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Aetiopathogenesis of Oligospermia (*Shukrakshaya*) in Ayurveda -A Review

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ABSTRACT

Infertility is, “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 month or more. Male infertility is one of the major agonizing issue in the present fast moving world. Oligospermia is one of the major cause of male infertility .Ayurveda classics describes about this similar conditions,such as *ashukra,alpa shukra,ksheena shukra,ksheena retas ,shukra dosha* at various contexts. *Shukra* (sperm) is one of the dhatu amongs seven dhatus, which provides courage, happiness, strength, main factor for reproduction (*garbhotpatti*). Due to modern lifestyle body tissue formation process gets vitiated which results quantitative and qualitative loss of sukra known as *shukra kshaya* i.e oligospermia. It reflects in following symptoms of *Shukra kshaya* are generalise weakness,pain in scrotum, paleness of the body, *shukra avisarga, chirat praseka, maithuna ashakti*. Infertility includes the qualitative and quantitative vitiation of *shukra dhatu*. **Aim-** Critical review on etiological factors of oligospermia. **Materials and methods:** For this study, ayurveda literature have been used, from which various references have been collected. **Conclusion** –vitiated *vata* and *pitta* dosha are responsible in the pathogenesis of oligospermia (*shukrakshaya*).Dietetic factors, habitual factors and psychological factors are responsible for oligomenorrhea (*shukrakshaya*).

Key Words *Oligospermia, Shukrakshya, Alpa-Shukra, Ksheena Shukra, Shukra*

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INTRODUCTION

Ayurveda entitled as a “Devine science” due to its origin as well as its unimaginable potency in curing the diseases and protecting the health of a healthy person, physically and mentally. Infertility is, “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 month or more of regular unprotected sexual intercourse¹.”

The need to have children is of great priority in families hence treatment of infertility has become a global concern. The couple not able to reproduce, experiences the feeling of frustration and disappointment which increase oxidative stress level, thereby worsening the condition.

Bija is one of the major factor necessary for the normal pregnancy.*Bija* means both male (Sukra - sperm) and female (artava -ovum) fertility

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factors. In Ayurvedic classics eight types of *shukradosha* are enumerated out of which *vataj kshīṇa shukra* is a disease of shukra in which both quality and quantity hampers². Among the seven dhatus (body tissues), shukra dhatu is considered as important one. *Shuddha shukra* is one of the most necessary factors for the healthy progeny³.

According to samhitas, consumption of food which aggravates vata and pitta dosha produces diminish digestive fire and at last will result in rasa-rakta dhatu dushti and shukrashaya (oligospermia)⁴. In the past two decades it was reported that, increasing exposure to toxic substance has been proposed as the mechanism for impairing the reproductive competence of the individual since many harmful chemical may harm the male reproductive system and further exposure to certain agent can lead to deleterious changes in the organ, thus lowering down the average sperm count. Nowadays oligospermia is the most common condition in both developing and developed countries. As per survey, many cases of oligospermia are diagnosed worldwide.

Use of various drugs lead to disturbance of oestrogen or androgen – mediated process further aids to worsen reproductive health and produces adverse effect on testicular histomorphology leading to impairment infertility⁵. It has been documented to have deleterious effect on sperm parameter leading to have deleterious effect on sperm parameter leading to decline in sperm count, viability and motility.

Various techniques such as in vitro fertilization (IVF), hormone replacement therapy are been used in the treatment of infertility. Drug such as sildenafil, clomifen citrate, are been widely prescribed by various practitioner across the globe for the management of male infertility. Various traditional plants are also been widely used for the infertility management⁶.

AIM

To study aetopathogenesis of oligospermia (shukrakshaya)

OBJECTIVES

To study in details about *shukrakshaya* per ayurveda and modern texts.

MATERIALS AND METHODS

Classical texts in Ayurvedic literature are reviewed

Review of Literature -

Functional Properties of Shukra⁷

Dhairya (Courage): It is related to the physical and mental awareness. In case of *klaibya rogi* it can be lost.

Chyavana (secretion): means to secrete 'or to come out', due to the *drav, chala*, etc. properties of shukra.

Preeti (desire): natural feeling or the desire to live together with the opposite gender is an attribute of *shukra* which is indirectly induced by *Ojas*.

Harsha: deriving interest and pleasure about recurring sexual acts. Chakrapani explained the

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development of sexual feelings and maintenance of erectile state of penis are unique functions of Shukra.

Dehabala: (physical fitness) as well as enthusiasm.

Table 1 Types of Shukradushti According To Acharya⁸

TYPES	DOSHA
Phenil	Vataja
Tanu	Vataja
Ruksha	Vataja
Vivarna	Pittaja
Picchil	Kaphaja
Puti	Pittaja
Anydhatu sanskrita	Rudhrantiva
Avasadi	Vataja

Vataja Shukra Dushti:⁹

As per above table no.1, Vata dosha possess *aruna* or *krushna varna*, appears as *phenil*, *tanu* in consistency, *rooksha* in nature, *alpa* in quantity, there will be either delayed ejaculation or ejaculation with pain. Shukra having no capacity to fertilize. *Vataja shukra dushti* can be correlated clinically with hemorrhagic injury, severe oligospermia, and azoospermia, obstruction of the efferent ducts.

Pittaj Sukra drusti:¹⁰

The shukra which is vitiated by pittadosha possess *pita*, *neela Varna*, hot in nature with *putigandha*, *apicchila* and patient experiences burning sensation. The hot nature of the semen and burning ejaculation indicate the acute state of inflammation.

Sushruta and *Vagbhata* explained that, *vata* and *pitta* are two factors which are involved in the causation of *ksheena shukra*.

Saamaanya Nidaanans of ksheena shukra

A. Dietetic Factors: intake of excessive dry, cold, light food, fasting, intake of excessive astringent, bitter, pungent substances, intake of sour, salty, hot, light. Diet intake of *Tila Taila* (Sesame oil), *Kulattha* (Black gram), *Sarshapa* (Mustard), *Atasi*, *Shaaka* (Green vegetable), *Matsya* (fish), *Maamsa* (Non Veg - meat), *Dadhi* (curd), *Takra* (buter milk), *Souviraka* (alcohol), *Amla Phala* (sour fruit intake)

B. Habitual Factors: *Ativyavaaya* (excessive sexual intercourse), *prajaagarana* (excess walking), *langhana* (fasting), *atiplavana* (excess swimming), *atiadhva* (excess work), *ativyayama* (excessive exercise)

C. Mental Factors-*krodha* (anger), excessive grief, excessive stress, *chinta* (worry), *bhaya* (fear), *shoka* (grief),

D. Other Factors- *rogakarshita* (suffering from other diseases), *abhighaata*, *marma abhighaata* (injury to vital parts).

Vishishta Nidana (specific causes) of Ksheena Shukra

- *Ativyavaaya* and *Ativyaayaama* – excessive sexual intercourse and exercise.
- *Asaatmya Ahaara sevana* – intake of incompatible food.
- *Akaala Maidhuna* – untimely sexual intercourse.
- *Ayoni Maituna* – coitus through any other way ie. Unnatural.
- *Amaithuna* – No sexual intercourse for longtime.

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- Intake of food which is having more *Tikta*, *Kashaaya*, *Lavana* and *Amla Rasas*, *Rooksha Guna* and *Ushna Veerya*.
- *Naarinaam Arasajnaanam* - Sexual intercourse with a woman who doesn't have interest towards sex.
- Excessive *Chinta* (thinking) and *Shoka* (Sadness)
- *Atiyoga* of *Sastra*, *Kshaara* and *Agni karma*.
- *Bhaya* (Fear), *Krodha* (Anger) and *Abhichaara Karma* (black magic).
- *Vyadhi Karshana* (Other diseases)
- *Vegadhaarana* – Suppression of urges.
- *Kshata* – injury. (Injury to *Vitapa Marma* causes *alpa Shukrata*) These are mentioned as the *ksheena shukra vishishta nidaana*.

Samprapti (pathogenesis)

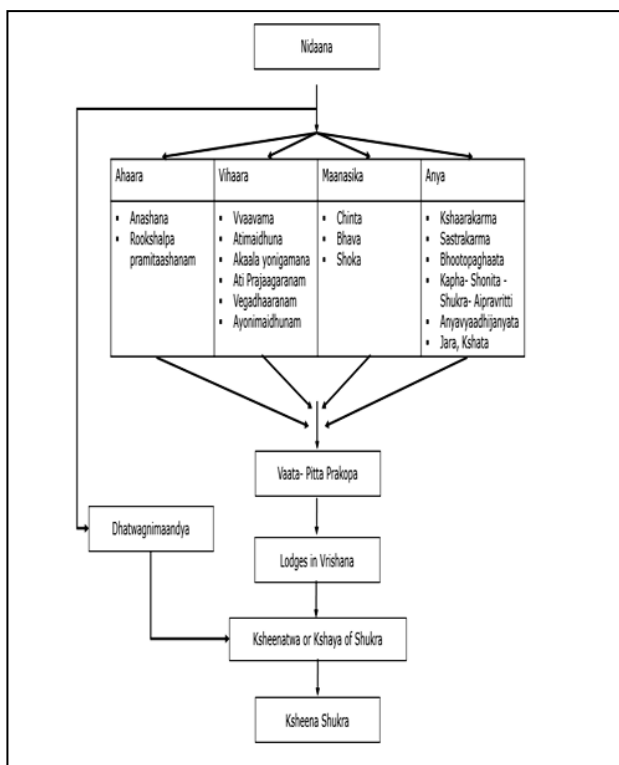


Chart 1 Samprapti of Ksheena Shukra

As per shown in chart no 1, due to various causes, the vata and pitta are going to be vitiated. These vitiated *doshas* further lodges into the *vrishana* (testies) i.e. the *shukravaha srothomoola*. Then, vitiation leads to *ksheena avastha* of *shukra*. *Dhaatwaagnimaandya* hampers the production of *Shukra* which may leads to the *ksheena Shukra* (oligospermia).

Sampraapti Ghatakas

Dosha –vata-pitta

Dhatu- Rasa, Majja, Shukra

Srotas- Rasavaha, Majjavaha, Shukravaha

Lakshanas of shukra kshaya ¹¹

Dourbalya - Due to *Shukra Kshaya* the *Ojokshaya* also occurs. This further leads to *dourbalya*. *Kapha dosha* and *Shukra dhaatu* are having the *ashraya – Ashrayi Sambandha*. So that whenever *Shukra Kshaya* occurs there will be *Kapha Kshaya* also. *Praakruta Sleshma* is called as *Bala* and its *vikrutavasta* is *Mala*. So *kaphakshaya* will result into *dourbalya* also takes place.

Shrama- Due to *Dourbalya*, the patient may not be able to do the work. On little work there will be tiredness.

Asya Shosha- Dryness in the mouth is due to *kaphakshaya* and *rasakshaya*

Angamarda- Pain all over the body is due to the aggravation vata which is formed, as a resultant of *dhaatukshay* occurs i.e especially *Shukra Kshaya*.

Paandutva- Paleness of the body is a resultant of the improper nourishment of the body due to lack
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of kapha, aggravation of vata and pitta takes place and due to these vitiation, the *rasa dhaatu* gets vitiated which further leads to *Paandu*.

Sadana- Feels like joints are having less strength because of the kaphakshaya occurred.

Bhrama- Giddiness is due to the aggravation of vata and pitta as well as it may, be due to the improper nourishment of the dhaatu.

Shadvidh klaibya-¹²

Charaka told four types of Klaibya as follows.

- *Bijopaghataja*,
- *Dvajopaghataj*,
- *Jarajanya*,
- *Shukrakshayaja*.

General symptoms of Klaibya

Inability to do coitus due to loss of erection, even if he has desire and the partner is lovable and obedient.

Bijopaghataja Klaibya-

- It is due to the intake of cold, excessive dry, less in quantity, incompatible, grief, stress, worry, excess indulgence in sex, diminution of dhatu etc.
- The person develops paleness (*pandu varna*), weakness (*durbala*), cardiac disease (*hriday roga*), *pandu roga* (anemia), *tamaka* (giddiness), *kamala* (jaundice), vomiting (*chardi*), diarrhea (*atisara*), pain (*shula*), cough (*kasa*), fever (*jvara*).

Dvajopaghataja Klaibya

Excessive intake of *Amla*, *Lavana*, *Kshara*, *Virudha*, *Asamya bhojana*, drinking excess water, *Vishama*, *Pishta*, *Guru bhojana*, curd, milk, anup

mamsa (dietic factors), emaciation after disease, coitus with kanya, other than vaginal coitus, sex with chronic ill, menstruating, vaginal disorders, vagina with foul odor, discharge, coitus with young females, animals, injury to penis, lack of cleaning penis, wounds by weapon, teeth, nail, strikes by wood, excessive use of awry insects on penis, withholding of ejaculation results in *klaibya*. (traumatic factors)

It is of five types

- *Vataja*, *Pithaja*, *Kaphaja*, *Raktaja*, *Sannipaja*
- *Vataja dvaja bhanga* is presented with swelling, pain and redness of penis.
- *Pithaja dvajabhanga* is found with severe eruptions and inflammation of penis.
- *Kaphaja dvajabhanga* is of instant growth of *Mamsa*, wound, discharges like rice water, blackish, reddish, ring formation and hardening of penile circumference.
- *Raktaja dvajabhanga* is associated with fever, thirst, giddiness, fainting, vomiting, reddish, blackish, bluish and *avila lohita* discharges.
- *Sannipataja dvaja bhanga* is with severe pain similar to the burn in Bladder, Testis, *Sivani*, *vankshana*. Occasional slimy and pale discharges, slow forming swelling, moist feeling, take time to suppurate and may subside quickly, worm formation, get moist and foul odour, sloughing of glans, scrotum.
- *Jarasambhavaja klaibya*-Shukrakshaya occurs during old age due to *rasadi dhatu kshya*,

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not taking *avrishya* food and gradual, diminution of strength, potency, sense organ, not taking enough food, exhaustion, cause *klaibya* in aged. Thus the **old age** is affected with *ksheena dhatu*, weakness, loss of complexion, energy and easily caught by diseases.

- **Kshayaja klaibya**-Excessive **grief**, anger, worry, stress, intake of very dry food by emaciated persons, fasting by *durbala prakriti*, *asatmya bhojana* leads to diminution of *Rasa* in *Hridaya* and gradually *rakta* etc *dhatu*s gets diminished and at the end *shukrakshaya* (oligospermia) results and if the person indulges in excessive coitus due to enhanced desire also cause decreased *shukra* in no time.

MODERN REVIEW

PROPERTIES OF SEMEN

- Specific gravity: 1.028

Composition of Sperm¹³

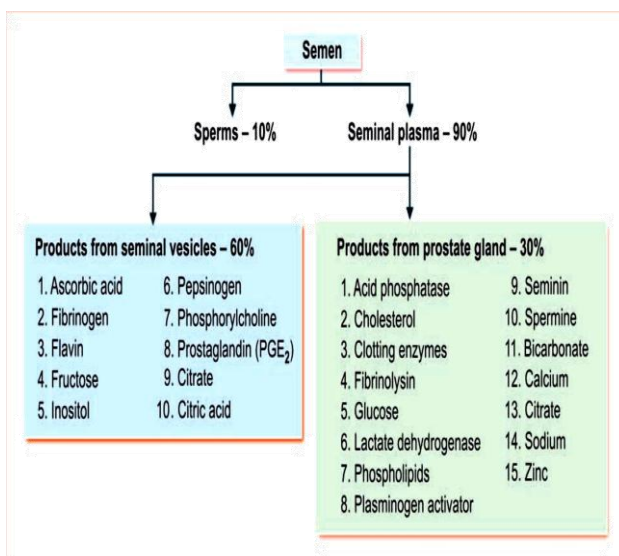


Chart 2 Composition of Sperm¹³

- Volume: 2 mL to 6 mL per ejaculation
- Reaction: It is alkaline with a pH of 7.5. Alkalinity is due to the prostate fluid.

Minimum required qualities of semen for fertility are:

- Volume of semen per ejaculation must be at least 2mL
- Sperm count must be at least 20million/mL
- Number of sperms in each ejaculation must be at least 40million
- 75% of sperms per ejaculation must be alive
- 50% of sperms must be motile
- 30% of sperms must have normal shape and structure
- Sperms with head defect must be less than 35%
- Sperms with midpiece defect must be less than 20%

Sperms with tail defect must be less than 20%.

MALE INFERTILITY

Derivation of the term Oligospermia or Oligozoospermia¹⁴

The term Oligospermia is derived from Oligo + sperm + IA. i.e. "Oligo" means "less", "sperm" means "spermatozoa", "ia" indicates a condition or a disease, where less sperm count is present.

Definition of the term Oligospermia or Oligozoospermia¹⁵

WHO defined, the condition where the sperm concentration is less than 20 million/milliliter

Synonyms

- Oligospermia
- Oligo-zoospermia

CAUSES OF OLIGOSPERMIA

Pre-testicular causes¹⁶

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Main causes-poor hormonal support and poor general health.

1. Drugs, alcohol, smoking - This factors causes aggrivation of vata –pitta *dosha*.
2. Strenuous riding (bicycle riding, horseback riding)- This factors causes aggrivation of *apan vata*
3. Medications, including androgens –due to sharp and penetrating nature aggravates vata pitta dosha

Testicular factors

1. Age- In old age, due to depletion in dhatu leads to low sperm count.
2. Genetic defects on Y chromosome micro deletions

Abnormal set of chromosomes

Klinefelter syndrome- compared to *Sahaja Vyadhi* because these may due to the *Beeja Dushti*.

3. Cryptorchidism -*Sahaja Vyaadhi* (congenital) where the testis is not descended in to scrotum.
4. Varicocele - It is a collection of dilated veins in the spermatic cord with occasional pain and discomfort. It can be compared to the *Shukravaha Srothorodha* or *Avarana* of *Apaanavaata* with *Rakta*.

Post-testicular causes

1. Vas deferens obstruction- This can be compared to the *Shukravaha Srothorodha*. It may be due to the *shukrsasmari* also. But this *shukraashmari* formation is a *lakshana* of the *shukra vridhi*.

2. Lack of Vas deferens, often related to genetic markers for Cystic Fibrosis- All these Factors can be compared to *sahaja*.

3. Infection, e.g. Prostatitis- Infections are even though considered as *Tridosha*, predominance of *Pitta* and *Vata* should be considered more specifically based on the signs and symptoms of the specific infections. So the *Vata* and *Pitta* are the main *Doshas* which is involved in the *Ksheena Shukra*. Especially the Prostatic secretions mixes with the semen and the *Pitta* and *Vata* vitiated in the *Ashtila* causes the vitiation of entire *Shukra* after mixing with it.

4. Ejaculatory duct obstruction- It can be explained as mentioned in Vas Deference obstruction.

Systemic diseases which causes Oligospermia:

AIDS lowers the degree of spermatogenesis. Renal failure and Cirrhosis of liver causes low levels of Testosterone.

Addictions which causes Oligospermia:

Alcohol is the most important **Leyding** cell toxin. As many as 80% of **these men are sterile seminiferous tubes atrophy, loss of sperm or normal sperms**. Intake of alcohol may decrease the semen quantity. Tobacco addicts **have** sperm count below normal.

Drugs which causes Oligospermia:

Antibiotics like Ampicillin, Erythromycin and cephalixin causes oligospermia.

Immunological causes:

Testicular failure occurs in autoimmunity in which endocrine deficiencies coexists.

Psychological causes:

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Increased stress conditions also produce low quality of semen.

Thermal causes:

The temperature of scrotum will be raised in conditions like Vericocele, Hydrocele and Filariasis. Vericocele causes disruption in later stages of sperm maturation. Moreover working near hot zone and wearing of tight undergarment more than 15 hours / day may also depress the spermatogenesis leads to Oligospermia.

Environmental factors:

Table 2 Differential Diagnosis of Oligospermia

Sr .no	Oligospermia / Oligozoospermia	Azoospermia	Asthenospermia
1	Sperm Count less than 20 million / ml but not 0 million / ml	Sperm count is 0 million / ml	Sperm motility is less than 50%

As per table no.2, A typical sperm count is more than 15 million sperm per 1 milliliter of semen. Besides being known as Sperm Count less than 20 million / ml but not 0 million / ml, oligospermia is also called oligozoospermia.

DISCUSSION

Thus male infertility explained in *ayurveda* cover a broad area of causative factors commencing from the *Bija* (Sperm), its developmental, functional, genetic causes, dietetic, psychological, pathological, senile factors which may result in impotency, infertility or both.

Shukra dhatu is qualitatively and quantitatively affected in oligospermia. Acharya Charaka has explained Shukrakshaya in *vajikaran adhyaya*. The causes given in classics are applicable in this disease in which main doshas are involved vata and pitta in Samprapti

Estrogens in shampoos, creams, lotions, *Iodised salt*, Octyl phenol a breakdown product of detergent used in paper, plastic, textile industry mimics *estrogen* & is found in water, meat, Pesticides, insecticides, fungicides, in food & water.

Etiopathogenesis of Oligospermia

Many causes have been explained in the Nidaana chapter under the heading of causes of Oligospermia.

of (oligospermia) *shukrakshaya*. It is observed that dietetic factors like pungent, bitter, salty, astringent food, tobacco Chewing tobacco, alcohol consumption, smoking, hot and spicy food, excessive exertion leads to qualitative and quantitative *kshaya* of *shukra* (oligospermia). Also psychological factors like mental stress, over thinking, anger also leads to oligospermia. Patients having vata and pitta as main body constituent are more prone to *shukra kshaya* as they have these two *dosha* are in large quantity in their body and slight diet which can cause aggravation will lead to *shukrakshaya* (oligospermia). Excessive smoking reduced testosterone production as well as nicotine inhibits LH secretion in males. It was also stated that due to smoking there is higher level of circulating estradiol which potentially impacts spermatogenesis.

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Consumption of alcohol leads to loss of immunity and *Ojakshaya* further leads to *shukrakshaya*. According to previous studies the testes have been shown to be highly susceptible to ethanol. Alcohol impairs testosterone production and also hampers hypothalamic pituitary gonadal axis which results in decreased spermatogenesis as well as sperm count. Impaired sperm motility was noted in chronic alcohol users. *Ratrijagaran* leads to *vata prakopa* which increases dryness alters quality and quantity of *shukra* results in oligospermia.

(mental stress), excessive anger are main causative factors of *shukrakshaya*. All these factors were accountable to hamper normal values of Semen volume, Sperm count, Sperm motility.

CONCLUSION

Bijopaghataja klaibya is *nirbija*, this condition may be considered as azoospermia or aspermia. The *Shukra alpata* is observed in *ksheena shukra*, *vataja shukra dosha*, *jara-sambhavaja klaibya*, *kshayaja klaibya*, *shukrakshayaja klaibya* can be compared with Oligospermia.

Dietetic Factors like excessive salty, bitter, pungent, alkaline food and habitual factors like excessive smoking(*dhumrapan*), consumption of alcohol (*madyasevan*), no sleeping at night(*ratrijagaran*), excessive intercourse(*ativyvaya*), over physical exertion (*sharirika shrama*) the main causative factors of oligospermia(*shukrakshaya*). Factors like working near or in hot zone, tobacco chewing, riding, plays main role in oligospermia(*shukrakshaya*). Psychological factors like excessive worry, *manasik shrama*

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