



Ayurvedic management of male infertility Due to Oligozoospermia(Ksheena shukra dushti) with Uttarabasti and vrushya Rasayana yogas - A comparative clinical study

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ABSTRACT

Sexual health is an important part of overall human health. Male infertility has received less attention, even though it is widely reported. Infertility is defined as Inability to conceive even after one or more year of unprotected regular sexual intercourse¹. According to a population study, incidence of contribution of male factor alone is 26.2-46.6% and again 50% infertility problems are reported only due to reduced number of sperm i.e oligozoospermia². Ksheena Shukra Dusthi is qualitative and quantitative Reduction of shukra dhatu due to vitiation of Vata and Pitta Dosha³. Oligozoospermia is reduced sperm count less than 15 million sperm / ml semen or 39 million/ ejaculation⁴.

In Ayurvedic classics, herbal and herbo-mineral fertility agents are explained in details. To prove the action of a drug, a clinical trial on human being is very necessary. Now, in this scientific era, any drug cannot be accepted without a scientific clinical trial. So, clinical trial is very important part of a study. Here the present study is entitled as “An Open Labelled Comparative Rct Study To Assess the efficacy of Uttara Basti followed by Kushta Amalaki Swarnavanga Yoga and Kokilaksha Beeja Vrushya Rasayana Yoga in Ksheena Shukra dushti(Oligozoospermia)”. In this study trial 40 patients were administered with intervention after assessing inclusion and exclusion criteria. The pre- and post-semen analysis during the treatment period shows a marked increase in sperm count. The outcome of this clinical trail study reveals that Ayurvedic treatments can effectively manage the oligozoospermia associated with male infertility.w.r.t Ksheena shukra dushti.

KEY WORDS: Male infertility, Oligozoospermia, Ksheena shukra dushti, Uttarabasti, Kushta amalaki swarnavanga vrushya yoga, Kokilaksha beeja vrushya yoga.

Introduction

Ayurveda being a complete medical science is propagated with eight branches, the specialities begin with kayachikitsa and ends with vajikarana chikitsa. Vajikarana chikitsa has been given special importance for men sexual health. A couple may be considered as infertile if not conceived even after one or more year of regular sexual intercourse without any contraception. Incidence of global infertility is around 16.7%, male factor alone contributes around 26.2-46.6% and again 50% infertility problems are reported only due to inability to produce adequate number of sperm i.e oligozoospermia. Incidence of the issue expands day by day because of the disturbing lifestyle, occupational factors, economic causes etc.

Oligozoospermia is a decrease in the sperm count below 15 million sperm per ml. Oligozoospermia is one of the major cause for male infertility. In ayurveda it can be correlate with ksheena shukra dusthi. Ksheena shukra is qualitative and quantitative reduction of shukra dhatu caused by vitiation of vata and pitta dosha. Mainly apana vata and vyana vata, Chala guna of vata, Sara guna of pitta vitiation leads to reduced sperm leading to Oligozoospermia. This vitiation of doshas are due to indulging in Aharaja hetus like excessive consumption of Katu rasa, Kashaya rasa, lavana rasa, Rooksha ahara, Teekshna ahara for longer duration. viharaja nidana like Excessive sexual intercourse, Excessive physical exercise, Masturbation, Alcohol, smoking, tabacoo, Stress, environmental factors, Manasika hetus like chinta, bhaya, krodha for longer duration leads to Rasadi dhatu depletion resulting in shukra dhatu kshaya.

There is no satisfactory treatment in modern medicine for these conditions as it is based on Hormonal therapy. This Hormonal therapy has got its own side effects and limitations. the cost of treatment is very expensive and common man cannot afford. So Ayurveda is the better option for these conditions as it treats and check the root cause of the disease and minimize the recurrence of the same. Deepana Pachana is adya upakrama in managing any disorder. Correcting Agni and Ama following other treatment promotes better results. Basti Karma is considered as the best treatment in Shukra Dosha by Charaka's statement "Prashashtha-Shukradosheshu Basti Karma Visheshatha"⁵ and Niruha basti is considered to be Shukra bala prada⁶. Uttara Basti is indicated in shukra dusthi and it performs all sorts of actions like Shodhana (Shukra shodhana), Samana and Bramhana Hence, the medicines administered through urethral route helps in normal functioning of Apana Vata. Hence In the present study Deepana Pachana, Niruha basti, uttar basti and vrushya Rasayana yoga is selected to improve Semen parameters in oligozoospermia-ksheena shukra dusthi.

Vajikarana has been described specially to improve the male sexual reproductive health and enhance the status of Sukra even at old age. Hence, research work has been undertaken entitled with "An open labelled comprative RCT study to evaluate the efficacy of uttarabasti followed by kushtaamalaki swarnavanga yoga and kokilaksha beeja vrushya rasayana yoga in ksheena shukra dushti(oligozoospermia)" Subjects were randomly selected and registered made into 2 groups consisting of 20 subjects in each group A and group B from Taranath Government Ayurvedic Medical Hospital Bellary.

AIM

Assess the Efficacy of utara basti followed by kushta amalaki Swarnavanga yoga and kokilaksha beeja vrushya rasayana yoga in ksheena shukra (oligozoospermia).

Objectives of the study

1. To review critically on aetiopathogenesis, Roga rogi pareeksha , Diagnosis of Ksheena Shukra (Oligozoospermia) as per Ayurveda and Modern literature.
2. To evaluate the combined efficacy of kushtaamalaki ksheera kashayabasti, kushtaamalaki taila uttarabasti, Kushtaamalaki swarnavanga vrushya rasayana yoga in Ksheena shukra (oligozoospermia).
3. To evaluate the combined efficacy of kokilaksha beeja ksheera kashaya basti, kokilaksha beeja taila uttarabasti, kokilaksha beeja vrushya rasayana yoga in Ksheena shukra (oligozoospermia).
4. To compare the combined efficacy of kushtaamalaki ksheera kashaya basti, kushtaamalaki taila uttarabasti ,kushtaamalaki swarnavanga vrushya rasayana yoga and kokilaksha beeja ksheera kashaya basti, kokilaksha beeja taila uttarabasti, kokilaksha beeja vrushya rasayana yoga in Ksheena shukra (oligozoospermia).

MATERIALS AND METHODS

Literary source:-A complete review of all available literatures including classical texts, articles and reputed journals was done concerned with the disease Ksheena Shukra (Oligozoospermia) and the trial drug kushta⁷ , amalaki⁸, swarnavanga⁹ and kokilaksha^{10,11,12}.

Source of cases :- 40 subjects were randomly selected and registered for the clinical trial from OPD, IPD of Taranath Government Ayurvedic Medical College, Hospital and Research Centre, Bellary. Subjects will also be selected from referral sources and special medical camps conducted for the purpose

CRITERIA FOR SELECTION OF CASES**Diagnostic criteria: -**

- Classical Lakshanas of Ksheena Shukra¹³ - Dourbalya, mukhashosha, panduta, sadana , srama.
- Computer assisted semen analysis(CASA) parameters showing features Oligozoospermia, Sperm count < 15million/ml .

Inclusion criteria

1. Male subjects of age between 20 - 50 years.
2. Diagnosed cases of Oligozoospermia as per CASA (Sperm count < 15 million/ml)
3. Subjects who will give informed consent.
4. Subjects fit for basti karma and Uttara basti.

Exclusion criteria

1. Congenital disorders related with reproductive system like bilateral absence of the vas- deferens, cryptorchidism, Klinefelter's syndrome.

2. Subjects unfit for Niruha basti and Uttara basti.

Withdrawal criteria

Patient can get withdraw from the trial anytime with following reasons

- Case may be having any health and safety issues, Personal reasons, Non-compliance,
- Lost to follow up, Randomization error.

Assessment criteria:

Subjective parameters

- ◆ Ksheena Shukra parameters like Daurbalya, Mukhashosha, panduta, sadana, srama will be assessed.
- ◆ Sexual parameter like Sexual desire, erection, ejaculation, orgasm will be graded and scores will be given accordingly.

Objective parameters

- CASA based seminal parameters- sperm count/ml.
- Hormonal parameters
 - Sr TESTOSTERON (FREE AND TOTAL)
 - Sr FSH

INTERVENTION

GROUP A-20 PATIENTS

1. DEEPANA PACHANA with Amalakyadi gana kashaya 20ml Thrice a day before food with sukhoshna jala for 5 days or till amapachana and deepana.
2. KOSHTA SHODANA with Eranda taila 40ml or as per koshta early morning in empty stomach with sukhoshna jala for 1 day.
3. AYUGMA KSHEERA KASHAYA BASTI- kushta amalaki ksheera kashaya basti 400ml early morning in empty stomach for 3 consecutive days
4. UTTARA BASTI – Kushta amalaki taila 40ml afternoon for 3days
5. VAJIKARANA YOGA- Kushta Amalaki Swarnavanga yoga 500mg 2 capsules twice a day Before food for 21days with sukoshna jala as anupana.

GROUP B- 20 PATIENTS

1. DEEPANA PACHANA with Amalakyadi gana kashaya 20ml Thrice a day before food with sukhoshna jala for 5 days or till amapachana and deepana.
2. KOSHTA SHODANA with Eranda taila 40ml or as per koshta early morning in empty stomach with sukhoshna jala for 1 day .

3. AYUGMA KSHEERA KASHYA BASTI - kokilakshya ksheera kashaya basti 400ml early morning in empty stomach for 3 consecutive days
4. UTTARA BASTI – Kokilaksha beeja taila 40ml afternoon for 3 days
5. VAJIKARANA YOGA- Kokilaksha beeja yoga 500mg 2 capsules twice a day before food for 21 days with sukoshna jala as anupana.

OBSERVATIONS AND RESULTS

TOTAL NUMBER OF SUBJECTS: Out of 40 Subjects, Group A 20 subjects and Group B 22 subjects. and in group B out of 22 subjects 2 subjects left the treatment during the clinical study.

DISTRIBUTION OF 40 SUBJECTS BASED ON AGE:

It is observed in the clinical trial of Group A, the number of subjects was from the age group of 20 – 25 years is 0, 26-30 years are 4, i.e.,20% and maximum number of subjects between 31– 35 age group are 8 i.e., 40% , 36-40 age group are 6 i.e 30%, 41-45 age group are 1 i.e 5% and 46-50 age group is 01 i.e 05% of the total subjects. Group B numbers of subjects were from the age group of 20– 25 years are 03 i.e., 15%, 26-30 years are 6 i.e., 30% and maximum number of subjects between 31– 35 age group are 7, i.e.,35%, 36-40 age group are 2 i.e 10%, 41-45 age group are 1 i.e 5%, 46- 50 age group are 01 i.e 5% of the total subjects.

DISTRIBUTION OF 40 SUBJECTS BASED ON MARITAL STATUS:

It is observed during the clinical study that Marital status of Group A had 20 (100%) subjects were married and 00 (00%) are unmarried. In Group B , 19 (98%) subjects were married and 01 (02%) unmarried.

DISTRIBUTION OF 40 SUBJECTS BASED ON ECONOMICAL STATUS:

During the clinical study it is observed that in group A 3 (15%) subjects are upper middle class, 2(10%) are Middle class, 11(55%) subjects are lower middle class and 4(20%) subjects are poor. In group B 5 (25%) subjects are upper middle class, 3(15%) are Middle class ,11(55%) subjects are lower middle class and 01(5%) subjects are poor.

DISTRIBUTION OF 40 SUBJECTS BASED ON ADDICTIONS(VYASANA):

It is observed during the clinical study that in Group A, 4(20%) subjects were alcoholic, 1(5%) subjects were alcoholic and smoking, 1(5%) subjects were alcoholic and tobacco, 2(10%) subjects were tobacco, 12(60%) subjects were having no habits. In Group B, 3(15%) subjects were alcoholic, 3(15%) subjects were alcoholic and smoking, 1(5%) subjects were alcoholic and tobacco, 2(10%) subjects were tobacco, 11(55%) subjects were having no habits.

DISTRIBUTION OF 40 SUBJECTS BASED ON PRAKRUTI:

During the clinical study It is observed that in Group A, 4 (20%) subjects were Vata-pitta prakruti, 15(75%) subjects were Vata-Kapha prakruti, and 1 (5%) subjects were pittakapha prakruti. In Group B, 3 (15%) subjects were Vata-pitta prakruti, 13(65%) subjects were Vata-Kapha prakruti and 4 (20%) subjects were pittakapha prakruti.

DISTRIBUTION OF 40 SUBJECTS BASED ON VAYA:

During the clinical study It is observed tha in Group A, 0 (0%) subjects were Balya, and 20 (100%) subjects were Madhyam vaya. In Group B, 0 (0%) subjects were Balya, and 20 (100%) subjects were Madhyama vaya.

DISTRIBUTION OF 40 SUBJECTS BASED ON H/O MASTURBATION:

It is observed during the clinical study that in Group A, 5 (25%) subjects had a history of masturbation and 15 (75%) subjects were not having a history of masturbation. In Group B, 7(65%) subjects had a history of masturbation and 13 (35%) subjects were not having a history of masturbation.

DISTRIBUTION OF 40 SUBJECTS BASED ON KSHEENA SHUKRA LAKSHANA:

It is observed during the clinical study that Ksheena shukra Lakshana of subjects in Group A, 18(90%) subjects were had dourbalya, 13(65%) subjects were had mukhashosha, 4(20%) subjects were had panduta, 3(15%) subjects were had sadana, 6(30%) subjects were had shrama. In Group B , 17 (85%) subjects were had dourbalya, 13(65%) subjects were had mukhashosha, 2(10%) subjects were had panduta, 6(30%) subjects were had sadana, 9(45%) subjects were had shrama.

DISTRIBUTION OF 40 SUBJECTS BASED ON SEXUAL PARAMETERS:

During the clinical study it is observed that sexual parameters in subjects in Group A, 6(30%) subjects were having problem with sexual desire, 4(20%) subjects were having problem with ejaculation, 7(35%) subjects were having problem with penile erection, 8(40%) subjects were having problem with orgasm. in Group B, 6(30%) subjects were having problem with sexual desire, 5(25%) subjects were having problem with ejaculation, 10(50%) subjects were having problem with penile erection, 9(45%) subjects were having problem with orgasm.

DISTRIBUTION OF 40 SUBJECTS BASED ON SPERM COUNT:

During Clinical study Sperm count during semen Analysis It is observed that In Group A, Subjects who had <5 million were 12 (60%), 5-10 million were 6(30%), 11-15 million were 2(10%), > 15 million were 0(0%) and In Group B Subjects who had <5 million were 10 (50%), 5-10 million were 5(25%), 11-15 million were 4(20%), > 15 million were 1(5%).

DISTRIBUTION OF 40 SUBJECTS BASED ON HORMONES FINDINGS:

It is observed during the clinical study, findings on Hormonal analysis. In group A, 3 (15%) subject had a raised FSH, 3(15%) subject had low Testosterone, 14(70%) subjects had normal. In group B 3 (15%) subject has had a low Testosterone, 1(5%) subject had low FSH and 16(80%) subjects had normal.

Results

Descriptive data included mean, standard deviation (SD), interpretation of “t” value and P value were calculated for the variables in trial group by using Friedman -test for subjective and objective parameters within group and mann whitney test for subjective parameter, independent sample t test for objective parameter between the groups used . That included standard deviation, Z value interpretation, the corresponding P value was noted and the obtained results were interpreted.

OVERALL ASSESSMENT BETWEEN THE GROUPS

TABLE NO.01 SHOWING OVERALL ASSESSEMENT BETWEEN THE GROUPS

	Parameters	P value	
		Group A	Group B
	<i>Shukra kshaya lakshana</i>		
Subjective Parameter	Dourbalya	<0.001	<0.001
	Mukhashosha	<0.001	<0.001
	paanduta	0.004	<0.001
	Sadana	0.002	<0.001
	Srama	<0.001	0.003
	Sexual Parameters		
	Sexual desire	0.01	<0.001
	Ejaculation	<0.001	0.009
	Penile erection	<0.001	<0.001
	Orgasam	<0.001	<0.001
Objective parameters	Sperm count	<0.001	<0.001
	Sr Testosterone	<0.001	<0.001
	Sr FSH	<0.001	<0.001

DISCUSSION ON RESULTS

EFFECT OF INTERVENTION ON SUBJECTIVE PARAMETERS

Dourbalya: In this study 18 subjects had dourbalya but after started intake of vrushya rasayana they observed difference in their routine activities. it is noticed that activeness and working hours without rest is improved, Dourbalyata immediately after 1 or 2 sexual act which is observed before treatment also got improved. so the patients were having daurbalya is not so severe i.e the daurbalya which is by Shukra dusthi is not so severe that it disturb there routine work but the degree of performance make difference after the vrushya Rasayana yoga. Dourbalya was reduced with intervention in group A by p value <0.001 and 78% improvement .in Group B Dourbalya was reduced with p-value <0.001 and 72 % improvement. On comparing Both groups showed statistically highly significant result However Group A showed better Results percentage wise.

This may be due to Administration of Balya, brimhana, vrushya and Rasayana upakrama. Amalakyadi gana kashaya and kushta amalaki ksheera kashaya basti which does the sroto mukha shodhana, and Brihmana, uttar basti which removes the avrana and Amalaki is rich in Vitamin C provides good nourishment to body, having properties of vayasthapana, tridosha hara and rasayana helps in improving bala in this condition.

Mukhashosha: Dryness of the mouth during sexual intercourse, after the act or regularly in routine life due to the *Kaphakshaya* and *Rasakshaya*. Modern science also accepts that dryness of mouth occurs due to psycho-biological stress and strainful conditions and in anxiety. *Ksheena Shukra* is due to increased *Vata* and *Pitta* and *Rasakshaya*. In this clinical trial 60% of cases were presented with *Mukhashosha*. Reduced with intervention in Group A by p-value <0.001 with 68% improvement, in Group B reduced by p-value <0.001 with 77% improvement. On comparing Both groups showed statistically highly significant result, However Group B showed better Results percentage wise.

This may be due to Application of Vata and pittahara chikitsa. Amalakyadi gana Kashaya contains Vata hara and pitta hara drugs which helps to reduce rukshata, niruha basti contains pitta and vata hara ksheera kashaya, kokilaksha beeja taila uttar basti does srotoshodhana and enhances the snigdhatva to all over the Body and kokilaksha beeja churna vrushya rasyana acts as vata pittahara having Madhura rasa, sheeta veerya, Madhura vipaka, Tridosha shamaka helps in curing Mukhashosha.

Panduta: In this clinical trial 20% of cases were presented with Panduta but after they started with Amalakyadi gana Kashaya, Uttaravasti and rasayana they observed difference in their condition. Paanduta was reduced with intervention in group A by pvalue 0.004 with 75% improvement. in group B by p-value <0.001 with 82% improvement. On comparing both groups Group B showed statistically highly significant result.

Improvement may be due to Rasayana action of Amalaki in Amalakyadi gana Kashaya and vrushya yoga. Amalaki is Yakrut utejaka, as Yakrit is mula sthana of rakta and it contains Folic acid, Vit-c having anti

oxidant and free radical scavenging activity, acts on rasa and rakta dhatu there by improving panduta in this clinical trail.

Sadana: Sadana means lack of enthusiasm or interest. It also refers to debility. Sadana, in case of Ksheena Shukra, refers to decrease in libido or reduced sexual activities which may be due to Shukra kshaya and Rasa Kshaya and increased Vata and Pitta dosha. In this clinical trial 15% of cases were presented with Anga sadana. symptom reduced with intervention in group A by p-value 0.002 with 67% improvement, in group B by p-value a <0.001 with 76% improvement. On comparing both groups Group B showed statistically highly significant result.

This may be due to Amalakyadi Gana Kashaya, kokilaksha beeja Ksheera kashaya basti, UttaraBasti and kokilaksha beeja vrushya rasayana. As all these measures having brimhana, Balya, Vrushya, Rasayana acts on tridoshas and helps in improving sarvadaihika lakshanas of ksheena shukra.

Srama: Feeling of Generalized weakness, a feeling of discomfort; a feeling like having illness due to the Vata Prakopa and Kapha Kshaya. Shrama in context of Ksheena Shukra indicates both physical and psychological exertion and fatigue. The capacity to work or the Dehabala is assessed by the Vyayama Shakti while the sustaining capacity of Mano bhavas is assessed by Satwa bala. Shrama reduced with intervention in group A by p-value <0.001, in group B by p-value 0.003. on comparing both groups Group B showed statistically highly significant result.

This may be due to Amalakyadi Gana Kashaya, Uttarabasti and Rasayana as drugs used in these measures are having the properties of balancing Tridosha and acts as balya. Hence improving Shrama in case of ksheena shukra.

Sexual Desire: Sexual desire is an emotion and motivational state characterized by an interest in sexual activities. Due to *chinta, shoka, bhaya*, leads to vitiation of *sharirika* and *manasika dosha* i.e *vata, tamo* and *rajo dosha* and *shukra dhatu*. Also, Reduced testosterone hormone which leads to lack of sexual desire. There is increased sexual desire with intervention in group A by p-value 0.01, in group B by p-value <0.001. on comparing both groups, Group B showed statistically highly significant result.

This may be due to Amalakyadi Gana Kashaya is a positive neuroprotective function and increase the glutathione levels of the brain, increases sexual desire. By Basti stimulates the neurotransmitter such are serotonin, dopamine, glutamate, norepinephrine and nitric oxide and *kokilaksha beeja Rasayana* as *Vrushya* Upregulates the anterior pituitary gland to secrete FSH and LH causing increased synthesis of testosterone by the Leydig cells of the testis. Increased level of dopamine in the brain increases sexual desire.

Erection : Erection is a hardening of the penis that occurs when cavernosal tissue filled with blood. Is triggered by stimulation of nitric oxide to rise in the trabecular arteries and smooth muscle. Due to *vataprapakopa nidanas* and *manasika nidanas*, leads *Tridosha vridhhi*, shukra kshaya which cause the *avarana*

of the *dhamanis* which in turn lead to reduced penile erection. Erection improved with intervention in group A by p-value <0.001 with 65% improvement, in Group B by p-value <0.001 with 85% improvement. On comparing, Both groups showed statistically highly significant result, However Group B showed better Results percentage wise.

This is By *Basti* and *uttarabasti* the urothelium and endothelium will be exhibiting the signals and activation of the hypothalamic-pituitary-adrenal axis. Cholinergic effect on the endothelial cells results in the production of endothelium-derived relaxing factor to cause relaxation of the smooth muscle lining of the sinusoidal spaces through nitric oxide simultaneously vasodilates arterioles and increases penile blood flow. *Amalakydi gana kashaya and kushta amalaki swarnavanga yoga, Kokilaksha beeja vrushya yoga* Provides good sources of energy by virtue of its chemical constituents and provides strength to penis.

Ejaculation : Ejaculation is a complex and coordinated neuromuscular mechanism to deliver the semen. Ejaculatory reflex is initiated and coordinated by cerebral integration of visual, auditory, tactile and olfactory stimuli. Due to *chinta, shoka, bhaya*, and *kroda*, vitiation of *Sharirika* and *manasika* dosha that is *Prana, vyana, apanavata, tamo* and *rajo* dosha and *shukra dhatu*. Improved with intervention in group A by p-value <0.001, in group B by p-value 0.009. On comparing both groups, Group A showed statistically highly significant result.

May be due to *Kushta amalaki swarnavanga Rasyana* helps in cleansing the *srotas* for proper movement of *vata* act as *Shukra pravartaka*, *balya* and *vrushya* helps in removing the free radicals present in the microcirculatory channels of *shukravaha srotas* which interferes with the function of *shukra* and by doing so improves ejaculation. The given *basti* will reach first into the organ *basti* direct relation with *Mushka, shukra* and *mutravaha nadi* and correct the *apana vata*. *Uttarabasti* gaining direct access to *moola sthana of shukravaha srotas* and *basti* the seat of *apana vata*. As the *Apana Vata* is vitiated in *Ksheena Shukra*, there may be deranged ejaculation. As the trial drug contains potent *Vata Shamaka Dravyas*, which may lead to the proper functioning of *Apana Vata*, the ejaculation becomes proper. By this way the premature and the late ejaculation might have rectified.

Orgasm : Orgasm is excitement or sexual climax, is the sudden discharge of accumulated sexual excitement during the sexual response cycle, resulting in rhythmic, involuntary muscular contractions in the pelvic region characterized by sexual pleasure. Which was improved with intervention in group A by p-value <0.001 with 74% improvement, in Group B by p-value <0.001 with 85% improvement. On comparing, Both groups showed statistically highly significant result, However Group B showed better Results percentage wise.

This may be due to *Vrushya, Brimhana, jeevana, rasayana, mana prasadena* effect of *Amalakydi gana kashaya, Ksheera kashaya basti, Uttarabasti* and *kokilaksha beeja vrushya yoga*.

Sperm Count : Sperm count less than 15 million/ml and 39 million/ejaculate is considered as Oligozoospermia. sperm count improved in group A by p-value <0.001 with 78.5%, in Group B p-value <0.001 with 71% improvement. On comparing, Both groups showed statistically highly significant result, However Group A showed better Results percentage wise.

This may be due to *Amalakyadi gana Kashaya* contains Chitraka, pippali, haritaki and amalaki having katu tikta kashaya rasa, laghu ushna guna, katu and madhura vipaka, ushna veerya act as amapachaka and deepana. and all 4 drugs have vatanulomana, vrushya, rasayana and shukra shodana karma which increase the *shukra dhatu* by pacifying the *vata dosha*. *Ksheera kashaya Basti* which is directly acts on majja and shukravaha srotas, increases shukra by brihmana, vrushya and vatanulomana action. *Uttarabasti* stimulates the epithelium of the scrotum, urethra, bladder, prostate, Seminal vesicles, and testis which helps in spermatogenesis. The free radical scavenging of *Kushta amalaki taila* acts as anti oxidant and facilitate spermatogenesis there by increasing sperm count. In *Kushta amalaki swarnavanga yoga* all the 3 drugs having vrushya, rasayana, shukra shodana and shukrala effect and testicular regeneration action of swarnavanga helps in spermatogenesis and increases the sperm count.

Serum Testosterone: Testosterone is secreted in the testes. Responsible for the formation of penis, scrotum, spermatogenesis and development of the secondary sexual characteristics. Testosterone plays a major role for increasing sexual desire, erection by stimulating the neurotransmitter that is nitric oxide. Increased Sr testosterone level in Group A by p value <0.001 with 20.5% improvement, in Group B by p value <0.001 with 24% improvement. On comparing, Both groups showed statistically highly significant result, However Group B showed better Results percentage wise.

May be due to Polyphenols of *Amalakyadi gana kashaya* shown a positive neuroprotective function and increase the glutathione levels of the brain, thus relieving oxidative stress and maintaining an endogenous hormone level, increase testosterone level. The *Ksheera kashaya basti* and *Kokilaksha beeja taila Uttara basti* having compounds like lactones, costunolide, β -sitosterol, and glycosides which intact with androgen hormones and increases the Sr testosterone level.

PROBABLE MODE OF ACTION OF INTERVENTION

Amalakyadi Gana Kashaya¹⁴

In shukra dushti, Deepana pachana is adya upakrama, after the management of agni and ama. It makes easier for the action of other medicines to acts upon target cells and produce the outcome efficiently. so here Amalakyadi gana Kashaya which aims at agni Deepana, mala pachana is selected to enhance the agni at dhatu level and act upon shukravaha srotas. Amalakyadi gana Kashaya possess key ingredients that promotes agni, tackles ama and avarana, it also constitutes vrushya drug like Amalaki which helps in improving semen parameters too. Amalakyadi Gana Kashaya constituents, Amalaki is the richest source of ascorbic acid and is needed for the smooth functioning of glutathione. An increase in the concentration of vitamin C increases the concentration of glutathione and increases the cellular ameliorates apoptosis helps in improving ksheena

shukra. Chitrakamoola as it is well known for Agni Deepana it also does Ama pachana due to Katu rasa, katu vipaka and ushna veerya. Haritaki has been found to be effective in elimination of doshas and corrects the derangement of apana vayu. Pippali churna as vatakaphahara, Dipana, vrushya and sroto shodhaka. Overall Amalakyadi gana Kashaya with effective ingredients has provided additional benefits in improving jataragni, dhatvagni and the Status of ksheena shukra in this clinical trial.

Koshtha shodhana with Eranda taila¹⁵

Acharya Charaka very clearly opines importance of shodhana before administration of vajikarana chikitsa, keeping the same in mind Koshtha shodhana with Eranda taila is planned in this clinical trial. In case of ksheena shukra dushti there is vitiation of vata and pitta causing defects in semen, virechana which is vatapitta doshahara helps in removing vitiated pitta and vata facilitating production of pure shukra. Eranda taila most preferable koshta shodana dravya in case of ksheena shukra because of madhura rasa, tikshna ushna sukshma guna, madhura vipaka, sroto vishodana, vrushya, vaya sthapana, shukrashodana, smriti balakara, adhbhaga dosha hara properties(su su 45/114). Acharya Kashyapa very precisely states that the effect of Virechana enhances the structural and functional capabilities of reproductive gametes. Shukra is Saumya i.e Jala mahabhuta pradhana, in the pathogenesis of ksheena shukra there is a involvement of pitta and vata. Pitta is agneya mahabhuta pradhana, so in order to increase the soumyata one has to decrease the agni tatva which can be achieved through hrasahetu vishesha principle. In order to remove the vitiated pitta dosha virechana is administered. Active principles of virechana Dravya are soma and Prithvi predominant which alleviates srotorodha and active transformation of dhatu through dhatavagni vyapara. Virechana is responsible for rectifying the Pittadhara Kala, as it is the main procedure for Pitta Shodhana. According to Acharya Dalhana, Pittadhara Kala and Majja Dhara Kala are considered to be same. Hence Majja dhara Kala may also be rectified through Virechana, which will lead to the formation of pure Majja and hence most desirable shuddha shukra is procured.

Mechanism of action of Niruha Basti:

Basti is obvious line of management as per charaka statement Prashastha Shukradosheshu Bastikarma Visheshata. Vata is a very important dosha to be managed during the treatment of ksheena shukra. In this clinical trial, focusing on sperm count vata is a responsible factors. Basti is the prime therapy in the management of vata dosha, and is called ardha chikitsa mentioned in charaka siddhithana. Poorna chikitsa in sushruta chikitsa sthana mentioned not only in vata dosha, but pittaja, kaphaja, raktaja, sannipatika conditions can be benefited by basti, so in case of Oligozoospermia, along with vata there is also involvement of pitta (sara guna in motility) so basti plays an important role. Basti has the potential to excrete morbid dosha from all the parts of the body even though it is pakvashayastha. The organs which are close relation to basti are guda, nabhi, kati, parshwa, kukshi. The given basti will reach first into the organ basti direct relation with Mushka, seevani, sthula guda, shukra and mutravaha nadi. Basti also activates CNS by stimulating neurotransmitters like serotonin, dopamine, glutamate, norepinephrine and nitric oxide, Stimulation of these precipitates result efficiently. The sigmoidal, rectal, anal regions of large intestine are

considerably better supplied with parasympathetic fibres than other part of intestine. They are mainly stimulatory in action and function especially in defecation reflexes. Even though the basti given is expelled out immediately, the veerya of basti is spread throughout the body by the vata. From this we can understand that action of basti is possible through nervous stimulation. In this clinical trial, Ksheera kashaya basti was planned. Basti dravya used in the present study are Kushta amalaki kalka in group A and kokilaksha beeja kalka in group B. Ksheera kashaya basti is directly indicated in asthi majja and shukravaha sroto vikara. it act as both dosha shamana and bhrimana , vatanulomana which is the required action in ksheena shukra. it is mentioned in the Ashtanga hrudaya utara tantra that before Uttara basti 2-3 niruha basti should be administered in order to evacuate the vitiated doshash from the pakwashaya (apana vata) and to improve the absorption of sneha dravaya. Having the properties of Basti vishodhana, shukrala, Tridosha shamaka and Vrushya. Hence this procedure helps in improving semen parameters.

Mechanism of action of Uttarabasti:

Uttarabasti is transurogenital intra vesicular drug delivery system in male, medicine administered into the bladder through the phallus last beyond the first voiding of the urine after installation. Uttara Basti performs all sorts of actions like Shodhana (Shukra shodhana), Shamana and Bramhana. In samitha's the indication of uttarabasti beings with shukra dushti which indicates the importance of application of uttarabasti in managing ksheena shukra dushti. Uttarabasti is administered through shukravaha srotomoola i.e medra, thus it helps in rectifying shukravaha srotas abnormalities there by promoting spermatogenic action. The permeability of the transitional epithelium of the bladder also known as urothelium. When the medicine is administered, the only mode of membrane transport across urothelium is passive diffusion. The drug transport across the urothelium may be improved due to the high gradient concentration. The urothelium and endothelium will be exhibiting the signals and activation of the hypothalamic-pituitary adrenal axis. In ksheena Shukra dushti main principle of management should be to restore the normal functioning of apana vata as it is responsible for shukra nishkramana kriya. Varicocele in the testis, epididymal cyst, Atherosclerosis and Venocclusive in penis can be taken as srotomarga nirodhana. Apana dushti in its own sthana needs a strong treatment to cure it. Uttarabasti gaining direct access to basti the seat of apana vata and by purgative action of Uttara Basti in the urinary bladder the process of sexual functions will be re-established. Hence it is indicated in management of ksheena shukra dushti, as it alleviates the sanga, atipravritti of vata and cleansing the srotas for proper movement of vata. In this clinical trial, Uttarabasti with Kushta amalaki taila in Group A improves semen parameters as it mainly contains Kushtha Churna which is Tikta katu Madhura Rasa, ushna veerya having the properties of Shukra Shodhana, Shukrala. Amalaki is Vrushya, tridosahara. The chemical constituents being arginine, ascorbic acid, ellegic acid, astragaline etc known to be stimulating spermatogenesis in testis through various metabolic pathways. The combination of Kushtaamalaki, acts as antioxidant with free radical scavenging ability to improve spermatogenesis. Kokilaksha beeja taila in Group B, kokilaksha beeja is madhura rasa, madhura vipaka, sheeta virya having shukra shodana and shukra janaka properties. During preparation of kokilaksha beeja taila it is observed that there is increased PH of taila from 7.2 to 7.9. and thready formation of kalka dravya. By interpreting the

changes observed during preparation we can come to conclusion that, this taila helps to increase PH and viscosity of semen along with spermatogenic effect. A small fraction of orally administered drugs only acts on the desired site either due to poor absorption or due to metabolic loss for which systemic therapy in sexual dysfunction is often not fruitful. This loss can be avoided from first-pass metabolism, thus the therapeutic effect of a drug at the target site can be achieved by administering Uttarabasti. The need for a prolonged regimen of oral administration for achieving efficacy can be lowered by uttara basti.

Kushthamalaki swarnavanga vrushya rasayana yoga

Kushtha Churna is Tikta katu Madhura Rasa, ushna veerya having the properties of Shukra Shodhana, Shukrala, vrushya, rasayana and vatahara. To tackle Ksheena shukra, vatapitta hara upakrma followed by shukrala property is required. kinchith Madhura, Ushna, Vata pitta shamaka followed by the shukrala effect is expected in Kushta has it is tikta, Katu, ishad Madhura rasa having the Katu vipaka and Ushna virya. But by screening the Panchabautika of Dosha and Rasa it clears that by its Madhura Rasa helps to decrease Prakupita Vata dosha and by Prabhava we can expect the Shukrala property.

Amalaki is Vrushya, tridosahara. The chemical constituents being arginine, ascorbic acid, ellegic acid, astragaline etc known to be stimulating spermatogenesis in testis through various metabolic pathways. these also increases testicular weight, testis volume, spermatocyte, sertoli cells and leydig cells through enhanced gene expression of Bc12. As anxiety(bibitata) and stress is one of the cause for oligozoospermia which is caused due to manovaha sroto dushti. By madhura vipaka and sheeta virya , amalaki acts as mana prasadaka , balya and bruhmana. All the ingredients of swarnavanga carry the properties of Rasayana, Balya, Vrushya, Agnideepana. the parada having yogavahi guna might act as catalyst and help in reaching the drug to target organ. Vanga is said to be Rasayana, Vajeekarana and Ojovruddhikara. It is said to have testicular regeneration property. Gandaka is a good rasayana having madhura rasa and madhura vipaka. Navasagara is having madhura vipaka and deepana pachana property. Thus swarnavanga having sheeta guna and madhura vipaka targets its action on shukra dhatu. Hence the combined effect of Kushta, Amalaki and Swarnavanga definitely concentrates on shukra dhatu and thus Oligozoospermia.

Kokilaksha beeja vrushya rasayana yoga

Kokilaksha beeja is having madhura rasa , madhura vipaka, sheeta virya, shukra shodana , shukra janaka, Guru & Picchila Guna which are Brimhan, Sarva Dhatu Vardhak in nature, so by anabolic action they nourishes Oja and act as Shukra Dhatu Vardhak. And its Sheeta Veerya & Snigdha Guna are Saumya (Sheeta) in nature they help in maintaining consistency of semen by providing it with Snigdha, Bahalata , Saumyata, Guruta which are Shudda Shukra Lakshana. Hence by virtue of its guna karma kokilaksha beeja will help in shukra dhatu vriddhi and thus Oligozoospermia.

CONCLUSION

Application of *Kayachikitsa siddhantha* and following *Trividha chikitsa* yields fruitful results. In this clinical trial, principles of *kayachikitsa*, and *samhitha* based *chikitsa krama* was adopted. *Yukti vyapasraya chikitsa* was more focused, as and when required *daiva vyaparaya chikitsa* and *satvaajaya chikitsa* was also applied like worshipping god and counselling to the patients to *utra basti* procedures and positivity of ayurvedic intervention in *shukra dusthi*. Following pathya ahara and vihara during the treatment. All the treatment protocol planned was completely based on *samhithas*. *Ksheena shukra* is well matched with Oligozoospermia in modern science. As *ksheena shukra* is vitiated by *vata* and *pitta dosha*, *apana vata* and *vyana vata* vitiation leads to reduction in sperm cell concentration leading to Oligozoospermia. *Roopa dravya* is word used by *acharya charaka* which represent semen containing sperm as it is responsible for progeny. Hence in this study along with abnormal Semen parameters, *ksheena shukra lakshanas* are taken for observation before treatment and after treatment as evidence based research work.

The trail drug *Amalakyadi gana kashaya* for *Deepana pachana*, *Kosta shodhana*, *Kushta amalaki ksheera kashaya basti*, *Kushta amalaki taila uttarabasti*, *Kusthamalaki swarnavanga vrushya rasayana Yoga* was found to be more effective in management *ksheena shukra dusthi*-Oligozoospermia compared to *Kokilaksha beeja ksheera kashaya basti*, *kokilaksha beeja taila uttarabasti*, *Kokilaksha beeja vrushya rasayana Yoga*.

Hence, it can be said that *ksheena shukra*- Oligozoospermia manifested due to various casues can be effectively managed by *Deepana pachana*, *Kostha shodhana*, *Niruha basti* followed by *uttar basti* and *vrushya Rasayana yoga*.

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