

**OBSEVATIONAL CROSS-SECTIONAL ANALYTICAL STUDY OF SHUKRA DHATU IN
STHAULYAJANIT PRAMEHA (TYPE-2 DIABETES MELLITUS)****Dr. Sharadkumar Maurya^{1*} and Dr. Ravindra S. Dhindhime²**¹PG Scholar, Department of Kriya Sharir, Government Ayurvedic College, Osmanabad, Maharashtra, India.²Professor and HOD, Department of Kriya Sharir, Government Ayurvedic College, Osmanabad, Maharashtra, India.***Corresponding Author: Dr. Sharadkumar Maurya**

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ABSTRACT

Prameha is described as the one of the disease in *Mahagada* by different *Acharyas*. In *Charak Samhita Prameha* divided in to two parts *Sthul* and *Krusha Prameha*.^[1] In *Shushrut Samhita Prameha* divided in to two parts *Sahaj Prameha* and *Apathyanimittaja Prameha*. *Sahaj Prameha* and *Jatah Prameha* correlate with Type-1 Diabetes Mellitus, *Apathyanimittaja Prameha* correlates with Type-2 Diabetes Mellitus. This disease has close ties to *Sthaulya* (i.e.Obesity).^[2] *Staulyajanit Prameha* was elaborately discussed in classics of *Ayurveda* resembling with Type-2 Diabetes Mellitus associated with Obesity. *Prameha* is one of the most common complications of *Sthaulya*. In *Ayurvedic Samhita, Kricchravyavayata* (i.e. there is difficulty in sexual intercourse) is one of the Symptoms of *Sthaulya*. *Shukra Dhatu dushti* is one of the factor in *Prameha* (in *Prameha dushyas Shukra Dhatu* is included).^[3] A research says the prevalence of erectile dysfunction (ED) in men Obesity associated with Diabetes Mellitus range from 20% to 85% when defined as consistent inability to have an erection firm enough for sexual intercourse. The prevalence estimate of ED is over 50.4% in Indian diabetic associated with Obesity men after 40 years or older.^[4] in this study, 30 diagnosed patients of *Sthaulyajanit Prameha* (Obesity associated Type-2 Diabetes Mellitus) and 30 Non-Diabetic (Healthy individuals) were selected. Assessment of *Shukra Dhatu Dushti* and Type-2 Diabetes Mellitus was done by subjective criteria i.e., symptoms and object criteria i.e. by Semen examination.

KEYWORDS: *Shukra Dhatu, Sthaulyajanit Prameha, Type-2 Diabetes Mellitus, Semen Examination.***INTRODUCTION**

In Ayurveda *Dosha, Dhatu* and *mala* described as the basic roots of human living body.^[5,6] *Doshas* are of two types *Sharika* (Somatic) *Dosha* viz. *Vata, Pitta* and *Kapha* and *Manasika* (Psychic) *dosha* viz. *Raja, Tama*. *Dhatu*s are of seven types viz. *Rasa, Rakta, Mamsa, Medas, Asthi, Majja* and *Shukra*. *Malas* are of three types *Purisha, Mutra* and *Sweda*. Among these, *Dhatu*s are the seven fundamental elements that support the basic structure and nourish the body. *Shukra dhatu* is the last developed *dhatu* in *dhatu parinaman kram* of our body. It is considered as the best extract of all *dhatu*s and is responsible for *Bala* of the body. *Shukra* is made up of all *Panchabhautas* i.e. *Akash, Vayu, Agni, Jala* and *Pruthvi*. But it is mainly *Saumyagunapradhana* (*Saumya*). So it is of *Saumya swaroop*.^[7]

In *Charak Samhita Prameha* divided in to two parts *Sthul* and *Krusha Prameha*.^[8] In *Shushrut Samhita Prameha* divided in to two parts *Sahaj Prameha* and *Apathyanimittaja Prameha*. *Sahaj Prameha* and *Jatah Prameha* correlate with Type-1 Diabetes Mellitus, *Apathyanimittaja Prameha* correlates with Type-2 Diabetes Mellitus. This disease has close ties to *Sthaulya* (i.e.Obesity).^[9] All *hetus* which leads to *Prameha*

(Diabetes mellitus) are affect the *kapha dosha*. Hence in *Prameha* (Diabetes mellitus) all types of *kapha dosha* are imbalanced. Vitiation and excessive accumulation of *Meda Dhatu* is the initiative pathology of *Prameha* (Diabetes Mellitus).^[10] *Meda Dhatu* is the dominant *Dushya* in *Sthaulya (Medo Vruddhi)* and *Prameha*, while Obesity and diabetes mellitus are often associated with abnormal lipid levels. *Kapha dosha* and *Meda Dhatu* have *Ashryashrayeebhava*. So *Prameha* associated with *Sthaulya (Medo Vruddhi)*. Diabetes Mellitus (DM) is a chronic disease marked by the elevated blood glucose level. It affects 5-6% of the global adult population. Prevalence of DM type-2 is rising at alarming rates worldwide because of increased urbanization, sedentary lifestyle and stress and high prevalence of obesity.

Shukra Dhatu dushti is one of the factor in *Prameha* (in *Prameha dushyas Shukra Dhatu* is included).^[11] *Prameha* is a *kulaja vikara* and occurs as result of *Beeja dosha*. *Shukra Dhatu* is responsible for reproduction. Therefore vitiation of *Shukra* leads to sex debility and impotency in the patient of *Prameha*. *Acharya Sushruta* has also mentioned that *Vyana* and *Apana* are the causative factors for *Shukra dosha* and *Prameha*. *Medodhatu dushti* is a major factor in pathogenesis of all

types of *Pramehas*. *Meda* vitiation is common and dominant *Dushya* in the pathogenesis of *Madhumeha*. Whatever Obese persons take in food, it gets converted into *Meda* and thus the other next *Dhatu* i.e. *Majja*, *Shukra* remains undernourished leading to *Dhatukshaya*. Due to the over nourishment of *Meda Dhatu* other next *Dhatu* i.e. *Majja* and *Shukra* remains undernourished leading to *Dhatukshaya* and also vitiation of *Vata*. Therefore vitiation of *Shukra* leads to sex disability and impotency in the patient of *Sthalyajanit Prameha*. In *Ayurvedic Samhita*, *Kricchravyavayata* (i.e. there is difficulty in sexual intercourse) is one of the Symptoms of *Sthalya*. *Acharya Charaka* has also described *Daurbalya* as a complication of *Prameha* and Symptoms of *Sthalya*. So one can easily understand the close relation of *Shukra Dushti* in *Sthalyajanit Prameha*. Impotency and testicular hypo functions have been reported in Diabetes Mellitus by Moses et al., 1979.

In present study, 30 diagnosed patients of *Sthalyajanit Prameha* (Obesity associated Type-2 Diabetes Mellitus) and 30 Non-Diabetic (Healthy individuals) were selected. Assessment of *Shukra Dhatu Dushti* and Type-2 Diabetes Mellitus was done by subjective criteria i.e., symptoms and object criteria i.e. by Semen examination. In the present study, vitiation of *Shukra Dhatu* is considered with respect to *Kshaya* and *Vruddhi* symptoms of *Shukra Dhatu* described by *acharyas*, *Panchabhautik parikshan* of *Shukra Dhatu*, the seminal aspect i.e. Semen Analysis.

AIM AND OBJECTIVES

To study the *Shukra dhatu* in patients suffering from *Sthalyajanit Prameha* (Type-2 Diabetes Mellitus). To achieve the objective were, to review the assessment of *Shukra dhatu* in *Sthalyajanit Prameha* (Obesity associated Type-2 Diabetes Mellitus).

MATERIAL AND METHODS

Materials

- Classical sign and symptoms of *Sthalyajanit Prameha*.
- Classical *Lakshanas* of *Shukra Dhatu Kshaya-Vruddhi*.
- Investigations according to Ayurvedic and Modern parameters.
- Semen analysis parameters according to WHO guidelines.

Methods

Patients had classical signs and symptoms of *Sthalyajanit Prameha* were selected for the study from O.P.D. and I.P.D. of our Hospital and by arranging the Diabetic Camps in Hospital, of age group 21 years to 65 years only Male patients. The known cases of *Sthalyajanit Prameha* Male patients were subjected for the study.

Plan of Study: The study was carried out under two headings, viz. Conceptual study and Observational study.

Sample Size: 60 Patients.

Group A: 30 Known cases of *Sthalyajanit Prameha* (Type-2 Diabetes Mellitus) Male patients.

Group B: 30 Non-Diabetic Male individuals (Healthy individuals).

Selection criterion for Healthy individual

- The individual should be non-diabetic.
- Random blood sugar level 70-110 mg/dl.
- The individual having no any severe systemic disorders.
- Chronic complications will be discarded.
- BMI (Body Mass Index) of 18.5 to 24.9 kg/m².
- Waist-Hip Ratio (WHR) < 0.93meter.

A) Inclusive Criteria

1. The Male patients were selected on the basis of classical signs and symptoms of *Sthalyajanit Prameha* (Type-2 Diabetes Mellitus).
2. Patients between Age group of 21 years to 65 years.
3. Patients having history of Type -2 Diabetes mellitus for minimum 5 years.

B) Exclusive Criteria

1. Age of patient less than 21 years and more than 65 years.
2. Female patients.
3. Emergency cases in Type-2 diabetes mellitus.
4. Excessive blood glucose (FBS) > 300 mg/dl.
5. Patients having any other major systemic diseases.
6. Patients suffering from Mumps, Varicocele etc. Diseases which affect the Spermatogenesis.
7. Patients with less than 5 years history of Type-2 Diabetes Mellitus.

Criteria of Assessment

Criteria for Diagnosis of *Sthalyajanit Prameha* by classical sign and symptoms^[12]

The symptoms of *Sthula Prameha* can consider as Symptoms of *Sthalya (Medo dhatu vruddhi lakshan)* and *Prameha* symptoms, their feature as follow:

Sthula Prameha Parikshana

- *Prabhut mutrata* (Polyuria)
- *Avil mutrata* (Turbidity in urine)
- *Pipasa adhikya* (Polydypsia)
- *Kshuda adhika* (polyphagia/Increase in appetite)
- *Kar pada suptata* (Numbness in palm and foot)
- *Sweda adhikya* (Excessive perspiration)
- *Daurbalya* (Weakness)
- *Alasya* (General debility)
- *Sphik-stana lambanam*(extra fat on hip and breast region)
- *Shramam*(exhaustion)
- *Alpa chesta*(slow movement)
- *Shwasam*(breathlessness)
- *Sphik-stana lambanam*(extra fat on hip and breast

- region)
- *kasa*(cough)
- *Daurgandhya*(foul Smell)

According to sign and symptoms of *Prameha* was correlated with DM. So according to modern science criteria for Diagnosis of *Prameha*, By American Diabetic Association which is accepted by WHO was followed:

- Above Sign and Symptoms of *Prameha* plus
- Patients having random blood sugar level > 200 mg/dl.
- FBS > 126 mg/dl or
- PPBS > 200 mg/dl

Objective parameters

Blood Sugar level: Fasting and Post prandial

- HbA1c
- Urine examination –
 1. Routine examination
 2. Microscopic examination

Objective Parameter of Obesity

Obesity can be defined by these parameters -

Shukra Dhatu Parikshan

Table 1: *Shukra Kshaya Lakshana.*

Sr.No.	Lakshana	Questions	Yes/No
1.	Daurbalya	Do you feel moderate to severe weakness which makes the persons unable to perform routine work?	YES/NO
2.	Mukha Shosha	Any early ageing symptoms with dry skin and wrinkles on face and body are seen?	YES/NO
3.	Pandutvam	Where palloriness at skin and face could be observed?	YES/NO
4.	Shrama	Did you feel exhausted or getting tired easily even after little exertion?	YES/NO
5.	Sadan	Where severe bodyache requires medication?	YES/NO
6.	Mendra Vrishan Vedana	Did you feel pain at testes and penis?	YES/NO
7.	Maithun Ashakti	Did you feel your sexual stamina decreased?	YES/NO
8.	Klebya	Did you feel your sexual desire is decreased or lost?	YES/NO
9.	Alpa Shukra	Ejaculating little quantity of semen?	YES/NO
10.	Shukra Chirat Prasichyet	Did you feel difficulty in ejaculation of semen?	YES/NO

Table 2: *Shukra Vridhi Lakshan.*

Sr No.	Lakshana	Questions	Yes/No
1.	Ati Strikamata	Where increased excessive desire for sex?	YES/NO
2.	Shukrashmari	While ejaculating semen did you feel obstruction or any pain?	YES/NO

OBSERVATIONS AND RESULT

Table 3: Comparison of *Shukra Kshaya* symptoms in two groups Patients.

Symptoms	Group A		Group B		Test statistic
	N	%	N	%	
Daurbalya	16	53.33	04	13.3	Z=3.28 P<0.01
Mukha Shosha	06	20.00	02	6.67	Z=1.51 P>0.05
Pandutvam	00	00	00	00	-----
Shrama	10	20.0	06	20.00	Z=1.16 P>0.05
Sadan	08	26.67	04	13.33	Z=1.30 P>0.05
Medhra Vrishan Vedana	02	6.67	00	00	Z=1.44 P>0.05
Maithun Ashakti	18	60.00	00	00	Z=5.07 P<0.01
Klaibya	17	56.67	00	00	Z=4.87 P<0.01
Alpa Shukra	16	53.33	02	6.67	Z=3.94 P<0.01
Shukra Chirat Prasichyet	07	23.33	00	00	Z=2.81 P<0.01

- Lipid profile test
- BMI
- Skin fold thickness with caliper
- Waist hip ratio

Examination of following parameters of semen sample will be carried out as per the guidelines of W.H.O.

- Abstinence –
- Appearance –
- Volume (mL) –
- Viscosity –
- Reaction –
- Fructose –
- Sperm count (Millions/mL) –
- Sperm Morphology –
- Sperm Motility -

Ayurvedic Shukra Dhatu Panchabhautik Parikshan:

- *Sparsha*
- *Roopa (varna)*
- *Rasa*
- *Gandha*

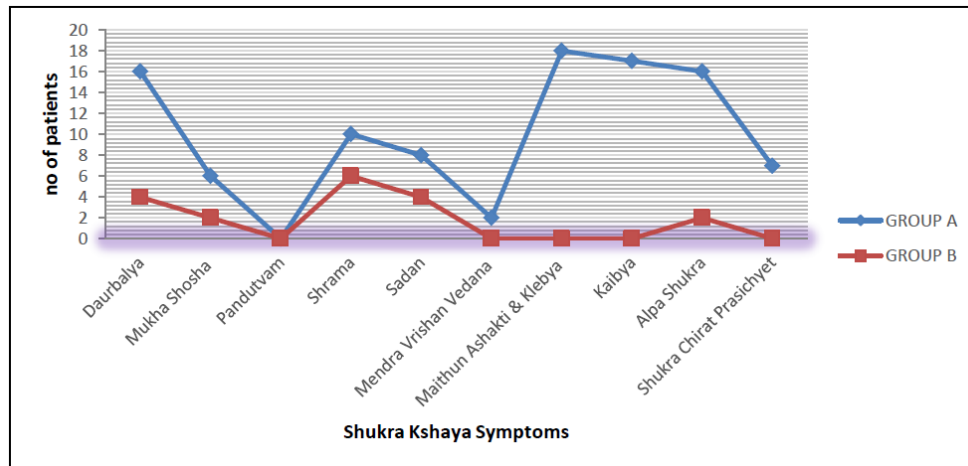


Figure 1: Comparison of Shukra Kshaya symptoms in two groups Patients.

On Comparison of Shukra Kshaya symptoms in two group patients, Significant difference observed in Maithun Ashakti, Klaibya, Daurbalya, Alpa Shukra and Shukra Chirat Prasichyet symptoms between two groups (P<0.05).

But no significant difference in Mukha Shosha, Pandutvam, Shrama, Sadan and Medhra Vrishan Vedana symptoms (P>0.05).

The present study in Group A, maximum number of patients i.e. 60.00% had Maithun Ashakti, 56.67% had Klaibya, 53.33% had Alpa Shukra and Daurbalya; 33.33% had Shrama; 26.67% had Sadan, 20% had Mukha Shosha and 6.70% had Medhra Vrishan Vedana. Where as in Group B, 20.00% had Shrama, 13.33% had Daurbalya and Sadan; 6.67% had Alpa Shukra and 3.33% had Mukha Shosha.

Table 4: Comparison of Shukra Vruddhi symptoms in two groups Patients.

Symptoms	Group A		Group B		Test statistic
	N	%	N	%	
Ati Strikamata	00	00	01	3.33	Z=-1.00 P>0.05
Shukrashmari	00	00	00	00	-----

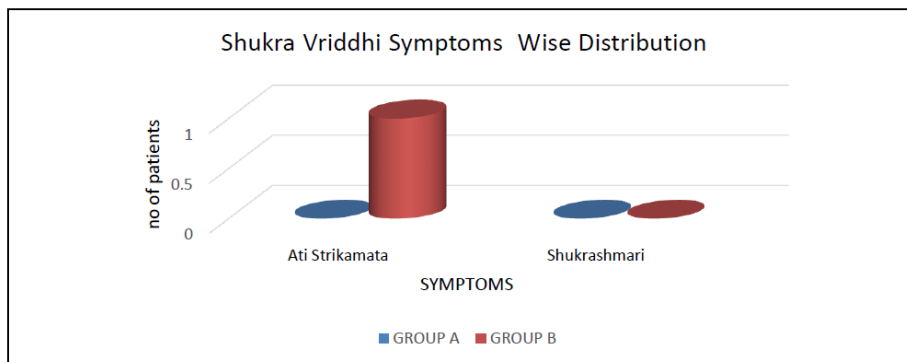


Figure 2: Comparison of Shukra Vriddhi symptoms in two groups Patients.

On Comparison of Shukra Vriddhi symptoms in two group patients, No significant difference observed in Ati Strikamata and Shukrashmari symptoms between two groups (P>0.05). In the present study, only in Group B 3.33% individual shows the symptom of Shukra Vriddhi as Ati Strikamata.

Statistical Analysis

This study was aimed to observe the Shukra dhatu in patients suffering from Sthaulyajanit Prameha (Type-2 Diabetes Mellitus). Semen analysis was done in two Groups in Group A individual with Diabetes and

individuals without Diabetes are in Group B.

H₀ – there is no vitiation in Shukra Dhatu in patients suffering from Sthaulyajanit Prameha (Type 2 DM). i.e H₀ is null hypothesis.

H₁ – there is vitiation in shukra dhatu in patients suffering from Sthaulyajanit Prameha (Type 2 DM). i.e H₁ is alternative hypothesis.

Further to find the vitiation of Shukra Dhatu between the two different groups Unpaired t test to the quantitative

data was applied.

Group A –group of individuals having Sthaulyanit Prameha (Type 2DM).

Group B – control group is of individuals without DM (Healthy individuals)

For every statistical analysis, significance level accepted at 5% at 95% confidence limit Degree of freedom – 58

The following observations and results were found.

Table 5: Overall result on different Semen Parameters.

Sr. No.		Group A (Mean ± SD)	Group B (Mean ± SD)	T	p Value	Interpretation
1.	Volume	2.203±0.3348	2.41±0.317696	2.453	0.01721	Significant
2.	Count	49.767±21.858	69.267±16.411	3.9076	0.0002	Significant
3.	Motility	48.333±12.820	57.333±6.396	3.4405	0.0011	Significant
4.	Morphology	45.833±9.476	51.333±11.9578	1.974	0.0531	Insignificant

Interpretation

There is significant difference in Semen parameters i.e. Volume, Count of Semen and Motility of Sperms in Group A than Group B. We should reject the null hypothesis H_0 and accept the alternate hypothesis H_1 i.e. there is significant vitiation in *Shukra Dhatu* between Group A (Individuals having *Sthaulyanit Prameha*) than Group B (Healthy individuals).

DISCUSSION

Sthaulyanit Prameha was elaborately discussed in classics of *Ayurveda* resembling with Type-2 Diabetes Mellitus associated with Obesity. *Prameha* is one of the most common complications of *Sthaulya*. *Medovaha Srotodusti Laksana* and the *Laksanas* which are also described as *Purvarupa* of *Prameha* can be considered as the *Purvarupa* of *Sthaulya*. *Prameha* is a *kulaja vikara* and occurs as result of *Beeja dosha*. *Shukra Dhatu* is responsible for reproduction. Therefore vitiation of *Shukra* leads to sex debility and impotency in the patient of *Prameha*. *Acharya Sushruta* has also mentioned that *Vyana* and *Apana* are the causative factors for *Shukra dosha* and *Prameha*. Whatever Obese persons take in food, it gets converted into *Meda* and thus the other next *Dhatu* i.e. *Majja*, *Shukra* remains undernourished leading to *Dhatukshaya*. Along with *Bahutva*, *Dhatvagnimandya* also results into *Abadhhatva* of *Meda*. Such *Abadhhatva Meda* gives *Shareera Shaithilya* and instead of doing *Asthi Poshana*; *Meda Dhatu* gets itself over nourished which is harmful to the body. Therefore vitiation of *Shukra* leads to sex disability and impotency in the patient of *Sthaulyanit Prameha*.

CONCLUSIONS

The Study entitled “Observational Cross-sectional Analytical Study of *Shukra dhatu* in *Sthaulyanit prameha* (Type-2 Diabetes Mellitus)” was undertaken for study. Following Conclusions are drawn- 1. Patients having Diabetes history for minimum 5 years shows maximum symptoms of *Shukrakshaya* than Non-diabetes individuals. About more than 60.00% patients of Obesity associated Type-2 DM found with *Maithun Ashakti* i.e. Loss of libido and decreased sexual desire. More than 53.30% patients of Obesity associated Type-2 DM (*Sthaulyanit Prameha*) found with *Alpa Shukra* i.e. less quantity of Semen. As the change regarding the Semen

volume, Sperm concentration and Sperm motility between Obesity associated Type-2 DM (*Sthaulyanit Prameha*) Patients with compared to Non- Diabetics (Healthy individuals) individuals is statistically Significant, so it is concluded that there is Significant reduction in semen parameters has been observed in the Diabetic patient group.

Our study indicated that *Shukra Dhatu* is significantly reduced both qualitatively plus quantitatively in *Sthaulyanit Prameha*. Furthermore, larger studies are needed to evaluate the causative mechanisms responsible for these changes as and possible treatment options.

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