

AN OBSERVATIONAL STUDY ON SHUKRA PAREEKSHA- ANCIENT AND CONTEMPORARY METHODS

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Received: 30-01-2016; Revised: 29-03-2016; Accepted: 31-03-2016

Abstract

Shukra is considered as one of the seven dhatus and is assigned with the function of bestowing the progeny. Shukra is correlated with semen and the semen is assessed to find out the pathology for infertility. An attempt was made to objectivise the parameters of semen analysis and classify semen analysis based on doshic predominance. A total of 143 individuals aged between 16 to 60 years who were undergoing semen analysis for various causes were selected for the study. Based on physical features, normal semen was classified into different doshic groups such as Vataja Shukra, Pittaja Shukra and Kaphaja Shukra. Pathological semen was analyzed and the components of semen analysis were correlated with Ayurvedic parameters of Shukra Pareeksha.

Key words: Semen Analysis; Shukra Pareeksha; Shukra; Shukra Dushti.

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Cite This Article

Bhavana KR, Anand Katti, Shreevathsa. An observational study on shukra pareeksha - Ancient and contemporary methods. Ayurpharm Int J Ayur Alli Sci. 2016;5(5):59-67.

INTRODUCTION

In all the classical text books of Ayurveda, Shukra (semen) and Shukra dushti (vitiation of semen) are mentioned in detail but the information is scattered. Physical examination of Shukra is also told to diagnose the underlying pathology. Nowadays, semen analysis is done to find out the cause for infertility.

This study was carried out to correlate the parameters of semen analysis from an Ayurvedic perspective and simultaneously validate the Shukra Pareeksha (semen examination) told in classical Ayurvedic literature.

MATERIALS AND METHODS

For the present study, semen samples were collected from Mediwave Infertility and I.V.F. Research Centre, Mysore. A total of 143 samples were collected and analysed. A proforma to assess doshic predominance in the samples was made.

For semen analysis, instruments used were microscope, Makler's chamber, calibrated pipette, clock, pH indicating paper, haemocytometer and certain reagents. Diluting fluid consisted of Sodium bicarbonate - 5g, Formalin – 1ml and Distilled water - 100ml. Following liquefaction, semen was drawn till 0.5ml and diluting fluid upto 11ml and mixed properly.

Before collection of the ejaculate, the subjects were told to observe a minimum of 3 days and maximum of 5 days of abstinence.^[1]

Masturbation method was followed and the laboratory supplied a dried and wide mounted plastic container for sample collection. The parameters of semen analysis and the method employed to assess are given in Table 1.

Assessment of Ayurvedic parameters

The physical characters of Shukra told in different Ayurvedic classical books were compiled and assessed. The parameters considered for the study were Colour, Odour and Appearance, Volume, Consistency, Density, Viscosity and Ejaculatory pain.

Colour, Odour and Appearance were assessed on organoleptic basis. Ejaculatory pain was assessed by asking questions like whether the ejaculation was associated with pain / burning sensation / itching.

Viscosity was assessed by glass rod technique. It was carried out and samples were graded into 0, 1, 2, 3, 4 on the basis of thread formed. (Table 2)

Tila taila (Sesame oil) and cow's ghee were obtained from Nesara organic farm, Mysuru and Coorg honey was procured to standardize the viscosity.

Consistency was assessed based on its appearance after liquefaction as Tanu (thin) / Drava (liquid) / Sandra (dense) / Grantibhuta (nodular).

Statistical interpretation was based on Descriptive statistics, Chi-square test and Contingency table analysis using SPSS for windows software.

OBSERVATIONS

In the present study, 143 individuals undergoing semen analysis for various reasons were selected. Out of 143 individuals, 71 persons showed normal study of semen analysis and 72 had certain pathological conditions. (Table 3)

Table 1: Parameters and the assessment methods of Semen analysis

Parameter	Method
Colour	Observation method.
Volume	Measured using calibrated pipette.
LiquefactionTime	The time between collection and liquefaction was noted
Viscosity	Observation method.
pH	Ph indicator paper.
Total Sperm Count	Evaluated using Makler's chamber.
Motility	Evaluated in percentages.
Morphology	Head, mid piece and tail defects were expressed in percentages.
Vitality	Sample, eosin and nigrosin were taken in the ratio of 1:2:3 and smear was prepared and observed under oil immersion. Live cells appeared white while dead cells appeared pink.
Pus cells	Peroxidase reagent
Agglutination	The clusters of sperms in squares of Makler's chamber were noted
Fructose test	Selivnoff's test

Table 2: Grading of the Pichchilata based on the length of the thread formed

Grading	Reference	Length of the thread formed
0-	Apichchila	No thread formation
1-	Tailabha	0.5cm – 1 cm
2-	Grutabha	1-1.5cm
3-	Madhwabha	1.5-2cm
4-	Atipichchila	More than 2cm

Table 3: Conditions found in the study

Sl.No	Condition	No. of cases
1	Normal study	71
2	Agglutination	16
3	High viscosity	3
4	Hyospermia	9
5	Oligospermia	1
6	Asthenozoospermia	1
7	Pyospermia	1
8	Necrozoospermia	5
9	Asthenonecrozoospermia	5
10	Hyospermia pyospermia with high viscosity	2
11	Pyospermia with high viscosity	1
12	Hyospermia with agglutination	1
13	Oligoasthenoteratonecrozoospermia	5
14	Oligoasthenoteratonecrozoospermia with hyospermia	3
15	Necrozoospermia with high viscosity	1
16	Hyospermia with high viscosity	2
17	Asthenonecrozoospermia with hyospermia	3
18	Asthenonecrozoospermia with high viscosity	1
19	Necrozoospermia hyospermia with high viscosity	3
20	Asthenonecrozoospermia with hyospermia	1
21	Asthenonecrozoospermia with hyospermia and high viscosity	1
22	Asthenozoospermia hyospermia high viscosity of semen with agglutination	1
23	Oligoasthenoteratonecrozoospermia hyospermia with high viscosity	4
24	Oligoasthenoteratonecrozoospermia, pyospermia with hyospermia	1
25	Asthenozoospermia hyospermia high viscosity of semen	2

DISCUSSION

The pathological Shukra is considered to understand the components of semen analysis from an ayurvedic perspective.

Colour

It is correlated with the Varna and is perceived through Chakshu (visual perception). In contemporary medicine, normal semen is considered to be greyish white or white in colour. Semen is yellowish in jaundice and reddish brown when it is associated with blood.^[2] Prakruta Shukra (normal semen) is Sphatikabha (colour of Quartz stone) or Shukla (white). Based on Prakruti, it can be of the colour of Taila (oil) in Vata prakriti, Gruta (ghee) in Pitta or Madhu (honey) in Kapha. Vitiated Shukra is also discoloured. (Table 4)

In the present study however, only Sphatikabha and Shukla Varnayukta Shukra were found. Out of 143, 140 samples were Sphatikabha and among them 140 (100%) were having greyish white colour. Only 3 samples had Shukla Varna, out of which all 3 (100%) were whitish. ($P < 0.000$). Table 5 shows cross tabulation between colour and varna.

Pus Cells and Puti Gandha (foul smell)

Gandha (smell) is perceived through ghranendriya (nose). Ayurveda speaks about three types of Gandha. Normal Shukra has Madhu gandha (smell of honey), Pitta Dooshita has Puti Gandha (with foul smell) and Kapha dooshita has Visra gandha.

Puti is due to Pittaja Shukra Dushti. Inflammatory conditions leads to the secretion of pus. Pus has an odour because it contains anaerobic bacteria, which prefer deoxygenated environment. The bacteria produce some sulphur compounds, which have a strong odour. (Table 6)

Statistically too, there is a highly significant association between Gandha and pus cells with contingency co efficient of 0.553 and $P < 0.000$. Among 137 samples which had the absence of pus cells, 114 (83.2%) exhibited Madhu gandha and out of 6 samples of pyospermia, 5 (83.5%) had the presence of pus cells. Table 7 shows cross tabulation between gandha and pus cells.

Volume

Alpa (less quantity) is due to Vata dushti and refers to low volume and hence correlates with hypospermia while Bahu (more) is because of Kapha dushti and is assessed by high volume of semen which relates with hyperspermia.

Pramana of Shukra is said to be 2 Anjali, but this applies more to Sarvashareeragata shukra (shukra found all over the body) and not to Roopa dravya (ejaculatory semen). 1.5- 6 ml is considered as normal quantity of semen. Hence semen quantity less than 1.5 which leads to infertility is taken as Alpa and the semen which is more than 6 ml is considered as Bahu.

In the present study, no cases of hyperspermia were found. However, 31 (21.3%) samples out of 143 were hypospermic.

Liquefaction Time and Appearance

It is correlated with the appearance told in the Ayurvedic classics. Sphatikabha is when liquefaction time is normal and Gratita Shukra shows prolonged liquefaction time. Normally semen liquefies within 15 min of ejaculation but can take upto one hour to liquefy. Liquefaction of semen is due to coagulating proteins originate within the seminal vesicles and coagulating enzymes are derived from the prostate gland. Absence of coagulation indicates ejaculatory duct obstruction or congenital absence of seminal vesicles. Prolonged liquefaction time is due to poor prostatic secretion. (Table 8)

Table 4: Varna of Shukra based on Dosha

Dosha	Varna	Meaning
Vata	Aruna Varna	Reddish brown ^[3]
	Krishna Varna	Black ^[4]
Pitta	Peeta Varna	Yellow ^[5]
	Neela Varna	Blue/green/black ^[6]
Kapha	Shukla Varna	Whitish ^[7]

Table 5: Colour × Varna tabulation

Colour	Varna		Varna		Total
			Sphatikabha	Shukla	
Greyish white	Count		140	0	140
		%	100%	0%	97.9%
White	Count		0	3	3
		%	0%	100%	2.1%
Total	Count		140	3	143
		%	100.0%	100.0%	100.0%

Table 6: Gandha of Shukra based on Dosha dushti

Dosha	Gandha	Meaning
Pitta	Puti	Foul smelling ^[8]
Kapha	Visra	Smell of raw meat ^[9]
Normal	Madhu	Smells like honey

Table 7: Gandha × Pus cells tabulation

Gandha	Pus cells		Pus cells		Total
			Absent	Present	
Madhu	Count		114	1	115
		%	83.2%	16.7%	80.4%
Puti	Count		4	5	9
		%	2.9%	83.3%	6.3%
Visra	Count		19	0	19
		%	13.9%	0%	13.3%
Total	Count		137	6	143
		%	100.0%	100.0%	100.0%

Table 8: Appearance × Liquifaction time tabulation

Liquifaction time	Appearance		Appearance		Total
			Sphatikabha	Gratita	
Normal	Count		123	0	123
		%	96.8%	0%	86.01%
Abnormal	Count		4	16	20
		%	3.2%	100%	13.99%
Total	Count		127	16	143
		%	100.0%	100.0%	100.0%

In the present study, out of 143 samples, 20 had abnormal viscosity. Out of these 20, 16 had Gratita appearance while 123 had normal liquefaction time and out of that 123 were Sphatikabha. (Significance was $P > 0.000$)

Viscosity and pichhilata (Stickyness)

Pichchila is the property of a substance to stick. It is said as slimy, lubricous, slippery, smeary etc. Viscosity on the other hand is the resistance offered by the liquid to flow. The liquid does not flow owing to its stickiness. The molecules of the liquid bind with one another and to the surface and resist to flow.

In contemporary medicine, viscosity is termed as normal or abnormal based on liquefaction time. Ayurvedic parameters of viscosity are Apichchila (non viscous), Tailabha (oil like), Gritabha (ghee like), Madhwabha (honey like) and Atipichchila (highly viscous).

Apichchila / Ruksha

High Alkaline pH correlates with Ruksha Shukra dushti. Acidic pH indicates Pitta Vruddhi and alkaline pH is due to Vata Vruddhi. Ruksha is one of the Atma Gunas (base quality) of Vata and hence high alkaline pH can be taken as Apichchila (Ruksha). In high alkaline pH, semen loses its buffering capacity in ecto-cervical media and required pH (6.3) for sperm motility is lost and sperm motility is hampered.^[10]

In the present study, no case of Apichchila Shukra or high alkaline pH was found.

Tailabha / Ghritabha / Madhwabha

Viscosity is similar to that of Taila, Grita or Madhu depending on Vata, Pitta and Kapha Prakruti respectively. All the three are considered to be normal.

Atipichchila

Ati pichilatva is hyper-viscosity of semen which is responsible for impaired motility. Pichchhila is the property of binding. Charaka Samhita has quoted this pathology as “Shleshmanam Baddhamarga”. It indicates Shukravaha Sroto Rodha Gati Avarodha (the impairment in the motility of spermatozoa). After ejaculation, further progression of Spermatozoa is hampered due to obstruction in reproductive path.

Statistically, there is a significant association between the viscosity of Ayurvedic classics to the viscosity accepted by the contemporary science with contingency coefficient of 0.686 and a significance of 0.000. Out of 20 Atipichchila semen samples 19 (95%) had abnormal viscosity and out of 123 samples which had normal viscosity, 122 were grouped under Tailabha, Kshoudrabha and Gritabha (like oil, honey and ghee respectively). (Table 9)

Semen consistency and sperm count

Consistency is the degree of firmness.^[11] In Ayurveda, with respect to Shukra, it can be expressed in terms of Tanu, Drava, Sandra and Grantibhuta. Consistency of semen is examined after complete liquefaction

Tanu

It is a feature of Vataja Shukra dushti. Tanu Shukra is the condition in which semen is translucent or transparent. This is due to diminished nutrient value of seminal plasma as well as diminished concentration of Spermatozoa in seminal fluid. This condition can correlate with Oligospermia. In further progressive pathogenesis, it also affects motility of Spermatozoa due to increased surface tension. Increased surface tension of seminal plasma may alter the penetration of the spermatozoa into cervical mucus to poor migration.^[12]

Table 9: Viscosity × Pichchilata tabulation

		Pichchilata					Total
		Apicchila	Atipicchila	Taila	Madhu	Grita	
Viscosity	Normal	0 0%	1 5.0%	26 100.0%	23 95.8%	72 100.0%	123 86.0%
	Abnormal	0 .0%	19 95.0%	0 .0%	1 4.2%	0 .0%	20 14.0%
Total		0 100.0%	20 100.0%	26 100.0%	24 100.0%	72 100.0%	143 100.0%

Table 10: Consistency × Count tabulation

			Normal	Less	Total
			Count	Count	
Consistency	Tanu	Count	9	10	19
		% of Count	7.1%	62.5%	13.3%
	Drava	Count	105	2	107
		% of Count	81.9%	12.5%	74.1%
	Sandra	Count	6	2	8
		% of Count	4.7%	12.5%	5.6%
Grathita	Count	7	2	9	
	% of Count	5.5%	12.5%	6.3%	
Total		Count	127	16	143
		% of Count	100.0%	100.0%	100.0%

Table 11: Vedana × Count tabulation

			Count		Total
			Normal	Less	
Vedana	Avidahi	Count	105	9	114
		% of Count	82.7%	56.3%	79.7%
	Ruja	Count	8	4	12
		% of Count	6.3%	25.0%	8.4%
	Daha	Count	1	0	1
		% of Count	0.8%	0.0%	0.7%
	Kandu	Count	12	3	15
		% of Count	9.4%	18.8%	10.5%
	Ruja&Daha	Count	1	0	1
		% of Count	0.8%	0%	0.7%
Total		Count	127	16	143
		% of Count	100.0%	100.0%	100.0%

Table 12: Correlation between Ayurvedic and Contemporary Parameters

Sl.No.	Ayurvedic parameter	Contemporary parameter	P value
1	Varna	Colour	0.000
2	Putigandha	Pus cells	0.000
3	Madurata	Fructose	-
4	Pichchilata	Viscosity	0.000
5	Ruksha	Alkaline pH	-
6	Consistency	Sperm count	0.000
7	Appearance	Liquefaction time	0.000

Table 13: Doshic involvement of pathological conditions of semen

Sl. No	Condition	Ayurvedic diagnosis	Dosha
1	Oligospermia	Tanu	Vata
2	Pyospermia	Puti	Pitta
3	Agglutination	Gratita	Kapha
4	High viscosity	Grantibhoota	Kapha
5	Necrozoospermia	Avasaadi	Vata
6	Hypospermia	Alpa	Vata
7	Hyperspermia	Bahu	Kapha
8	Asthenospermia		Vata

Drava / Sandra

These are Shuddha Shukra Lakshana (qualities of pure semen). The Shukra which is clear is considered to be Drava. After complete liquefaction there may be some granules present in the semen, which is of no clinical importance. That is considered as Sandra.

Granthi bhoota

Agglutination of semen can be taken as Granthibhoota Shukra. It is due to Kapha Dushti.

There is a highly significant association between semen consistency and sperm count with contingency co-efficient of 0.489 and $P < 0.000$. Among 127 normal samples 105 (81.9%) had Drava consistency. Out of 16 oligospermic semen, 10 (62.5%) had Tanu consistency.

Fructose test and madurata (sweetness)

Presence of fructose shows Madhurata of the semen which is one of the characteristics of Shuddha Shukra. Acidic pH generally correlates with absence of fructose. Here quality of seminal fluid will be altered, which will lead to lack of nutrients to spermatozoa. This condition will hamper forward progression of spermatozoa.^[13] In the present study, no case of absence of fructose was seen.

Avasaadi and Necrospermia

It is due to Vataja Shukra Dushti. The dictionaries give its meaning as Vinaasa (destroyed), Swakarma Akshamatva (non-functional).^[14] Hence it can be taken as necrozoospermia. In the present study, out of 143 samples, 32 cases of low vitality were seen.

Semen density and guru – laghavata of shukra

Density is described as compactness. In contemporary medicine, this test is generally not done. A study conducted on semen samples assessing the semen density by weight/ volume over individuals having oligospermia, azoospermia and normospermia has shown that there is no significant relation between semen density and sperm counts.^[15] Hence the components of semen will be deranged in the semen which shows low density.

In Ayurveda, with respect to Shukra, density can be expressed as Ghana (heavy) and Laghu (light weight). Guru / Ghana represent normalcy while Laghu represent Vata Dushti.

Vedhana (Pain)

It is assessed through Prashna Pareeksha (interrogation). It can be Ruja / Daha / Kandu (Pain / Burning sensation / Itching).

Among the main causes of pain experienced at ejaculation / orgasm are, prostatevesicular causes (LUTS / BPH, prostatitis, ejaculatory duct obstruction, vesicular stone), postsurgical causes (radical prostatectomy, inguinal hernioplasty), pharmacologic causes (antidepressants) and psychogenic causes (psychosexual conflicts, sexual abuse).^[16]

In the present study also, there was no relation found between vedana (pain) and sperm count. (Table 11)

CONCLUSION

Pathology of Shukra can be understood with the help of semen analysis. Out of 143, 72 were pathological semen. After a close observation, a highly significant association was found between Varna and colour, Pichchilata and viscosity, pus cells and Puti Gandha, consistency of Shukra and sperm count, liquefaction time and appearance. The Ayurvedic parameters of Shukra Pareeksha are valid even today and can be correlated with the components of semen analysis.

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Source of Support: Nil

Conflict of Interest: None Declared