



## Review Article

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### A REVIEW ON CLINICAL APPLICATION OF *SUKRAKSHAYA* AND *KSHEENASUKRA LAKSHANAS* WITH RESPECT TO ANDROGEN DEFICIENCY

Duragappa Savantri <sup>1\*</sup>, Madhava Diggavi <sup>2</sup>

<sup>1</sup> PG Scholar, Department of PG Studies in Kayachikitsa, Taranath Government Ayurvedic Medical College and Hospital, Ballari, Karnataka, India

<sup>2</sup> Professor and Head, Department of PG Studies in Kayachikitsa, Taranath Government Ayurvedic Medical College and Hospital, Ballari, Karnataka, India

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#### \*Corresponding author

E-mail: dsavantri@gmail.com

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#### ABSTRACT

*Sukra* is the essence of all *Dhatus* and responsible for the both *Prakruta* and *Vikruta* function on the Body in Physiological and Pathological conditions respectively. Androgens are the male gonadal hormones and maintain the male reproductive functions. Acharya Sushruta clears that *Sukradhara kala* is present in all living organisms and all over the body as like Circulating Androgens in the blood. The dysfunction of *Sukra Dhatu* will affect all over the body by means of Many Causative factors (*Nidanas*) or Secondary affection as a result of many systemic disorders. In *Bruhatrayi* and *Laghutrayee* explained *Ksheena sukra lakshana* and *Sukrakshaya lakshana* to understand *Sukra dushti*. Here *sukra* denotes Semen plus androgen. Hyper and hypo androgenic action cause many diseases and itself will get affect by the influence of many systemic disorders so one should meticulously to be evaluated in most of the diseases even other than infertility cases for *Sukrakshaya* and androgen deficiency.

**Keywords:** *Ksheena Sukra*, *Sukrakshaya*, Androgen deficiency, *Sarvadaihika lakshana*, *Sthanika Lakshana*,

#### INTRODUCTION

*Sukra* is the *Sapta Dhatu* which is the essence part of all the *Dhatus* Specially from *Majja dhatu*<sup>1</sup> which is pervaded all over the body like the presence of invisible form of *Ghrta* in *Dhadhi*, *Taila* in *Tila*<sup>2</sup>. *Retas* or *roopadravya* is synonym to denote ejaculate, *veerya* is synonym to denote virility, *Beeja* is synonym to denote spermatozoa and *Sukra* denotes semen plus androgens in male<sup>3</sup>. In Balya avastha *Sukra* is in unexpressed form, after puberty the *Sukra* becomes active and expressed, help in the development of secondary sexual characters, masculinity and initiation of the sexual act<sup>4</sup>.

Puberty commonly refers to the maturation of the reproductive axis and the growth hormone and end organs related to reproduction. The endocrine orchestra of Male reproductive system regulates sex differentiation, virilization and hormonal changes that accompany puberty, ultimately leading to spermatogenesis and fertility.<sup>5</sup> Decrease, subnormal functioning or loss of *Sukradhatu* physiological function is called *Sukrakshaya*. Loss of virility strength, qualitative and quantitative reduction of *Sukra* is called *Ksheenasukra*. Acharyas have explained both *Sarvadaihika* and *Sthanika lakshanas* (Table 1 and Table 2) of *Shukrakshaya*<sup>6</sup>. Abnormal endocrine regulation, androgen deficiency and defects in functioning of hypothalamo-thyroid-gonadal (HTG) axis leads to the sexual dysfunctions. Here an attempt is made to clinically understand the *Ksheena Sukra* and *Sukrakshaya Lakshanas* with special reference to Androgen deficiency.

#### Concept of *Sukra* and Androgen

*Sukra* is the 7<sup>th</sup> *dhatu* which forms from the *Poshakabhaga* of *Majja dhatu* and has some physiological functions on our body

like *Dhairya* (Courage), *Chyavana* (Proper physical development), *Preeti* (Attraction towards the opposite sex may be physical or mental all these are depends on the pulsatile regulation of the androgen hormonal levels), *Dehabala* (Strength of the person due to the anabolic function of the plasma proteins), *Harsha*<sup>7</sup> (Androgen pulsatile action is also responsible for the some psychological functions)

*Sukradhatu* is responsible for normal functioning of reproductive system which is regulated by the *Apana vayu* hence the *Vridhhi* or *Kshaya* of *Sukra* leads to many diseases and person is unable to produce progeny<sup>8</sup>. The word *Ksheenasukra* derived from the two words *Ksheena* and *Sukra*. *Ksheena* refers to *Durbala* and *Sukra* is one of the *Dhatu* among *Sapta Dhatus*. *Dalhana* Commented the explanation "*Ksheena Projotpadhanena a Samartha bhavati*" as. Loss of strength to reproduce. *Ksheena* is *Daurbalya*, *Krusha*, *Kshama*, *Tanu* etc.<sup>9</sup> According to *Ayurvedeeya shabda kosha Ksheena sukra*: "*Karana Visheshair Swamaanad Alpeebutam Reto yasya Ksheena Shukram*". The word *Maana* refers to quantity or amount, the condition in which the *Maana* of *Sukra* will be low or *Ksheena*: hence as per *Dalhana* commentary, the *Ksheenasukra* as *Durbala Shukra* which cannot produce progeny like Lower androgenic level in the blood is not able to perform reproductive function.

The testes secrete several male sex hormones which are special type of fat molecules, called Androgens. And these include Testosterone and Dihydrotestosterone (DHT) are more potent androgens, androstenedione and Dehydroepiandrosterone (DHEA) will occur in small amount. Testosterone is formed by the interstitial cells of Leydig's which lie in the interstices between the seminiferous tubules<sup>10</sup>.

### Expression of Sukra and Androgen

Acharya Kashyapa Says that, the *Sukra Dhatu* will become *Sampurna paripakva* at the age of 16 years and relative expression of *Sukra karma* takes place. The wood of *Arani* contains *Agni* and, seeds of *Tila* contain *Taila* in unexpressed form but are expressed in suitable time and depending on methods of expression<sup>11</sup>. The clinical features of patients with Under androgenization such as disorders of testis development, defects of androgen synthesis, or resistance to testosterone and Dihydrotestosterone (DHT) are due to fetal period defective androgen production or action<sup>12</sup>. Any history of systemic illnesses, eating disorders, excessive exercise, social and psychological problems and abnormal patterns of linear growth during childhood should be verified for delayed Puberty in boys after the age 14 years. There are four main categories of androgen deficiency in delayed puberty; Constitutional delay of growth and puberty~60% of cases, Functional Hypogonadotropic Hypogonadism caused by systemic illness or malnutrition ~20% of cases, Hypogonadotropic Hypogonadism caused by Genetic or acquired defects in hypothalamic- pituitary region~10% of cases and Hypergonadotropic Hypogonadism secondary to primary gonadal failure (~15%causes)<sup>13</sup>.

### Sukra Kshaya Lakshana and Androgen deficiency

*Bruhatrayi* and *Laghutrayee* explain the *Sukra Dhatu* dysfunction under the heading of *Sukrakshaya* and *Ksheena Sukra*; likewise, male sexual dysfunctions should be understood with androgen deficiency with the help of clinical signs and symptoms. The *Sukrakshaya Lakshanas* are listed with clinical meaning as follows *Daurbalya* (General weakness), *Mukha shosha* (Dryness of Mouth), *Pandutva* (Paleness), *Sadana* (Malaise), *Shrama* (Dyspnea on exertion), *Klaibya* (Impotence) *Sukra Avisarga* (Unable to ejaculate), *Medra Vrushana Vedana/Toda* (Testicular Pain), *Maithuna Ashakti* (Decreased sexual power), *Chirad Praseka* (early ejaculation), *Alpa Rakta Sukra Darshane/Shonitameva Sukra* (Hematospermia), and *Medra Vrushana Doomayana* (Episodic or sudden feeling of Hotness over genitalia).<sup>14-16</sup>

Table 1: *Sarvadaihika Sukrakshaya Lakshana*

S. No.	<i>Sarvadaihika Sukrakshaya Lakshana</i>
1	<i>Daurbalya</i> (General Weakness)
2	<i>Shrama</i> (Dyspnea on Exertion)
3	<i>Mukha shosha</i> (Dryness of mouth)
4	<i>Angamarda</i> (Whole body pain)
5	<i>Pandutva</i> (Paleness)
6	<i>Sadana</i> (Fatigue)
7	<i>Bhrama</i> (Giddiness)

### Daurbalya

The word *Daurbalya* can also be understood as *Bala Kshaya*, the *Prakruta Avastha* of *Kapha* is *Bala* and in *Vikruta Avastha* it will be *Dosha* in *Kapha Kshaya Daurbalya*<sup>17</sup>. In *Oja Kshaya Daurbalya* is the one of symptom so *Kapha* and *Oja* are similar properties. *Oja* is the *Updhatu* of the *Sukra Dhatu* so we can understand that due to the *Sukra Dushti* there will be loss of physiological function of *Oja* leads to *Daurbalya*. In both *Vata Vriddhi* and *Pitta Vriddhi* we can assess *Daurbalya*<sup>18</sup>.

### Shrama

Dyspnea on exertion is due to *Daurbalya*, where patients will get fatigue even with smaller work. In day-to-day activities also, androgenic pulsatile movement's makes a person physiologically fatigue. In *Mamsagata Vata* and *Medogata Vata* fatigue can be evaluated due to the presence of Reduced Muscle bulk and strength a key symptom of Androgen deficiency<sup>19</sup> similarly *Shrama* is to be evaluated in *Rasakshaya*, *Medokshaya*, *Medovriddhi*, *Astikshaya*,<sup>20</sup> *Vatarakta Purvaroopo*, *Pandu*, *Jwara*, and other presentations.

### Bhrama

Is giddiness or dizziness. Due to the Impaired *Prakruta Dhatu Nirmana* and or *Poshana* leads to loss of qualitative and quantitative *Shukra Dhatu*. *Rajas*, *Vata* and *Pitta Prakopa* lands up in *Bhrama*. It can be evaluated in the many conditions related to *Sukra Dushti* like *Vata Vriddhi*, *Kapha Kshaya*, *Raktagata Vata*, *Medogata Vata*, *Pittavruta Vata*, *Pittavruta Prana Vayu* and *Pittavruta Udana Vayu*. In *Dhatu Vaishamyas* like *Rakta Kshaya* and *Majjakshaya*<sup>21</sup>.

### Mukha shosha

Dryness of the Mouth During sexual intercourse or after the act or regularly in his routine life due to the *Kaphakshaya* and *Rasakshaya*. The *Mukha shosha* can better understand with *Parisosha*, *Rukshata* and *Sushka*. *Ksheena Shukra* and *Shukra Kshaya* can appreciate with *Amashayagata Vata*, *Pranavrutaudanavayu*<sup>22</sup> *Mutrakshaya*<sup>23</sup>, *Tamaka Shwasa*, *Chinna Shwasa*, *Urdhva Shwasa*<sup>24</sup> and *Hridayabighata*<sup>25</sup>. HPG axis which is endocrinological pathway between the Hypothalamus Pituitary gland and Gonads plays an important role in the maintenance of androgenic hormones so due to dysfunction of this gives an image to evaluate the androgenic deficiency other than testicular dysfunction

### Angamarda

The whole-body pain is due to the *Vata Prakopa* in *Shukra Dhatu* and *Kapha Kshaya*. Can also be evaluated in *Sukravega Avarodha*, chronic *Nidranasha*, *Ahita divaswapna*, *Rajayakshma*, *Kaphaja Krimi*, *Jwara Purvaroopo*, *Pandu*, *Vataja Arsha*, *Rasagata Jwara* and in *Majjavaha Sroto Vikaras* like *Vatikamurcha*<sup>26</sup>.

### Pandutva

Paleness of the Body is due to the improper production of the *Rasa Dhatu* may leads to lack of nourishment of body, *Pitta Prakopa Vata Prakopa* and lack of *Prakruta Kapha* and present with *Pandutva*. It is one of the presentations of *Rasa Rakta Mamsa Manovaha Srotovikara* Hence while evaluating *Pandu Lakshana Sukra* related clinical assessment is needed. *Kaphaadika Sannipata Kopa* leads *Pandu* and gives scope to understand *Sukra Kshaya* and androgen deficiency. *Rasa Kshaya* and *Sukra Kshaya* both lead to *Pandutva* and clinically art to be evaluated for androgen deficiency. *Vatika Grahani* and *Kaphaja Arsha* or *Sukrashmari* and *Beejopagataja Klaibya*<sup>27</sup> also present with *Pandutva* and in Meany disorders one should meticulously to be evaluated in most of the diseases even other than infertility cases for *Sukra Kshaya* and androgen deficiency.

**Sadana**

Feeling like Overall weakness; a feeling of discomfort; a feeling like having illness due to the *Vata Prakopa* and *Kapha Kshaya*.

**Table 2: Sthanika Sukrakshaya Lakshana**

S. No.	Sthanika Sukrakshaya Lakshana
1	Medra Vedana
2	Vrushana vedana
3	Maithuna Ashakti
4	Chirat Praseka
5	Sarakta Shukra Darshanam
6	Medra Doomayana
7	Klaihya
8	Shukra Avisarga

**Medra Vedana**

Due to *Lingh Shitilita*, erectile dysfunction and forceful sexual act may lead to the *Vata Prakopa* in the *Sukravaha Srotomoola* leads to the *Medra Vedana*.

**Vrushana Vedana**

Due to the *Vata Prakopa* in the *Sukravaha Srotomoola* can leads to pain in the scrotal region it may be feeling during sexual act or after the sexual act or in any acute conditions related to scrotum and kidney.

**Maithuna Ashakti**

Weaker or reduced sexual orgasm/drive is due to the *Kaphakshaya* and *Sukra Dhatu Kshaya* and it clearly understood as Androgen deficiency most of the cases reduced testosterone level in the circulation and less utilization due to many pathological conditions.

**Chirat Praseka**

Delayed ejaculation may represent with less properties of normal *Sukra* (Both qualitative and quantitative) that may be due to *Nidana* causing *Sukra Kshaya* and *Ksheena Sukra* So due to androgen deficiency the *Sukra* becomes *Nishpaltva*.

**Sarakta Sukra Darshanam**

Hematospermia, also known as hemospermia, is presence of blood or RBC in the seminal fluid. May result from a variety of etiological factors like Infection Anomalies, tumor and trauma, iatrogenic causes, such as prostate biopsy and other urological interventions and Systemic diseases.

**Medra Doomayanam**

Feels sudden or episodic Hotness over the genital organs after the sexual act due to the over excitement *Pitta Prakopa* along with *Vayu* and May also experience during his routine work due to the *Sukra Kshaya* *Nidanas*<sup>28</sup>.

**Klaihya**

Due to the *Sukra Kshaya* feels erectile dysfunction/impotency and in case of androgen deficiency *Klaihya* is the one of the important signs for the diagnosis of male sexual dysfunction.

**Shukra Avisarga**

No ejaculation or Anejaculation is due to any Obstructive type of pathology or sexual inhibition. Lack of *Sukra Dhatu* due many *Nidanas*.

**Table 3: Clinical Signs and Symptoms of Androgen deficiency**

S. No.	Clinical Signs and Symptoms of Androgen deficiency
1	Lethargy and Fatigue
2	Gynecomastia
3	Depression
4	Reduced muscle mass and strength
5	Reduced amount of ejaculate
6	Hot flushes and sweating
7	Weaker erection and Orgasm
8	Loss of Body hair
9	Reduced bone mass, therefore increased risk of osteoporosis
10	Shrinkage of the testicles, penis, and prostate

Lethargy, fatigue and reduced physical condition mainly due to the reduced level of the Testosterone in the circulating blood and loss of metabolic function of androgen. Level of androgen is also responsible for the muscle bulk and strength. DHT is five times more potent than testosterone. DHT is primarily used by the body in the prostate, skin, and hair follicles the actions of DHT and the sensitivity of hair follicles to DHT is the cause for. Hair loss and due to the shrinkage of hair follicles and the resulting impact on the growth cycle. Due to the shrinkage of male sexual organs like testicles, penis, and prostate may reduce the amount of ejaculate as a result of weakness in the penile erection and loss of Sexual Orgasm. The male body also secretes estrogen but lower than testosterone, due to the excess estrogenic activity related lower testosterone cause the increased breast size in male. Clinically they present with loss of libido, Oligozoospermia and Erectile dysfunction. Serum estradiol and testosterone are inversely related to fracture risk in older men, serum-sex-hormone binding globulin (SHBG) shows a positive relationship. Low serum estradiol, low serum testosterone, and high SHBG predict clinical vertebral fractures, non-vertebral osteoporosis fractures, and hip fractures<sup>29</sup>.

**DISCUSSION**

Ancient Ayurvedic literature has documented *Sukra Kshaya* and *Ksheena Sukra Lakshanas* they can be broadly divided into *Sarvadaihika* and *Sthanika Lakshanas* for the purpose of clinical examination and intervention. The modern literature on androgen deficiency correlates with *Sarvadaihika Sukrakshaya* and even *Ksheena Sukra Lakshanas*.

Patients when clinically presents with *Daurbalya*, *Bhrama*, *Angamarda*, *Sadana* etc., it is invariable to meticulously think regarding general Kayachikitsa perspective of the symptoms at the same time the analytic mind of *Vajikarana* expertization will roll out the possibility of androgen deficiency *Sukra Kshaya* and *Ksheena Sukra Lakshanas* and can give the best intervention. In this regard the present review study highlights the clinical significance of androgen deficiency features with respect to *Sukra Kshaya* and *Ksheena Sukra Lakshanas*. The clinical intervention in such cases should be planned on *Pachana*, *Virechana Basti* and *Uttara basti*. *Vata Pitta Prashamana*, *Dhatu Poshana*, *Madhura Amla Tikta Vrushya Brahmana Rasayana* viz. *Shatavaryadi Ghrita*, *Ksheera Kalyanaka Ghrita*, *Phala Ghrita*, *Madhuyastyadi Ghrita*, *Vidaryadi Ghrita* etc.

## CONCLUSION

*Sukra Dhatu Vriddhi Kshaya* and *Ksheena Sukra* which are classical clinical features should also be clinically interpreted as androgen deficiency features when and wherever is possible in *Ayurvedic* specialty practice.

*Daurbalya, Shrama, Sadana, Angamarda* and *Bhrama* are *Sarvadaihika Sukra Kshaya Lakshanas* have correlation with clinical signs and symptoms of androgen deficiency features like Lethargy fatigue, Reduced muscle strength, weaker erection etc., Further clinical interventional descriptive research is needed.

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