

ASSESSMENT OF THE EFFICACY OF VIRECHANA KARMA IN THE MANAGEMENT OF KSHINA SHUKRA W.S.R. TO OLIGOZOOSPERMIA

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ABSTRACT

Despite great advances made by medical science in understanding each stage of the reproductive process, still infertility is a catastrophe and male is accountable in 26.2 - 46.6% of the cases of infertility. Oligozoospermia denotes less than 20 million spermatozoa per milliliter of ejaculation, and a prime cause responsible for male infertility. *Ayurveda* had realized these deformities, which lead towards *Klaibya* or *Vandhyatva*, and denote it as *Ashta Retodoshha*. Among these, the concept of *Kshina Shukra* may be correlated with oligozoospermia. *Shodhana* therapies hold a good possession in the treatment of *Shukradosha* and prescribed as best treatment regimen to confer the progeny and virility. *Virechana Karma* was selected to treat the condition as well as to appraise its role in this condition. *Apatyakara Ghrita* possesses *Vrushya*, *Shukrala* etc. properties, which again help to combat the condition. Hence, in this study in Group A, *Apatyakara Ghrita* was used for *Snehana* prior to *Virechana*, whereas in Group B it is used for *Shamana*. Both the group having 10 patients in each were treated for 45 days, statistically highly significant result was found. As per statistical evaluation, both groups were equally effective for the condition in present study.

Keywords: *Shukra*, *Kshina Shukra*, *Virechana*, Male Infertility, Oligozoospermia

INTRODUCTION

Birth and Death are two end of life, in between man has to pass a lot suffering and pain for survive and others. Some has to face an extra struggle i.e. struggle to reproduce or have an offspring, which is termed Infertility. In fact, there has been a drastic change in his day by day activities including Life style, Food habits, Sexual life, Environmental Pollution, Industrial and occupational hazards and due to all these factors, infertility is increasing day by day.

Ayurvedic treaties also states this worse condition in the words like, man without progeny is like a solitary tree¹. It

severely affects the couple's psychological harmony, sexual and social life. The couple desiring a child but unable to conceive feels demeaned, deprived and bitter. Generally, due to defect in spermatic function, male is unable to induce conception and he carries pathological semen reports include low sperm count. Oligozoospermia means less than 20 million spermatozoa per milliliter of semen²

Kshinashukra is denoted among eight type of *Shukra Dushti*, enumerated in *Ayurveda* classics. Acharya Sushruta clearly defines the condition of *Kshina Shukra* to be Vata – Pitta predominant³

and Upachaya is stated as treatment⁴ in this condition. Shodhana i.e. Panchkarma therapies have been kept in supreme veneration by the classical authorities of *Ayurveda* in ameliorating different varieties of *Shukradushti*⁵. By the use of these *Shodhana* therapies, one gets rid of diseases, as well as gains strength, plumpness, offsprings and virility⁶. To get enough virility or strength, before *Shodhana*, *Srotasa* should be clean to resort the aphrodisiac recepies. Acharya has explained the same phenomenon with the example of dirty cloth⁷.

Among these *Panchakarma*, *Virechana* mainly aims at eliminating the vitiated *Pitta Dosh*⁸. While describing the therapeutic measures for *Klaibya* in details, *Acharya Charaka* stated that after giving proper oleation and fomentation, patient should be given *Virechana* with *Sneha*⁹. *Acharya Kashyap* describes wonderful benefit of *Virechana Karma* and very presisely states that the effect of *Virechana* enhances the structural and functional capabilities of reproductive gametes¹⁰. Keeping all these points in mind, clinical trial were carried out in 20 patients divided into two groups, where *Apatyakara Ghrita* was used for *Snehana* prior to *Virechana* in Group A, and in Group B it is used as *Shamana*. *Apatyakara Ghrita*¹¹ contains *Shatavari*, *Vidari*, *Masha*, *Atmagupta* and *Gokshura*. All this drugs are having *Madhura Rasa*, *Guru – Snighda Guna* and *Madhura Vipaka*, which helps to increase the quality and quantity of *Shukra*. Keeping above mentioned views in mind the present work carried out with following

Aims & objectives:

- To evaluate the role of *Virechana* in the management of *Kshina Shukra*.

- To compare the efficacy of *Apatyakara Yoga* with or without *Virechana* in the management of *Kshina Shukra*.

Materials & Methods:

Clinical material comprised of the data and investigation carried out in 20 patients (10 patients in each) suffering from *Kshina Shukra* reported at OPD & IPD of S.M.B.T Ayurved College & Hospital, Dhamangaon.

Criteria For Selection of Patient:

Patients having classical signs and symptoms of *Kshina Shukra* was selected for the present study without any bar of cast & creed, religion, financial status etc by random sampaling, for further semenogram analysis.

Exclusion Criteria: Patients presented with organic defects, post surgical procedure or post trauma on the genital organs. The decrease of *Shukra* owing to long standing chronic disorders were also excluded from the study. Pateints having any history of Sexually Transmitted Disorders or any major metabolic ailment also were excluded.

Plan of Study: GROUP – A: *Pippali Churna* was given for 3-5 days, in dose of upto 10 gm in divided doses for *Dipana*. After that *Apatyakara Ghrita* was used for the purpose of *Abhyantara Snehana* according to *Agni*, *Koshtha* and *Bala* of the patient, in increasing order for 5 to 7 days. When *Samyak Snehana Lakshana* were obtained, a gap of 3 days was given and during this period *Sarvang Abhyanga* and *Swedana* was done. On the day of *Virechana*, *Virechana Kashaya*¹² with *Erand Taila* was administered according to *Koshtha* of the patient as *Virechana Aushadhi*. Patient was advised to take lukewarm water after administiring the *Virechaka Kashaya*. on the basis of

Shuddhi Lakshana, *Samsarjana Krama* was advised for next 3 to 7 days. Then, for remaining period (45 – days of *Virechana Karma*), patient was allotted *Apatyakara Ghrita* as *Shamana* therapy. Total duration of treatment in this group was 45 days.

Group – B:

In this group, patient was allotted *Apatyakara Ghrita* in dose of 20ml per day, with *Sharkara* and *Dugdha* for 45 days.

Criteria for Assessment:

Grade	Lakshana		
	<i>Maithune Ashakti</i>	<i>Medhra – Vrushana Vedana</i>	<i>Praseke Alpa Shukrata</i>
0	No problem in coitus	No pain	More than 3 ml.
1	Able to perform satisfactory coitus once in a day	Occasional pain during coitus	2 to 3 ml.
2	Able to perform satisfactory coitus after the interval of 2 and 6 days	Frequent pain during coitus	1 to 2 ml.
3	Able to perform satisfactory coitus after 2 weeks	Persistent pain during coitus	< 1 ml.
4	Not able to perform a satisfactory coitus	-	-

Semen Investigation:

Semen investigation was carried out with the following steps:

Volume	Total sperm count
Liquefaction	Motility
Viscosity	Total abnormal forms
pH	

Observations: The general observation made on 20 patients of *Kshina Shukra* (oligozoospermia) studied in this clinical trial showed that, 35% patients were from age group of 26-30 and 31-35 years, 75% belonged to Hindu community, 30% were educated up to level of higher secondary education, 35% were in service and maxi-

For assessing the patients, before and after the treatment, parameter used were,

A. Clinical assessment

B. Laboratory Investigation

A. Clinical Assessment: Improvement in signs and symptoms of *Kshina Shukra* and improvement in sexual health parameters (Mehra and Singh 1995) were recorded. A separate gradation scheme was used to evaluate the effect of therapy before and after treatment.

imum 50% belong to middle class. (Chart – I)

Addiction of tea was exhibited in maximum 60% of patients, 95% had shown negative family history, 55% were used hot water regularly for bathing and 45% patients were possessing *Vata-Pitta Prakrutti*. (Chart – II) Maximum 80% of patients having *Madhyama Sara*, 60% of *Madhyama Samhanana*, 65% of *Madhyama Satva*, 70% of *Madhyama Abhyavahara Shakti* and 50% of *Madhyama Jarana Shakti*. (Chart – III)

Most of the patient i.e. 65% had attain their puberty between the ages of 16-18 years, 30% had marriage in between

24-28 years of age. 85% patients were found with the history of masturbation while 45% had positive history of Night emission and 5% patients had unsatisfactory sexual life (Chart – IV)

Maximum 85% of patients reported with primary infertility and 45% had complaint of Premature Ejaculation while 40% had erectile dysfunction. (Chart – V)

80% were found doing *Atisevana* of *Amla-Katu Vipaki Dravya*, Half of the patient (50%) had given history of *Vegadharana* and 65% gave history of *Chinta*, these are found as main *Nidana* in this study. (Chart – VII)

80% were having *Maithune Ashakti*, 75% patients were having *Daurbalya*, 70% had *Alpa Shukra Pravrutti*, followed by 55% patients were having *Panduta*, *Shrama*, and *Alpachesta*; whereas 50% patients were having complaint of *Klaibya* and 45% patients reported *Bhrama*. (Table – 1)

During the process of *Virechana*, 70% had started with 40-50 ml of *Sneha* dose on the first day while 60% had 175-225 ml of *Sneha* dose on the last day and 40% had consumed 800-950 ml of total *Sneha* during *Snehapana*. Most of the patient i.e. 70% got *Samyaka Snigdha Lakshana* on 7th day and in 40% of cases 200-250 ml of *Virechana Aushadhi* was given. First *Vega* was initiated in 60-80 min. in 50% of cases while in 40% of patient whole process completed in 8-11 hrs. 70% of the patient got *Madhyam Shuddhi Lakshana* on observation. (Chart – VI)

Effect of Therapy: In Group – A (*Virechana* Group) 87.34% improvement was noted in Sperm count, 71.11% in sperm motility, 35.2% in volume of semen and viscosity of semen increased by 33.33%. *Virechana Purvaka Shamana* significantly

increased sexual desire by 41.67%, erectile function by 37.5%, erectile rigidity by 66.67%, ejaculatory function by 39.13%, orgasmic function by 47.37%, *Maithune Ashakti* by 52.38%, *Medhra Vrushana Vedana* by 66.67%, and *Alpashukrata* by 71.42%. (Table – 2,4,6)

In this group 40% attain complete remission, 20% had marked improvement and remain 40% moderately improved. (Chart – VIII)

Apatyakara Ghrita (*Shamana* Group) significantly increased sperm count by 41.42%, motility by 37.5%, volume by 20.36%, viscosity by 28.57%, sexual desire by 23.33%, erectile function by 24.14%, erectile rigidity by 45.45%, ejaculation function by 20.59%, orgasmic function by 21.21%, *maithune Ashakti* by 41.47%, *Medhra-Vrushana Vedana* by 60% and *Alpashukrata* by 57.14%. (Table – 3, 5&7)

In this group 30% got complete remission, 40% markedly improved while 30% had moderate improvement. (Chart – VIII)

Unpaired 't' test was applied to compare the efficacy of *Virechana Purvaka Shamana* and only *Shamana*. Statistically insignificant results were obtained in most of parameters, other than *Alpa Shukrata* and Volume of semen, where *Virechana Purvaka Shaman* was found significant.

Statistically, it means that *Apatyakara Ghrita* with and without *Virechana*, found equally significant in most of parameters of this study.

DISCUSSION

In this study, maximum patients were from 26-30 (35%) year of age, again distribution according to *Vaya* reveals that 65% were from *Sampurnata* stage of *Vaya*. Fear, mental tension, unwholesome food

habits, improper regimen are come in the way and this leads to vitiation of biological humors. Also young age is the *Pitta Pradhana Avastha* and along with it above factors vitiate *Vata Dosha*. Also, it is clear that this is the prime age for reproduction.

Majority of the patients were from 1-4 year of marital life span i.e. 45%. Generally couples do not take infertility seriously in the beginning or so many of them are using different contraceptives in earlier married life. But as the time pass, they see a lacuna that wife has not conceived yet and then they are worried about it. After trying house remedies and other folk lore medicines, they came at specialty clinics.

Maximum 25% of patients were affected by *Jwara*. *Jwara* may be the cause of poor semen quality¹³ and alteration in spermatogenesis may takes place by apparently harmless illness such as typhoid fever. Mumps was observed in 20% of patients. It may cause blockage of vas deferens, which may result in subsequent testicular atrophy or impairment of infertility.

55% were using hot water regularly for *Snana* and excessive use of hot water for bathing leads to increase temperature locally that leads to deviation in spermatogenesis. Maximum of patients were taking *Amla-Katu Vipaki Dravya*, followed by *Katu-Tikta-Kashaya* in excess. *Atisevana* of *Ruksha-Laghu-Ushna-Tikshna Gunatmaka Ahara dravya* and *Alpa-Pramitashana* etc. faulty dietary habits leads to *Shukra Kshaya*.¹⁴ Routinely ingestion of *Avrushya* substances like coriander, black pepper, fennel, excessive use of *Kshara (alkali)* etc. deteriorates the condition.

This type of *Nidana* leads to the production of *Ama* in the body provokes

Vata and *Pitta Dosha* and vitiation of *Agni*. These factors are stated to be the basic cause for beginning of the *Samprapti Nirmana*.

Effect of Virechana Karma: *Shukra* is *Saumya* i.e. *Jala Mahabhuta Pradhana*. In the pathogenesis of *Kshina Shukra*, there is involvement of *Pitta* and *Vata*. *Pitta* is *Agneya Mahabhuta Pradhana*, while *Shukra* is *Jala Mahabhuta Pradhana*, so in order to increase the *Saumyata* one has to decrease the *Agni Tatva*, which can be achieved through *rhashahetuvisheshasya* principle. In order to remove the vitiated *Pitta Dosha*, *Virechana* is administered. The active principles of *Virechaka Dravya* are believed to be *Soma* and *Pruthvi* dominant, as described earlier *Shukra* is *Saumya Pradhana*. It also eliminates the *Srotorodha* and active transformation of *Dhatu* through *Dhatvagni Vyapara* and the most desirable *Shuddha Shukra* is procured.

The whole process helps in removing the free radicals (oxidants) present in the micro circulatory channels of *Shukra Vaha Srotasa*, which interferes with the function of *Shukra* and by doing so, increases the activity of *Shukra* (motility) as well as *Shukra Vaha Srotasa* and the respective *Dhatvagni* thereby facilitating the production of more *Shukra Dhatu*. (Volume, Count). *Virechana* may be responsible for rectifying the *Pitta Dhara Kala*, as it is the main procedure for *Pitta Shodhana*. According to *Acharya Dalhana*, *Pitta Dhara 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 *Shuddha Shukra*. There may also be some relation between *Pitta Dhara Kala*

and *Shukra Dhara Kala* as the sequence of discription, given by *Acharya Sushruta* is 6th and 7th respectively.

CONCLUSION

The application of *Virechana* is a broad spectrum clinical modality, and well known purificatory process for *Pitta Do-sha*. *Srotosuddhi* is achieved by its virtue of *Shodhana*, and thus it improves the *Dhatu Poshana Krama*. Statistically as

well as clinically good results were obtained in both the groups, that means both the therapies are effective in the management of *Kshina Shukra* but *Virechana Purvaka Shamana* is more effective than only *Shamana* therapy.

Chart – I, Distribution of 20 patients of Kshina Shukra according to Age, Sex etc.

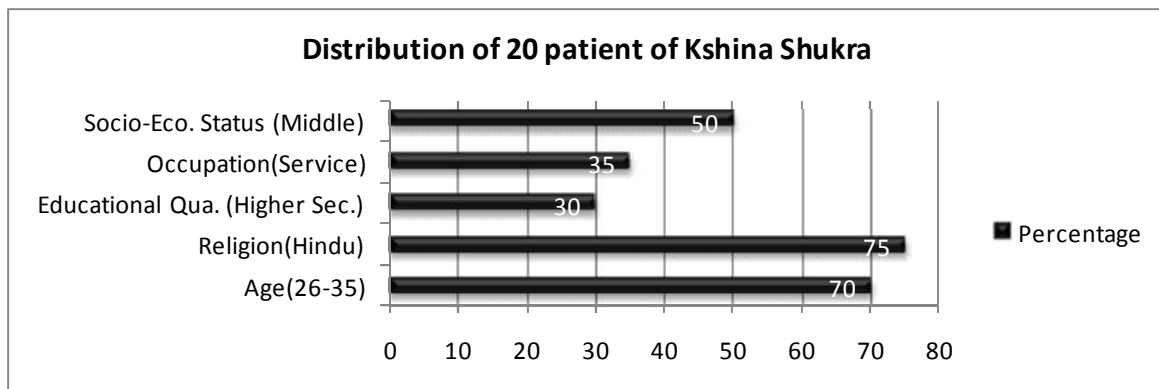


Chart – II, Distribution of 20 patients of Kshina Shukra according to Family history, addiction etc.

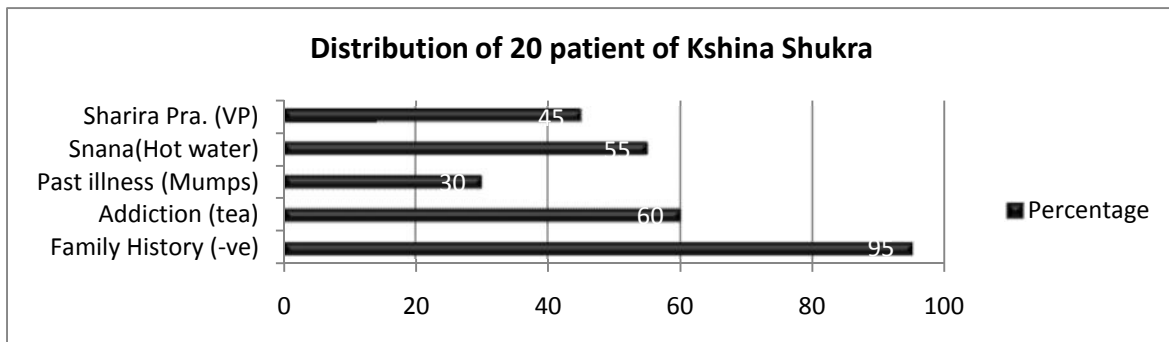


Chart – III, Distribution of 20 patients of Kshina Shukra according to Sara, Satva etc.

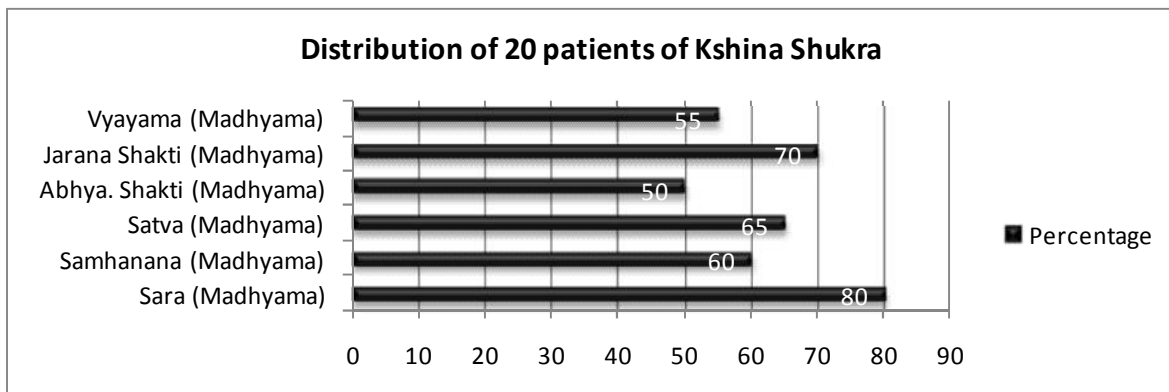


Chart – IV, Distribution of 20 patients of Kshina Shukra according to Coitus, NE etc.

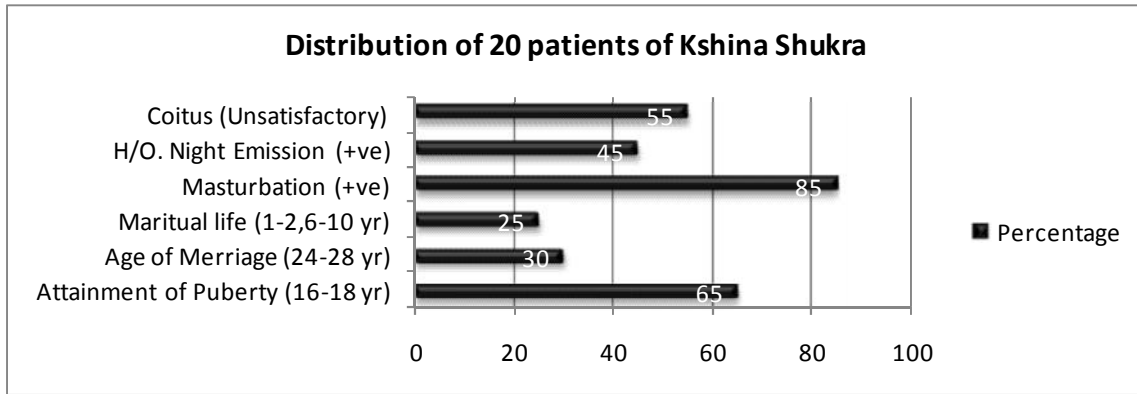


Chart – V, Distribution of 20 patients of Kshina Shukra according to chief complain

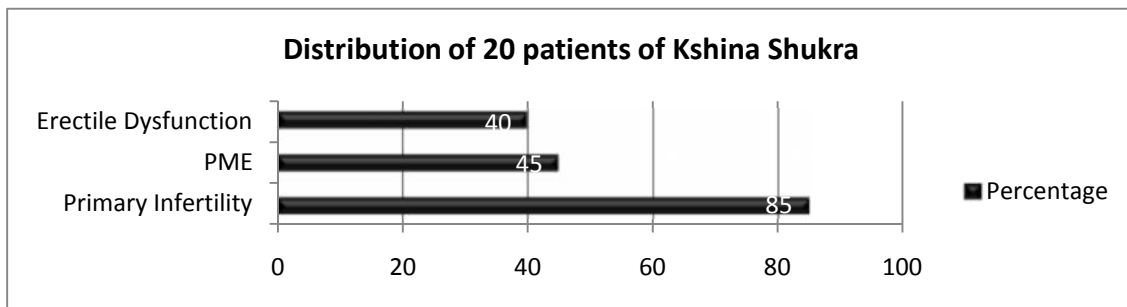


Chart – VI, Distribution of 10 patients of Kshina Shukra according to Snehapana and Virechana

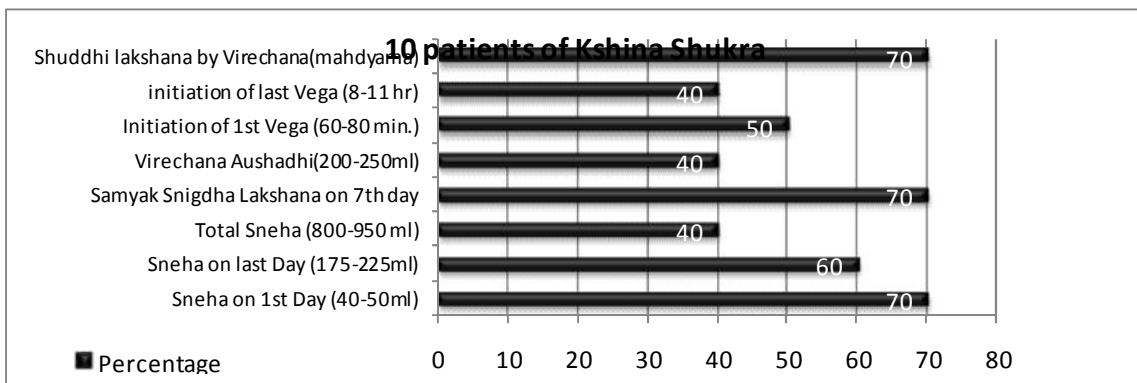


Chart – VII, Distribution of 20 patients of Kshina Shukra according to Nidana

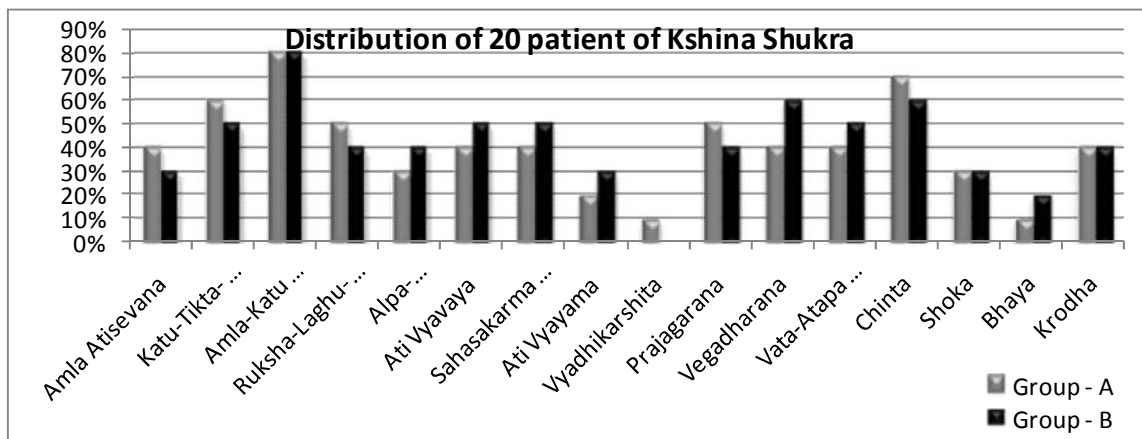


Chart – VIII, Distribution of 20 patients of Kshina Shukra according to Effect of therapy

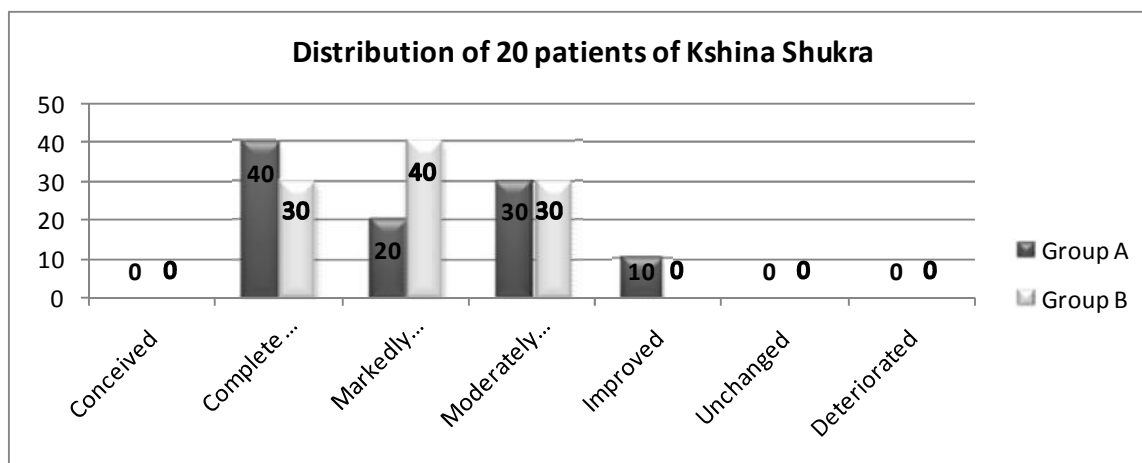


Table – 1 – Lakshana wise distribution of 20 patients of Kshina Shukra

Lakshana	No. of patients				Total	
	Group A		Group B			
Bhrama	04	40%	05	50%	09	45%
Daurbalya	08	80%	07	70%	15	75%
Panduta	05	50%	06	60%	11	55%
Shrama	05	50%	06	60%	11	55%
Alpachestata	06	60%	05	50%	11	55%
Klaibya	06	60%	04	40%	10	50%
Maithune Ashakti	09	90%	07	70%	16	80%
Alpa Shukra Pravrutti	07	70%	07	70%	14	70%

Table – 2 – Effect on Semenogram in Group A

Semen parameter	Mean Score		D	% Re-lief	S.D. ±	S.E. ±	T	P
	B.T.	A.T.						
Total Sperm Count	7.9	14.8	6.9	87.34	2.96	0.93	7.37	<0.001
Motility	22.5	38.5	16	71.11	9.37	2.96	5.40	<0.001
Volume of semen	2.5	3.38	0.88	35.2	0.41	0.13	6.82	<0.001
Viscosity of semen	2.7	1.8	0.9	33.33	0.74	0.23	3.86	<0.01

Table – 3 – Effect on Semenogram in Group B

Semen parameter	Mean Score		D	% Re-lief	S.D. ±	S.E. ±	T	P
	B.T.	A.T.						
Total Sperm count	12.4	17.5	5.1	41.42	3.31	1.04	4.87	<0.001
Motility	28	36.5	10.5	37.5	7.61	2.40	4.36	<0.001
Volume of semen	2.8	3.37	0.57	20.36	0.34	0.11	5.25	<0.001
Viscosity of semen	2.8	2	0.8	28.57	0.63	0.2	4	<0.01

Table – 4 – Effect on sexual health parameter in Group A

Sex. health parameter	Mean Score		D	% Relief	S.D. ±	S.E. ±	T	P
	B.T.	A.T.						
Sexual Desire	2.4	3.4	1	41.67	0.47	0.15	6.71	<0.001
Erection	2.4	3.3	0.9	37.5	0.56	0.18	5.01	<0.001
Rigidity	0.9	1.5	0.6	66.67	0.52	0.16	3.67	<0.01
Ejaculation	2.3	3.2	0.9	39.13	0.32	0.1	9	<0.001
Orgasm	1.9	2.8	0.9	47.37	0.57	0.18	5.01	<0.001

Table – 5 – Effect on sexual health parameter in Group B

Sex. health parameter	Mean Score		D	% Relief	S.D. ±	S.E. ±	T	P
	B.T.	A.T.						
Sexual Desire	3	3.7	0.7	23.33	0.48	0.15	4.58	<0.001
Erection	2.9	3.6	0.7	24.14	0.48	0.15	4.58	<0.001
Rigidity	1.1	1.6	0.5	45.45	0.53	0.17	3	<0.01
Ejaculation	3.4	4.1	0.7	20.59	0.67	0.21	3.28	<0.01
Orgasm	3.3	4	0.7	21.21	0.67	0.21	3.28	<0.01

Table – 6 – Effect on sign and symptom in Group A

Sign & Symptoms	Mean Score		D	% Relief	S.D. ±	S.E. ±	T	P
	B.T.	A.T.						
Maithune Ashakti	2.1	1	1.1	52.38	0.57	0.18	6.12	<0.001
Medhra-Vrushana Vedana	0.6	0.2	0.4	66.67	0.51	0.16	2.45	<0.05
Praseke Alpashukrata	1.4	0.4	1	71.42	0.47	0.15	6.71	<0.001

Table – 7 – Effect on sign and symptom in Group B

Sign & Symptoms	Mean Score		D	% Relief	S.D. ±	S.E. ±	T	P
	B.T.	A.T.						
Maithune Ashakti	2.43	1.43	1	41.17	0.58	0.22	4.58	<0.001
Medhra-Vrushana Vedana	0.5	0.2	0.3	60	0.48	0.15	1.96	<0.05
Praseke Alpashukrata	0.7	0.3	0.4	57.14	0.52	0.16	2.45	<0.05

Table – 8 – Effect on oligozoospermic grade in Group A

Grade	B.T.		A.T.	
	No.	%	No.	%
Very severe (<5)	03	30%	00	00%
Severe (5-10)	03	30%	03	30%
Moderate (10-15)	03	30%	02	20%

Mild (15-20)	01	10%	01	10%
Normal (>20)	00	00%	04	40%
TOTAL	10	100%	10	100%

Table – 9 – Effect on oligozoospermic grade in Group B

Grade	B.T.		A.T.	
	No.	%	No.	%
Very severe (<5)	00	00%	00	00%
Severe (5-10)	03	30%	00	00%
Moderate (10-15)	03	30%	03	30%
Mild (15-20)	04	40%	04	40%
Normal (>20)	00	00%	03	30%
TOTAL	10	100%	10	100%

Table – 10 – Improvement in oligozoospermic grade in Group A

Grade	B.T.	After Treatment (in %)				
	(in %)	VS	Se.	Mo.	Mi.	No.
Very severe (<5)	30	-	30	-	-	-
Severe (5-10)	30	-	-	20	10	-
Moderate (10-15)	30	-	-	-	-	30
Mild (15-20)	10	-	-	-	-	10
Normal (>20)	00	-	-	-	-	-

Table – 11 – Improvement in oligozoospermic grade in Group B

Grade	B.T.	After Treatment (Patients wise data)				
		VS	Se.	Mo.	Mi.	No.
Very severe (<5)	00	-	-	-	-	-
Severe (5-10)	03	-	-	03	-	-
Moderate (10-15)	03	-	-	-	02	01
Mild (15-20)	04	-	-	-	02	02
Normal (>20)	00	-	-	-	-	-

REFERENCES

1. Acharya Agnivesha, Charaka Samhita elaborated by Charaka and Dradhabala with the Ayurveda Deepika Commentary by Chakrapanidatta, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surabharati Prakashana – Varanasi, Reprint Edition 2008, Chikitsa Sthana, 2nd Chapter – Vajikarana Chikitsita, 1st Pada – Sa-nyogasara Muliya Pada, Verse No. 16-17, Page No. 391
2. Trevor G. Cooper et al, World Health Organization reference values for human semen characteristics, Human Reproduction Update, Vol.00, No.0 pp. 1–15, 2009 doi:10.1093/humupd/dmp048, published on December 4, 2009
3. Acharya Sushruta, Sushruta Samhita with Nibandhasangraha commentary of Shri Dalhanacharya and Nyayachandrika Panjika of Shri Gayadasacharya on Nidana Sthana, Edited by Vaidya

- Jadavaji Trikamaji Acharya, Published by Chaukhamba Surbharati Prakashana – Varanasi, Reprint 2008, Sharira Sthana, 2nd Chapter – Shukrashonita Shuddhi Sharira, Verse No. 4, Page No. 344
4. Acharya Sushruta, Sushruta Samhita with Nibandhasangraha commentary of Shri Dalhanacharya and Nyayachandrika Panjika of Shri Gayadasacharya on Nidana Sthana, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surbharati Prakashana – Varanasi, Reprint 2008, Sutra Sthana, 1st Chapter – Vedotpatti Adhyaya, Verse No. 8, Page No. 3
 5. Acharya Sushruta, Sushruta Samhita with Nibandhasangraha commentary of Shri Dalhanacharya and Nyayachandrika Panjika of Shri Gayadasacharya on Nidana Sthana, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surbharati Prakashana – Varanasi, Reprint 2008, Sharira Sthana, 2nd Chapter – Shukrashonita Shuddhi Sharira, commentary on Verse No. 6, Page No. 345, Line No. 24
 6. Acharya Agnivesha, Charaka Samhita elaborated by Charaka and Dradhabala with the Ayurveda Deepika Commentary by Chakrapanidatta, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surabharati Prakashana – Varanasi, Reprint Edition 2008, Sutra Sthana, 16th Chapter, Chikitsaprabhrutiya Adhyaya, Verse No. 17-18, Page No. 97
 7. Acharya Agnivesha, Charaka Samhita elaborated by Charaka and Dradhabala with the Ayurveda Deepika Commentary by Chakrapanidatta, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surabharati Prakashana – Varanasi, Reprint Edition 2008, Chikitsa Sthana, 2nd Chapter – Vajikarana Chikitsita, 1st Pada – Sanyogasara Muliya Pada, Verse No. 50-51, Page No. 392
 8. Acharya Vagbhata, Ashtanga Hradaya with the commentaries of Arunadatta and Hemadri, Collated by Late Dr. A. M. Kunte and K. R. S. Navare, Edited by Harishashtri Paradakara Vaidya, Chaukhamba Orientalia – Varanasi, Reprint Ninth Edition – 2005, Sutra Sthana, 1st Chapter – Ayushkamiya Adhyaya, Verse No. 25, Page No. 16
 9. Acharya Agnivesha, Charaka Samhita elaborated by Charaka and Dradhabala with the Ayurveda Deepika Commentary by Chakrapanidatta, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surabharati Prakashana – Varanasi, Reprint Edition 2008, Chikitsa Sthana, 30th Chapter, Yonivyapata Chikitsita, Verse No. 196, Page No. 642
 10. Vruddha Jivaka, Kashyapa Samhita revised by Vatsya with Sanskrit introduction by Pandit Hemaraja Sharma with Vidyotini Hindi commentary by Srisatyapala Bhisagacharya, Published by Chaukhambha Sanskrita Sansthana – Varanasi, Reprint edition – 2008, Siddhi Sthana – Trilakshana Siddhi, Line No. 10-11
 11. Acharya Agnivesha, Charaka Samhita elaborated by Charaka and Dradhabala with the Ayurveda Deepika Commentary by Chakrapanidatta, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surabharati Prakashana – Varanasi, Reprint Edition 2008, Chikitsa Sthana, 2nd Chapter –

- Vajikarana Chikitsita, 4th Pada – Ma-shaparnabhrutiya Pada, Verse No. 28-29, Page No. 396
12. Vaidya Bhaskara V. Gokhale, Chikitsa Pradipa, 2nd Edition, published in 1961, Aushadhinam Kalpanam Patha, Page No. 141
13. Macleod J and Hotchkiss RS, the effect of hyperpyrexia upon spermatozoa counts in men. In: Mieusset R and Bujan L (1995) Testicular heating and its possible contributions to male infertility: review: II of Andrology 18: 169-184. (1941)
14. Acharya Agnivesha, Charaka Samhita elaborated by Charaka and Dradhabala with the Ayurveda Deepika Commentary by Chakrapanidatta, Edited by Vaidya Jadavaji Trikamaji Acharya, Published by Chaukhamba Surabharati Prakashana – Varanasi, Reprint Edition 2008, Sutra Sthana, 27th Chapter & Chikitsa Sthana 30th Chapter.

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