

CLINICAL EVALUATION OF GUDAKUSHMAND IN SHUKRADHATUKSHAYA W.S.R. TO OLIGOSPERMIA

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ABSTRACT

Shukra Dhatu is the last & best extract *Dhatu* of our body which is also nourished by the *Ahara* taken. *Shukralpata* or *Shukrakshaya* is considered as a semen insufficiency. *Daurbalya* (Generalized weakness), *Panduta (Pallor)*, *Agnisaada* (Decreased digesting capacity), *Shrama (Fatigue)*, *Mukhashosha* (Excessive feeling of thirst), *Timira Darshana* (Black-outs), *Medhra-Vrishana Vedana* (Pain in scrotum & penis), *Medhra Dhumayana* (Burning sensation in penis & urethra), *Chirat Praseka* (Delayed ejaculation), *Alpa Rakta-yukta Shukra Pravritti* (Blood mixed ejaculation), *Shukra Avisarga* (Absence of ejaculation), *Rati Anabhimukhata* (Loss of libido) and *Maithune Ashakti* (Problematic or not satisfactory coitus) are described as the main symptoms of *Shukra Dhatu Kshaya* in *Ayurveda* classics. *Shukrakshaya* can closely be correlated with Oligospermia.

Oligospermia is defined as a male reproductive system disorder associated with low sperm concentration. *Shukra Dhatu Kshaya* & Oligospermia are not the same identically but Oligospermia seems a part of *Shukra Dhatu Kshaya* which shows quantitative vitiation of *Shukra Dhatu*. *Ayurvedic* principles say that a drug possessing similar properties of a *Dhatu* can nourish that particular *Dhatu* early & effectively than others in the presence of *Deepan-*

Paachan drugs. Present clinical trial is carried out by using an *Ayurvedic* formulation – *Gudakushmand*, in the diagnosed cases of *Shukra Dhatu Kshaya*.

KEYWORDS: *Shukra Dhatu Kshaya*, Oligospermia, *Gudakushmand*.

INTRODUCTION

Ayurveda is a holistic science which states that our body is made up of *Dosha*, *Dhatu* & *Mala*. *Shukra Dhatu* is the last & best extract *Dhatu* of our body therefore it is considered as an extreme *Dhatu*.^[1] *Shukra Dhatu* is nourished by the *Aahar* taken as like all other *Dhatu* are nourished.^[2] Various pathophysiological aspects of *Shukra Dhatu* are described in *Ayurvedic* classics. *Dhairya* (Patience & courage), *Chyavana* (Timely ejaculation), *Harsha* & *Preeti* (Sexual desire) & *Dehabala* (Physical strength) are the main functions of *Shukra Dhatu*.^[3] *Beejartham* or *Garbhotpadan* (Production of off-springs) is considered the best & primary vital function of *Shukra Dhatu*.^[4]

Daurbalya (Generalized weakness), *Panduta* (*Pallor*), *Agnisaada* (Decreased digesting capacity), *Shrama* (*Fatigue*), *Mukhashosha* (Excessive feeling of thirst), *Timira Darshana* (Black-outs), *Medhra-Vrishana Vedana* (Pain in scrotum & penis), *Medhra Dhumayana* (Burning sensation in penis & urethra), *Chirat Praseka* (Delayed ejaculation), *Alpa Raktayukta Shukra Pravritti* (Blood mixed ejaculation), *Shukra Avisarga* (Absence of ejaculation), *Rati Anabhimukhata* (Loss of libido) and *Maithune Ashakti* (Problematic or not satisfactory coitus) are the principle signs & symptoms of *Shukra Dhatu Kshaya*.

Insufficiency of semen is called *Shukrak Dhatu Kshaya* which can be correlated closely with Oligospermia which finally leads to infertility in males. Oligospermia is a disorder of male reproductive system, in which there is quantitative reduction of sperms (< 20 million/ml). *Shukra Dhatu Kshaya* and Oligospermia are not exactly one and the same. But Oligospermia is a part of *Shukra Dhatu Kshaya* showing quantitative vitiation of *Shukra Dhatu*.

AIMS AND OBJECTIVES

1. To understand the condition *Shukra Dhatu Kshaya*.
2. Clinical evaluation of an *Ayurvedic* formulation - '*Gudakushmand*' - in *Shukra Dhatu Kshaya* w.s.r. to Oligospermia.

MATERIAL AND METHODS

A thorough review has been made on *Shukra Dhatu Kshaya* by the help of various classical *Ayurvedic* texts, e.g. *Charaka Samhita*, *Shushruta Samhita* etc. along with their commentaries. Clinical trial was conducted on 30 diagnosed cases of *Shukralpata* (Oligospermia). Inclusion criteria followed for the selection of patients was as following –

- a. Adult male patients between the age group of 20-60 years.
 - b. Diagnosed & confirmed cases of *Shukra Dhatu Kshaya* (having signs and symptoms of *Shukra Dhatu Kshaya*) &/or Oligospermia (having < 20 million/ml sperm count along with low volume of semen in semen analysis).
 - c. Patient not taking any other medication for *Shukra Dhatu Kshaya* or Oligospermia.
- Gudakushmand* was selected for the trial & was administered 10 grams twice daily empty stomach with the *Anupana* of sugar mixed lukewarm cow's milk for 2 months to evaluate its efficacy in *Shukra Dhatu Kshaya* w.s.r. Oligospermia.

Assessment criteria were developed in the term of laboratory and subjective parameters as following –

a) Laboratory parameters

i. Semen analysis

S. No.	Criteria
1.	Volume (in ml)
2.	pH
3.	Liquefaction time (in minutes)
4.	Sperm count (in million/ml)
5.	Sperm motility (in the terms of RLP, SLP, NP, IM)

- ii. Serum testosterone level – Normal reference range for males & females was 6.4-31.6 & 0.2-4.4 nmol/liter serum testosterone respectively (for available ELISA kit).

b) Subjective parameters1) *Daurbalya* (Weakness or General Debility)

No weakness and he can perform routine work effectively	0
Slight weakness but he can do routine work normally	1
Slight weakness and feel difficulty in performing routine work	2
Marked weakness and can't perform his routine work	3
Marked weakness and can't do any type of work	4

2) *Panduta* (Paleness or Pallor)

Absent	0
Present in palpebral conjunctiva only	1
Also presenting in nails, tongue and lips	2
Also presenting in palms and face	3
Present on whole body	4

3) *Agnisada* (Decreased capacity of digesting the food properly)

Presence of all symptoms of <i>Aharapachana</i> & equally willing towards the all <i>Bhojya Padartha</i>	0
Presence of any 75% symptoms of <i>Aharapachana</i> & willing towards some specific <i>Ahara</i> or <i>Rasavishesha</i>	1
Presence of any 50% symptoms of <i>Aharapachana</i> & willing towards only one <i>Rasa</i> among <i>Katu, Amla</i>	2
Presence of any 25% symptoms of <i>Aharapachana</i> & willing only to most liking food, not to others	3
Absence of all symptoms of <i>Aharapachana</i> & totally unwilling for food	4

4) *Shrama* (Fatigue or Tiredness)

No tiredness with any type of exertion	0
Tiredness only with excessive exertion	1
Tiredness with moderate exertion	2
Tiredness with mild exertion	3
Tiredness even without any exertion	4

5) *Mukha Shosha*

Feeling of thirst 7-9 times/24 hours, either/or Intake of water 5-7 times/24 hours with quantity 1.5-2 liters/24 hours	0
Feeling of thirst 9-11 times/24 hours, either/or Intake of water 7-9 times/24 hours with quantity 2-2.5 liters/24 hours	1
Feeling of thirst 11-13 times/24 hours, either/or Intake of water 9-11 times/24 hours with quantity 2.5-3 liters/24 hours	2
Feeling of thirst 13-15 times/24 hours, either/or Intake of water 11-13 times/24 hours with quantity 3-3.5 liters/24 hours	3
Feeling of thirst > 15 times/24 hours, either/or Intake of water > 13 times/24 hours with quantity > 3.5 liters/24 hours	4

6) *Timira Darshana* (Black outs)

No black outs	0
Occasional black outs for short duration	1
Occasional black outs for small duration leading to fainting	2
Frequent black outs for small duration leading to fainting	3
Frequent black outs for longer duration & leading to fainting	4

7) *Medhra-Vrishana Vedana* (Pain in scrotum and penis)

No pain	0
Occasional mild pain during coitus and lasts after coitus	1
Frequent mild pain during coitus and lasts after coitus	2
Persistent mild pain during coitus and long lasting	3
Persistent severe pain during coitus and long lasting	4

8) *Medhra Dhumayana* (Burning sensation in penis or urethra)

No burning sensation	0
Occasional burning sensation during ejaculation	1
Occasional burning sensation during and after ejaculation	2
Constant burning sensation during and after ejaculation	3
Constant severe burning sensation not showing any relief after ejaculation	4

9) *Chirat Praseka* or *Alpa-Rakta-Yukta Shukra Pravritti* or *Shukra Avisarga* (Delayed or blood mixed or no ejaculation)

Timely ejaculation in all sexual encounters	0
Delayed ejaculation in 50% of sexual encounters	1
Delayed ejaculation in 25% of sexual encounters	2
Delayed and blood mixed ejaculation	3
No ejaculation	4

10) *Rati Anabhimukhata* (Lack of sexual desire)

Normal sexual desire	0
Lack of sexual desire	1
Sexual desire only on demand of partner	2
No sexual desire at all	3
Anti-sexual desire or desire against the sexual activity	4

11) *Maithune Ashakti* (Problematic or not satisfactory coitus)

No problem in coitus	0
Able to perform satisfactory coitus once in a day	1
Able to perform satisfactory coitus at the interval of 1 week	2
Able to perform satisfactory coitus at the interval of 2 week	3
Not able to perform a satisfactory coitus	4

DISEASE REVIEW

Shukra Dhatu Kshaya is an acquired abnormality of *Shukra Dhatu* in which qualitative as well as quantitative reduction in *Shukra Dhatu* occurs. Vitiating *Vata* and *Pitta* are the main culprits. Vitiating *Dosha* causes *Jatharagni Vaishamyā* ending in *Aamotpatti* which causes *Rasavaha Srotorodha* & progressive evaluative metamorphosis of *Dhatu* is hampered leading to poor nourishment of *Shukra Dhatu*. If *Khavaigunya* is produced in the *Shukravaha Srotas*

due to the *Nidana Sevan* responsible for *Shukra Dhatu Kshaya*, localization of vitiated *Dosha* take place & facilitates *Dosha-Dushya Sammurchana* finally manifesting in *Shukra Dhatu Kshaya*. This type of semen insufficiency can be correlated with Oligospermia which finally leads to infertility in males. *Daurbalya* (Generalized Weakness), *Panduta* (Pallor), *Agnisada* (Low digestive power), *Shrama* (Fatigue), *Mukha Shosha* (Dryness of mouth), *Timira Darshana* (Black outs), *Medhra-Vrishana Vedana* (Pain in scrotum and penis), *Medhra Dhumayana* (Burning sensation in penis or urethra), *Chirat Praseka* or *Alpa-Rakta-Yukta Shukra Pravritti* or *Shukra Avisarga* (Delayed or blood mixed or no ejaculation), *Rati Anabhimukhata* (Loss of libido) and *Maithune Ashakti* (Problematic or not satisfactory coitus) are the signs and symptoms of *Shukra Dhatu Kshaya*.^[5,6,7,8]

Oligospermia is defined as a male sexual disorder associated with low sperm concentration (<20 million/ml of semen)^[9]. *Shukra Dhatu Kshaya* & Oligospermia are not exactly one and the same. But Oligospermia is a part of *Shukra Dhatu Kshaya* showing quantitative vitiation of *Shukra Dhatu*. *Sukra Dhatu Kshaya* can be effectively compared with Oligozoospermia when we correlate it with low sperm count.

DRUG REVIEW

Kushmand (*Benincasa cerifera* Savi) is the main ingredient of the formulation - *Gudakushmand*. *Shweta jeeraka* (*Cuminum cyminum* Linn.), *Sukshmaila* (*Elettaria cardamomum* Maton), *Brihadela* (*Amomum subulatum* Roxb.), *Chitraka* (*Plumbago zeylanica* Linn.), *Chavya* (*Piper retrofractum* Vahl.), *Pippali* (*Piper longum* Linn.), *Shunthi* (*Zingiber officinale* Rosc.), *Daalchini* (*Cinnamomum zeylanica* Blume), *Tejapatra* (*Cinnamomum tamala* Nees), *Dhanyaka* (*Coriandrum sativum* Linn.), *Maricha* (*Piper nigrum* Linn.), *Gajapippali* (*Piper retrofractum* Vahl.), *Shringataka* (*Trapa natans* Linn.), *Kasheruka* (*Scirpus grossus* Linn. f.), *Trapusha* (*Cucumis sativus* Linn.) & *Taalmastaka* (*Borassus flabellifer* Linn.) are used as *Prakshepa Drvaya*. Cow's *Ghee*, Sesame oil, *Guda* (Jaggery) & *Madhu* (Honey) are used to give the formulation an *Avaleha* form basically.^[10]

ASSESSMENT OF THERAPY

Assessment of therapy using laboratory parameters (By applying Student's paired t-test)

Parameter	Mean		% of improvement	p-value	Result
	BT	AT			
Volume	1.9	2.5	31.58%	< 0.0001	Extremely significant
Ph	7.69	7.94	03.25%	< 0.0010	Highly significant
Liq. Time	26.7	31.1	16.48%	< 0.0100	Moderately significant

Sperm count	12.6	23.5	86.51%	< 0.0001	Extremely significant
RLP	30.7	39.2	27.69%	< 0.0001	Extremely significant
SLP	22.5	27.3	21.33%	< 0.0010	Highly significant
NP	16.3	13.4	17.79%	> 0.0500	Not significant
IM	30.0	20.0	33.33%	< 0.0001	Extremely significant
S. Testosterone	13.9	19.9	43.16%	< 0.0001	Extremely significant

Assessment of therapy using subjective parameters (By applying Wilcoxon signed rank test)

Parameters	Mean		% of Relief	p-value	Results
	BT	AT			
<i>Daurbalya</i>	2.00	0.64	68.00%	<0.0001	Extremely significant
<i>Panduta</i>	1.53	1.00	34.64%	<0.0500	Mild significant
<i>Agnisada</i>	1.62	1.00	38.27%	<0.0100	Moderately significant
<i>Shrama</i>	2.41	1.14	52.70%	<0.0001	Extremely significant
<i>Mukhashosha</i>	1.87	1.33	28.88%	<0.0100	Moderately significant
<i>Timira Darshana</i>	1.19	0.69	42.02%	<0.0100	Moderately significant
<i>Medhra-Vrishana Vedana</i>	1.33	0.67	50.37%	>0.0500	Not significant
<i>Medhra Dhumayana</i>	1.60	0.30	81.25%	<0.0100	Moderately significant
<i>Chirata Praseka</i>	1.12	0.37	66.96%	<0.0500	Mild significant
<i>Rati Anabhimukhata</i>	1.25	0.40	68.00%	<0.0001	Extremely significant

DISCUSSION

Cow's Ghee,^[11,12] Sesame oil,^[13,14,15] Guda,^[16,17] & Madhu,^[18,19] are *Madhura* in *Rasa* & *Vipaka*. Guda, Ghrita & Madhu are *Shita* in *Virya*. Ghrita & Tail are *Snigdha*. *Madhura*, *Shita* and *Snigdha* are the *Guna* of *Shukra* also. Hence, they will nourish the *Shukra Dhatu* effectively according to the *Samanya-Vishesha* theory of *Ayurveda*.

Tail is the best *Vatahara*, Ghrita & Guda are good *Vata-pittahara* and Madhu is said *Tridosahara*. We have discussed earlier that *Shukra Dhatu Kshaya* is a *Vata-Pitta* predominant condition. So these *Dravya* will work in *Shukra Dhatu Kshaya* by subsiding the both *Vata & Pitta Dosh*.

Ghrita & Tail are *Agnideepana Dravya* also. *Agnideepana* is strongly recommended for desired action of a formulation. Here the role of *Agnideepana* is much important for the *Dhatu Kshaya* point of view. Madhu have *Kapha-Chedana* property by which it helps in removing *Kapha* causing *Mandagni*.

Ghrita is *Rasayana & Vrishya* while Guda is *Kapha-Rakta-Mamsa-Meda-Majja & Shukra Vardhaka*. So their effectiveness in *Shukra Dhatu Kshaya* can be observed directly.

Kushmanda.^[20] has *Madhura Rasa-Vipaka & Shita Virya*. It is *Brimhana, Vrishya, Paushtika & Balya*. It is *Sarvadoshahara*, especially *Vata-Pittahara*. So it is clear that it can work in

Shukra Dhatu Kshaya by *Samanya-Vishesh* theory & *Samprapti Vighatana* by subsiding the *Dosha* indulged in creating the condition *Shukra Dhatu Kshaya*.

It has *Bastishodhaka* property & indicated in *Mutrashmari*, *Mutakricchra*, *Mutraghata* & *Prameha* also. So it is useful in *Shukra Dhatu Kshaya* because of its clearing action on *Shukravaha* & *Mutravaha Srotas*. It is *Agnideepaka* too.

Out of all 16 *Prakshepa Dravya*.^[21] - 11 are *Katu Rasa Pradhana*, 10 are *Ushna Virya*, 9 are *Katu Vipak* & 8 are having *Laghu-Ruksha Guna*. If we talk about their action - 10 are acting as *Kapha-Vata Shamaka*, *Agnideepaka* & *Aamapachaka Dravya*.

Katu Rasa-Vipaka, *Ushna Virya*, *Vata-Kapha* subsiding nature & *Aamapachaka* action - all these help in improving the *Jatharagni* as well as *Dhatvagni*.

Time taken in formation of *Shukra Dhatu* depends upon the status of *Agni* & *Aphrodisiac property of dravya* used also. A man with good & strong *Agni*, will produce *Shukra Dhatu* early in comparison to the other man with weak & bad *Agni*.^[22] *Aphrodisiacs* produce *Shukra Dhatu* immediately by their own *Prabhav*.^[23] Hence, the proper *Agni* is an essential requirement for *Shukra Dhatu Poshana* by a formulation & daily diet to cure *Shukra Dhatu Kshaya*.

Out of all 16 *Prakshepa Dravya* - 4 are *Madhura Rasa-Vipaka*, *Shita Virya* & *Pitta Shamaka*. Out of these, 3 are having *Guru Guna* also. *Shringataka*, *Kasheruka* & *Taalmastaka* are *Vrishya* & *Shukrala*. *Shringataka*, *Taalmastaka* & *Trapusha* are *Mutrala*. *Shringataka* is *Balya*, *Paushtika* & specially indicated in *Shukradushti*, *Shukradaurbalya* & *Klaibya*. *Taalmastaka* is *Brimhana* & *Balya*. *Trapusha* is indicated mainly in *Mutrakricchra*. *Daalchini* is *Vata-Pittahara*, *Balya*, *Shukral* & *Vastishodhaka*. Thus these 4 drugs can help in nourishing the *Shukra Dhatu*.

Madhu is a good *Yogavahi Dravya*, which is also added to the trial drug at the end when preparing it. Because of this *Guna*, *Madhu* cause other ingredients to perform their action effectively.

Sugar,^[24,25] mixed cow's milk,^[26,27] was prescribed as *Anupana*. Both the sugar & milk are *Madhura*, *Guru*, *Snigdha*, *Shita* & *Vata-Pittahara*. So they are useful in *Ksheenashukrata*. Milk is best *Jeevaniya Dravya* & its regular use shows *Rasayana*, *Brimhana*, *Vrishya* & *Balya* effect.

So the probable mode of action of the trial drug can be better understood by two basic theories of *Ayurveda* – *Samanya-Vishesha Siddhanta* & theory of *Agni* regarding *Dhatu Poshana*. According to these theories, it may be said that the trial drug is able to increase the quality & quantity of *Shukra Dhatu*.

CONCLUSION

1. *Vitiated Vata* and *Pitta Dosha* are the main culprit of *Shukra Dhatu Kshaya* because of its causativity of quantitative and qualitative defect in seminal parameters.
2. *Shukra Dhatu Kshaya* may be taken as either low volume of ejaculate or low sperm count or low serum testosterone levels.
3. *Gudkushmand* is a well tolerated therapeutic agent without causing any unwanted ill effect.
4. Oral administration of *Gudakushmand* in the dosage of 10 grams twice daily with the *Anupana* of sugar added cow's milk can be preferred as a safe therapeutic agent in the management of *Shukra Dhatu Kshaya* or Oligospermia.

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