedly monitored and a free testosterone level should be measured.

Management

In Allopathic system of medicine life style modifications, behavioural therapy and the Hormone replacement therapy are the major lines of treatment for managing the symptoms of Andropause.

Understanding Andropause in the purview of Ayurveda

In *Ayurveda*, *chikitsa* is mainly meant for two purposes:

1. *Swasthasya Swasthya Rakshanam*
2. *Athurasya Vikara Prashamanam*

Rasayana and *Vajeekarana* are the two branches among *Ashtangas* of *Ayurveda* which is indented for *Swasthasya Urjaskaram* (preservation of health) and the rest of the branches focusses on the management of different *Vyadhis*. Considering the signs and symptoms of andropause, similar features can be found in a person in *Jara Avastha*. *Ayurveda* considers *Jara* or *Vardhakya* as a natural and inevitable process which comes under *Swabhavabala Pravrittha Vyadhi* explained by *Acharya Susruta*.^[9]

It is a unique mode of classification which reflects an unusual combination of two phenomenon:

1. Physiological Changes
2. Pathological Changes

In other words, it is a stage where *Sukhayu* and *Hitayu* is deranged accounting for the manifestation of multiple pathologies thereby creating a conflict of opinion among clinicians. *Rasayana* and *Vajeekarana Chikitsa* which is advised for "*Swasthasya Swasthya Rakshanam*" helps in slowing down *Jarajanya Vikaras*. Apart from this, age related disorders along with their therapeutics are found scattered all over *Samhitas* and Sanskrit literature. Broadly all the age-related disorders, being degenerative in nature can be visualized in the context of *Kshaya* and they can be grouped under three categories:

1. *Medha Kshaya*/ intellectual impairment
2. *Karma Kshaya*/ Functional incapacities
3. *Jara*/ Structural detonation

Andropause can be considered as a phase in men, which interrupts these 3 aspects.

Therefore, it can be rightly correlated to the stage of *Jara* where there is deterioration of *Dhathus*. Even though *Jara* is the final phase of *Vaya*, *Sarangadhara* has explained about the progressive loss of different factors in each decade of life.^[10] A similar thought points out to the fact that the golden age when most of the body functions are at its peak is about 25 years.

Slow but assessable decline in function starts at about 30 years of age. Studies also supports fact that testosterone starts to decline from age of 30 which may be one among factor contributing to ageing.[11] But usually, men do not feel any of symptoms until they reach an age of 60 years.

In our *Samhithas Jara* is being classified into two

1. *Kalaja*[12]
2. *Akalaja*[13]

Time is always considered in relation to the standard human lifespan. When ageing occurs in accordance with this natural timeline, it is termed as *Kalaja Jara*. However, when biological ageing advances more rapidly than chronological ageing, it is referred to as *Akalaja Jara*. Features of *Kalaja Jara* has been explained by *Acharya Susruta* as an inevitable phenomenon, where there is a progressive decline of biological factors like *Dhathu*, *Indriya Bala*, *Veerya*, *Utsaha* etc. *Vardhakya* is a *Vata* predominant stage associated with diminished metabolism. This stage associated with a *Dhathu Kshaya Avastha* contributes to *Kharatwa* and *Rookshata* of *Srotas*, thereby making the person prone to age related disorders. Considering the concept of andropause, *Kshaya* of *Sukradhathu* may be one among the factor accelerating the process of ageing. This *Kshayavastha* can be dealt with the appropriate use of *Rasayana* and *Vajeekarana Chikitsa* in which nourishment of the *Dhatus* can maintain the *Bala* of person.

But in the present scenario, where there is a drastic change in life style and environment, *Akalaja Jara* establishes soon. *Acharya Charaka* has explained it in the verse 3 of *Chikitsasthana* first chapter. The various *Nidanas* contributing to *Akalaja Jara* can be grouped under *Aharaja Hetu*, *Viharaja Hetu* and *Manasika Hetu* which can be related to improper meals at irregular timings, sedentary life style, stress etc. These factors result in the *Lakshanas* like looseness of muscles and joints, blood gets burnt, fat becomes abundant and liquefied, nonfunctioning of *Sukra Dhathu* and finally *Ojas Deteriorates*. As explained earlier these symptoms closely resemble those of andropause. Although it is a physiological process, the symptoms significantly impact the individual's quality of life. They can also be described as signs typically seen in advanced age, now appearing at an earlier stage. Here comes the role of *Ayurveda* especially as a preventive tool.

Chikitsa

Ayurveda can be used for effectively managing these conditions by adopting the measures like *Rasayana*, *Vajeekarana*, *Sodhana* etc.

Acharya Charaka has mentioned that:

तस्मादेतान् दोषानवेक्षमाणः सर्वान् यथोक्तानहितानपास्याहारविहारान् रसायनानि प्रयोक्तुमर्हतीत्युक्त्वा भगवान् पुनर्वसुरात्रेय उवाच ।[14]

Which means by avoiding all the *Aharaja* and *Viharaja Nidanas* that results in *Dosha Prakopa Avastha*, *Rasayana* can be indicated in these conditions. Definition of *Rasayana* also highlights its mode of action as;

रसायनं तन्त्रं नाम वयं स्थापनमायुर्मधोबलकरम् रोगपहरनसमर्थम् ।
(सु.सू.१/१५)

According to *Dalhana* commentary

वयःस्थापनं जरापहरणं, तारुण्यं बहुकालं स्थापयतीत्यर्थः।

This clearly explains the utility of *Rasayana* in delaying the effects of ageing and extending youthfulness to a considerable amount of time.

In other words, in this context *Rasayana* has an effective role in preventive aspect rather than a therapeutical aspect. This may be the reason that *Acharyas* have advised the use of *Rasayana* in:

पूर्वे वयसि मध्ये वा मनुष्यस्य रसायनं । (सु.चि.२७/३-४)

Rasayana should be used by the wise physician in young or middle age invariably after prior unction and evacuation. This can also be justified in the context of andropause, as the testosterone begins to decline by the age of 30. Using *Rasayana* during the middle age will help in the nourishment of *Dhathus*, thereby promoting lifespan and improving the health. Many studies conducted in vitro and in vivo supports the mode of action of *Rasayana* as an anti-ageing tool.

Amalaki Rasayana, prepared from *Amalaki* fruits, is a time-tested Ayurvedic *Rasayana* drug, widely used for the prevention or even treatment of various age-related health conditions. It significantly reduces the DNA damage in brain cells and confers genomic stability in neurons and astrocytes and at same time raising the median lifespan and starvation resistance in *D. melanogaster* model.[15] This *Rasayana* has also been revealed to be able to suppress neurodegeneration in fly models of Huntington's.

A recent study with humans aged 45 to 60 years reported an increase in telomerase activity with no discernible change in telomere length in peripheral blood mononuclear cells following *Amalaki Rasayana* administration, suggesting that this can avoid the telomeres erosion, promoting healthy ageing. In aged human participants, *Amalaki Rasayana* intake maintained, or even enhanced, the DNA strand break repair, with no toxic effects. *Amalaki* extract also exhibited neuroprotective effects from H₂O₂-induced DNA damage and repair in neuroblastoma cells. These are the proven action of *Rasayana* in ageing. This can also be interpreted as the nourishment of *Rasa Dhathu* to *Sukra Dhathu* is happening in the process thereby delaying the stages of ageing. In addition, *Medhya Rasayana* has demonstrated significant efficacy in alleviating physiological stress, which is recognised as a contributing factor in the acceleration of ageing process.[16] *Samhithas* has also mentioned about the use of *Ghritha* and *Ksheera* which acts as *Rasayana* by virtue of their *Madhura Rasa*, *Guru Snigdha Guna* and *Sheeta Virya*. Andropause is also accompanied by a set of psychological symptoms which strongly hampers with the quality of life. Therefore, *Rasayana Dravyas* provide an important support in managing the symptoms of andropause. *Swasthya Rakshanam* is not complete without mentioning *Vajeekarana*, which is the eighth branch of *Ayurveda*. *Vajikarana* is commonly meant for the management of *Sukra Doshas*. In andropause since the testosterone, which may be correlated with the *Sukra Dhathu* is affected, *Vajeekarana* will be good choice of medicine for managing the symptoms of andropause. In andropause key symptoms related to sexual functions includes loss of libido, sexual dysfunction and decreased sexual performance, primarily due to a decline in testosterone levels. Here comes utility of *Vajeekarana*. It is defined as:

वाजीकरणतन्त्रं
नामात्पदुष्टक्षीणविशुष्करेतसामाप्यायनप्रसादोपचयजनननिमित्तं तं
प्रहर्षजननार्थं च ।[17]

It can be utilized for improving the quality and quantity of *Sukra Dhathu*. This nourishment will in turn improve the quality of *Ojas* as it is considered as the essence of *Sukra Dhathu*, and thereby it helps in improving *Vyadhi-kshamatvam*. Even though *Ayurveda* has advocated *Rasayana* for nourishment of *Dhathus* and *Vajeekarana* for *Prajanana Samartham*, both are useful vice versa (*Ubhayam Ubhayartha Krit*).

Mode of action of *Vajeekarana* drugs are explained in such a way that they improve the quality of *Sukra Dhathu*. *Vagbhata* has emphatically stated that *Vrishya Dravyas* will produce *Sukra* and *Harsha* immediately due to *Prabhava* e.g. *Kshira*, *Mamsarasa*, *Yashtimadhu* etc. it has also been mentioned in classics that *Vajeekarana Dravyas* have the ability to improve the *Sukra Dhatwagni* thereby aiding in *Sukravardhanam*. Along with *Pradhanakarma*, *Poorvakarma* also plays an important role in this *chikitsa*. *Sodhana*, which is advised as a *Poorvakarma* in *Vajeekarana* helps in eliminating the toxins accumulated in the body and leads the system to normalcy. After proper *Shodana*, administration of *Vajeekarana Dravyas* which are *Madhura Rasa Pradhana*, *Jeevaniya* and *Brihmaniya* in nature will help in nourishing the *Dhathus*. This nourished *Dhathus* will be able to perform the *Dharana* of *Shareera*. And as explained above *Ojas* the ultimate essence of *Dhathus* is nourished, thereby preventing the recurrence of various disease. Apart from reproductive functions *Vajeekarana Dravyas* are also able to improve the general wellbeing of a person. This may be achieved by improving the seventh *Dhathu*, *Sukram*. Many studies have been published proving the efficacy of *Vajeekarana Dravya* in improving the general health. *Aswagandha*, one among the *Vrishya Dravya* possesses the qualities like aphrodisiac, diuretic, tonic and stimulant properties. It is a powerful adaptogen which upturns the body's suppleness towards stress. The body's defence mechanism against diseases is improved by refining cell mediated immunity.[18]

Studies conducted on *Atmagupta*, a well-known medicinal plant has proven that it significantly ameliorated psychological stress and seminal plasma lipid peroxidase levels along with improved sperm count and motility.[19] This can be summarized as proper use of *Vajeekarana Yogas* imparts qualities like good physique, potency, complexion and health. Modern research studies show that sex hormones exert their effects on other body systems also. The practice of *Vajikarana* corrects the deformities of reproductive systems and in turn balances other body functions. Thus, it can be concluded that Andropause is an actual phenomenon happening in men which is usually missed in a clinical scenario. Proper use of *Rasayana* and *Vajeekarana* can prevent the manifestation of this syndrome to a greater extent.

Also identifying the already developed condition is a challenge in the present era due to the associated comorbidities. Quoting the words of Dr. V.P Bansal, "If in an old man, a physician is unable to diagnose a particular disease based on the history, clinical examination and laboratory investigations, where multiple systems are involved and physician himself is confused; then he should think of ANDROPAUSE. [20] *Ayurveda* which strongly focusses on individual care has a lot to do in this clinical condition.

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