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SHARIR KRIYATMAK (PHYSIOLOGICAL) STUDY OF *RASAVAHA SROTAS* AND ITS EFFECT W.S.R. TO *MADHUMEHA* – A NON INTERVENTIONAL RETROSPECTIVE CLINICAL STUDY

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ABSTRACT

Diabetes Mellitus defines a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both. It is one of the most common metabolic syndromes. Since there are 200 million diabetic individuals in the world, this creates a need to understand the etiology of the disease and the factor influencing its onset. In *Ayurveda* Diabetes Mellitus is correlated with *Prameha Vyadhi*. In *Prameha Vyadhi Acharya Charakacharya* mentioned *Mamsa*, *Rasa*, *Rakta*. *Majja*, *Shukra*, *Oja*, *Vasa*, *Lasika, Ambu* and *Sweda* are vitiating factors among them *Rasa Dhatu* is one.In *Prameha Vyadhi* there is *Dusti* of *Kapha Dosha*. *Acharya Ashtanghrudhaykar* said the properties of *Rasa Dhatu* & *Kapha* most of similar. The *Rasavaha srotas Dushti Lakshana like Hrullas*, *Angamard*, *Tandra*, *Alasya*, *Praseka*, *Gaurava* are found in Diabetes Mellitus. The formation of healthy *Rasa Dhatu* is depends upon *Rasavaha Srotas*. So it is decided to study *Rasavaha Srotas* in *Prameha Vyadhi* to know is there any relation between them.

KEYWORDS: *Madumeha, Rasavaha Srotas, Prameha, Dhatu, Dushti.*

INTRODUCTION

Ayurveda physiology is study of three major biological gears of living body, namely *Dosh*, *Dhatu*, *Mala*. They are three fundamental principle of human body. They together constitute living body each group has its own characteristics and has different role in the homeostasis of the body physiology as well as in the origination of diseases.

The formation and circulation of *Dosh*, *Dhatu*, *Mala* take place through *Srotas*. *Srotas* is unique concept in *Ayurveda*. *Srotas* are channel or pores in the body which provides nourishment to the whole body and responsible for some particular function with respect to body part. Major *Srotas* are thirteen as per *Charaka Samhita* and eleven pairs of *Srotas* as per *Sushrut Samhita*. All body entities get replenished in own *Srotas*. The *srotas* not only perform various functions but disturbance in *Srotas* may also impact some pathological manifestation, therefore it is very essential to understand physiological concept of *Srotas*. When well nourishment they grow better, If ill-nourished they get vitiated. When there is excess, deficiency or blockage in these channels disease can take place.

Rasavaha Srotas is one of them. *Rasavaha srotas* perform vital functioning of body related to circulatory process and physiological disturbance to their functioning may leads some pathological manifestation and if this *Srotas* not work properly then *Dhatus* nourishment not take place may result severe illness. The *Rasavaha Dhatuagni* is present in *Srotas* .Its important function is formation of *Rasa Dhatu*. The *Rasa Dhatu* is firstly formed *Dhatu* in all *Dhatu*, which carry nutrition to all *Dhatu*. If there is any *Dusti* of *Rasavaha Srotas* can lead *Vruddhi* or *kshaya* in *Rasa Dhatu* which causes the improper function of other *Dhatus*.

Madhumeha is diseases in which frequency of urine increases. *Acharya* have mentioned there is involvement of three *Doshas* and ten *Dusyas*. *Acharya Sushruta* mentioned it is *Ashtomahagadh Vyadi*. In *Prameha* there is mainly vitiation of *Meda Dhatu* take place. *Prameha* is correlated with Diabetes Mellitus in modern science.

AIM AND OBJECTIVE

The present study aimed at studying the *Rasavaha srotas* in patient suffering from *Madhumeha*. To acheive the objectives were, to review the assessment of *Rasavaha Srotas* w.s.r to *Madhumeha* and observe it.

4. MATERIAL AND METHODS
Material
- Classical sign and symptoms of *Madhumeha*.
- Classical *Lakshanas* of *Rasavaha Srotas* and *Rasa Dhatu Kshaya-Vridhi*.
- Investigation according to Ayurvedic and Modern parameters.

Methods
Male and female patients having classical signs and symptoms of *Madhumeha* were selected. The known cases of *Madhumeha* male and female patient were subjected for the study.

Plan of study
The study was carried out under two headings, viz. Conceptual study and Applied study.

A. Conceptual Study
In this study conceptual data and basic material collected from Ayurvedic classics as *Bruhattrayee Charak Samhita & Sushruta Samhita*, *Laghutryee* and other classics with available commentaries as well as various reference books to be reviewed.

Various Article, Publication and research papers, Text books have been referred to collect literary material. All these collected literary materials have been critically analyzed and also assessed and evaluated as per hypothesis and problem selected here. Related portion of the modern medical science has also been compiled and considered.

B. Applied Study
For this observational study the materials and methods include registration of the patients as per criteria of inclusion as well as exclusion. The special research proforma or case record form incorporating all required examinations and the investigation conducted with the use of Ayurvedic and modern techniques had made. For the present study, 30 diagnosed patients of *Madhumeha* (Diabetes) and 30 Non- Diabetic individuals had taken from the outdoor Patient Department and In-door Department of our Hospital. Patients were selected as per the inclusion and exclusion criteria. Patients were observed on the basis of classical sign and symptoms of *Madhumeha*, *Rasavha Srotas Dushti* and *Rasa Dhatu Kshaya-Vrudhhi Lakshanas*.

Sample Size: 60 Patients.
Group A: 30 Known cases of *Madhumeha* (Diabetes) patients.
Group B: 30 Non-Diabetes individuals.

A) Inclusive criteria
1. Age- patients between ages of 35 to 55 years.
2. Gender- Both male & female patients were selected on the basis of classical sign and symptoms of *Madhumeha*.
3. Patient diagnosed with *Madhumeha*.

4. All patients of Type 2 Diabetes mellitus (Noninsulin dependent).
5. Patients diagnosed with three years of *Madhumeha*.

B) Exclusive criteria
1. Patients having type 1 DM.
2. Age below 35 years & above 55 years.
3. Patients having any serious illness.
4. Complication with DM.
5. Excessive blood glucose FBS > 300 mg/dl

Investigations
- Blood Sugar: Fasting and post prandial
- Urine: Routine and Microscopic
- CBC
- Total Plasma protein
- ECG

Criteria of assessments
Criteria for Diagnosis of *Madhumeha* by classical sign & symptoms
1) Subjective Parameters
1. *Prabhutmutrata* (Polyuria)
2. *Avilmutrata* (Turbidity in urine)
3. *Pipasaadhikya* (Polydipsia)
4. *Kshudaadhika* (polyphagia \ Increase in appetite)
5. *Karpadasuptata* (Numbness in palm and foot)
6. *Swedaadhikya* (Excessive perspiration)
7. *Daurbalya* (Weakness)
8. *Alasya* (General debility)

According to sign and symptoms of *Madhumeha* is correlated with DM. So according to modern science criteria for Diagnosis of *Madhumeha*, by WHO is followed.
- Above Sign & Symptoms of Madhumeha
- Patients having random blood sugar level > 200 mg/dl.
- Fasting Blood Sugar> 126 mg/dl or
- Post Prandial Blood Sugar> 200 mg/dl

Objective Parameters

A. *Rasavaha Srotas Parikshan*

Sr.N			
1.	*Asraddha*	Did you have lack of desire for food at any time even after digestion of previous food?	Yes/No
2.	*Agninash*	Do you feel loss of appetite?	Yes/No
3	*Asyavairasya*	Did you feel wired tastes in mouth (sweet, bitter etc) ?	Yes/No
5	*Hrullasa*	Did you have nausea?	Yes/No
6	*Gaurava*	Do you feel heaviness in body?	Yes/No
7	*Tandra*	Do you feel loss of perception, heaviness of the body associated with yawning and weakness?	Yes/No
8	*Angamarda*	Do you feel painful sensation all over body?	Yes/No
9	*Jwara*	Do you have fever repeatedly without reason?	Yes/No
10	*Pandutwa*	Where pallorness at skin and face could be observed ?	Yes/No
11	*Srotorodha*	Is there swelling on body part?	Yes/No
12	*Saada*	Do you feel any of your body part is not functioning properly?	Yes/No
13	*Krushangta*	Has there been decreased in weight?	Yes/No
14	*Ayatha kala Valya*	Has there been early wrinkle on skin	Yes/No
15	*Ayatha kala Palita*	Is there early graying and fall of hair?	Yes/No

B. *Rasadhatu Vridhi Lakshana.*

Sr.N			
1	*Hrudyutkled*	Do you feel going to vomit?	Yes/No
2	*Praseka*	Do you have excessive salivation?	Yes/No
3	*Gaurava*	Do you have feeling of heaviness?	Yes/No
4	*Shaitya*	Do you feel uncomfortable on exposure to cold?	Yes/No
5	*Shwaityam*	Has your complexion become pale?	Yes/No
6	*Shwas*	Are you suffering from respiratory disorders causing breathing difficulty?	Yes/No
7	*Kasa*	Do you have cough repitadliy?	Yes/No
8	*Atinidrata*	Are you sleepy even after sleeping for adequate hours?	Yes/No
9	*Aalasya*	Do you feel lazy?	Yes/No

C. *Rasadhatu Kshaya Lakshana-*

Sr.N			
1	*Rukshata*	Do you feel dryness in body?	Yes/No
2	*Shrama*	Did you feel exhausted or getting tired easily even after little exertion?	Yes/No

OBSERVATIONS AND RESULT

Table no. 1 Comparison of *Srotas Pariksha* symptoms between DM group and Control group.

| Symptom	DM group (N=30)		Control group(N=30)		Test statistic	P value
	Yes	%	Yes	%		
Asraddha	20	66.7	0	0.0	Z=7.75	P<0.01**
Agninash	17	56.7	0	0.0	Z=6.26	P<0.01**
Asyarairasya	15	50.0	0	0.0	Z=5.48	P<0.01**
Hrullas	17	56.7	04	13.3	Z=3.95	P<0.01**
Gaurava	22	73.3	02	6.7	Z=7.19	P<0.01**
Tandra	14	46.7	03	10.0	Z=3.45	P<0.01**
Angmarda	19	63.3	05	16.7	Z=4.20	P<0.01**
Jwara	03	10.0	01	3.3	Z=1.04	P>0.05
Pandutwa	10	33.3	03	10.0	Z=2.29	P<0.01**
Srotorodha	01	3.3	01	3.3	0.00	--
Saada	03	10.0	0	0.0	Z=1.83	P<0.05*
Krushangata	01	3.3	01	3.3	0.00	--
Ayatha kala valya	07	23.3	02	6.7	Z=1.86	P<0.05*
Ayatha kala Palita	13	43.3	01	3.3	Z=4.16	P<0.01**
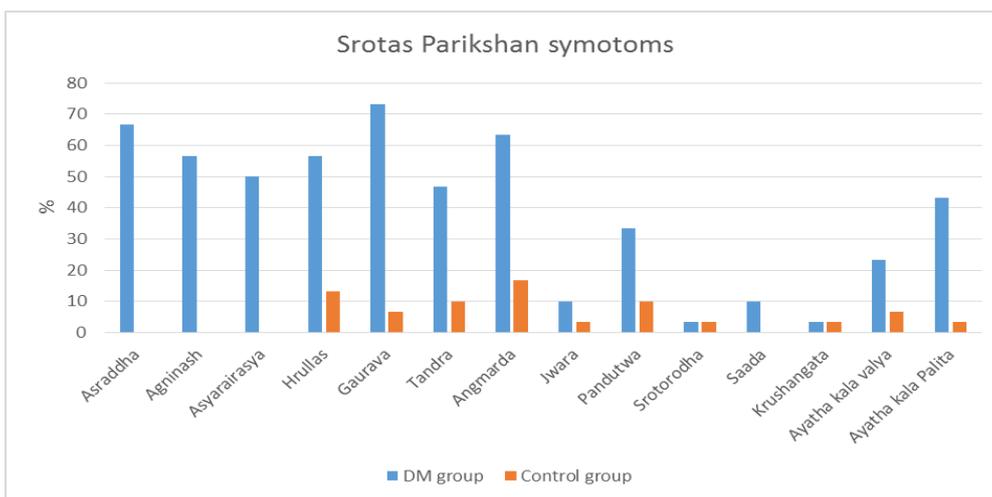
Figure no. 1: *Srotas Parikshan* Symotoms.

On comparison of *Srotas Parikshan* symptoms between DM group and Control group,symptoms *Asraddha*, *Agninash*, *Asvarairasya*, *Hrullas*, *Gaurava*, *Tandra*, *Angmarda*, *Pandutwa*, *Ayatha kala Palita* are found highly significantly more (P<0.01) in DM group than Control group while symptom *Saada* and *Avatha kala valve* are found significantly more in DM group as compare to Control group (P<0.05)

While symptoms *Jwara*, *Srotorodha*, *Krushangata*, were proportionally same in both group (P>0.05).

Table no. 2: Comparison of *Rasadhatu vruddhi* symptoms between DM group and Control group.

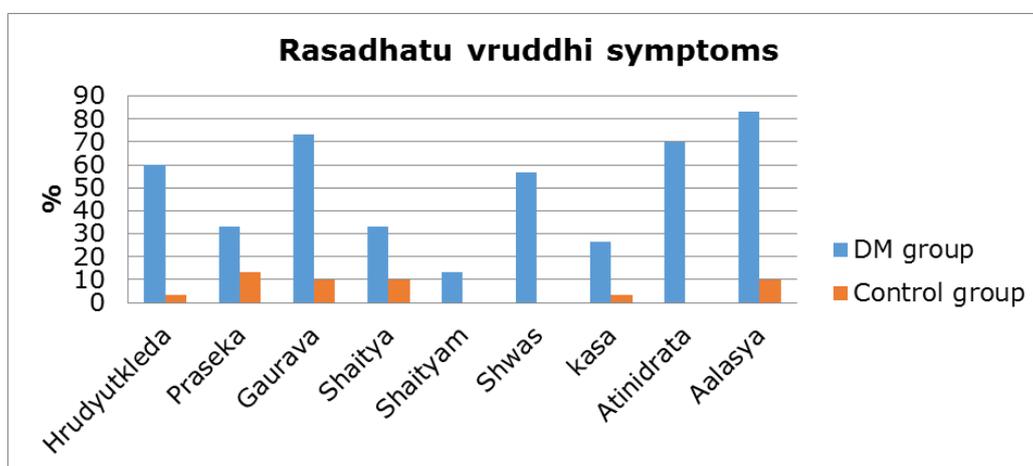| Symptom	DM group (N=30)		Control group(N=30)		Test statistic	P value
	Yes	%	Yes	%		
Hrudyutkleda	18	60.0	01	3.3	Z=5.95	P<0.01**
Praseka	10	33.3	04	13.3	Z=1.88	P<0.05*
Gaurava	22	73.3	03	10.0	Z=6.49	P<0.01**
Shaitya	10	33.3	03	10.0	Z=2.29	P<0.01**
Shaityam	04	13.3	0	0.0	Z=2.15	P<0.01**
Shwas	17	56.7	0	0.0	Z=6.26	P<0.01**
Kasa	08	26.7	01	3.3	Z=2.68	P<0.01**
Atinidrata	21	70.0	0	0.0	Z=8.37	P<0.01**
Aalasya	25	83.3	03	10.0	Z=8.40	P<0.01**

Figure no. 2: *Rasa Dhatu Vruddhi Lakshane*.

On comparison of *Rasadhatu vruddhi* symptoms between DM group and Control group , symptoms *Hrudyutkleda*, *Gaurava*, *Shaitya*, *Shaityam*, *Shwas*, *kasa*, *Atinidrata*, *Aalasya* are found highly significantly more (P<0.01) in DM group than Control group while symptom *Praseka* is found significantly more (P<0.05) in DM group than Control group.

Table no. 3: Comparison of *Rasadhatu Kshaya* symptoms between DM group and Control group.

Symptom	DM group (N=30)		Control group(N=30)		Test statistic	P value
	Yes	%	Yes	%		
Rukshata	0	0.0	04	13.3	Z=-2.15	P<0.01**
Shrama	06	20.0	01	3.3	Z=2.08	P<0.05*
Shoha	0	0.0	02	6.7	Z= -1.46	p>0.05
Glani	*0*	*0.0*	*1*	*3.3*	*Z= -1.02*	*p>0.05*
Shabdasahisnuta	0	0.0	0	0.0	--	--
Hrutapida	0	0.0	0	0.0	--	--
Shunyata	0	0.0	03	10.0	Z= -1.83	P<0.05*
Trushna	10	33.3	0	0.0	Z= 3.87	P<0.01**

** indicates highly significant, * indicates significant
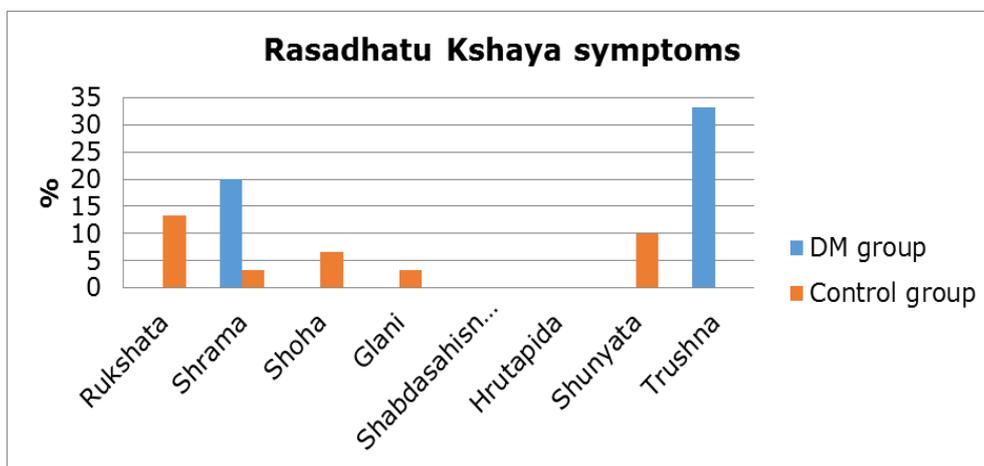
Figure no. 3: *Rasa Dhatu Kshaya Lakshane*.

On comparison of *Rasadhatu Kshaya* symptoms between DM group and Control group symptom *Rukshata* is observed highly significantly (P<0.01) less in DM group than Control group (P<0.01) and symptom *Trushna* is observed highly significantly (P<0.01) more in DM group than Control group .While symptoms *Shrama* are found significantly (p<0.05)more in DM group than Control group .Some symptoms like *Shoha*, *Glani*, *Shabdasahisnuta* and *Hrutapida* are found proportionally same in both group (P>0.05).

Table no. 4: Comparison of Total Plasma Protein value between DM and Control group.

	DM	Control
Mean	8.4	7.79
SD	0.7	0.84
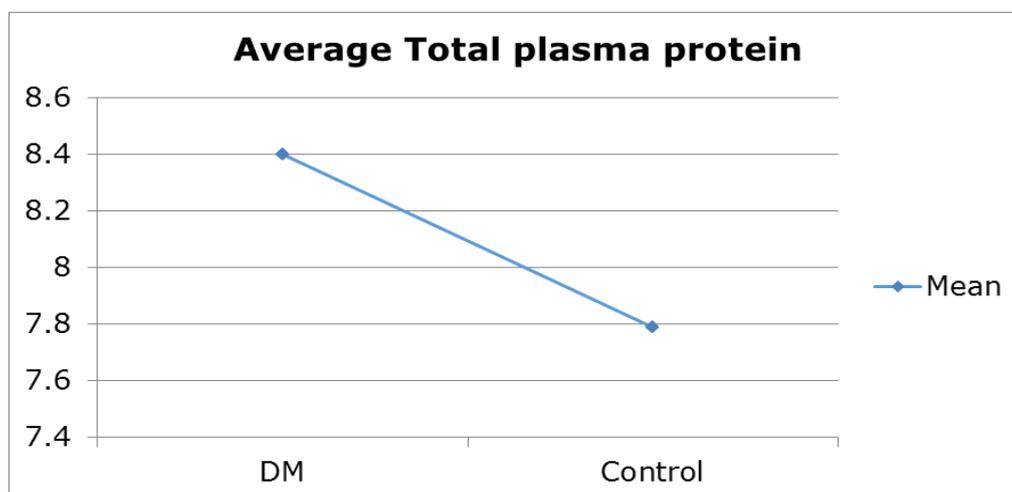
Figure no. 4: Total plasma volume.

Statistically Total Plasma Protein value is significantly higher in DM group respondent than Control group (t= 3.0,P<0.01).

Table no. 5: Comparison of ECG finding between DM and Control group.

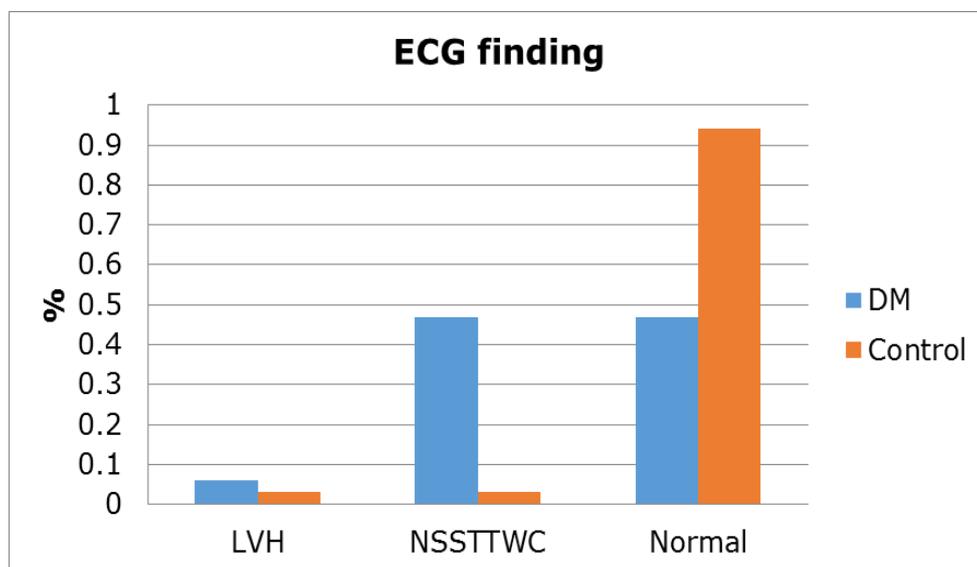|	DM group		Control group	
	N	**%**	**N**	**%**
LVH	02	0.06	01	0.03
NSSTTWC	14	0.47	01	0.03
N	14	0.47	28	0.94
Total	30	100	30	100

Figure no. 5: ECG finding.

There is significant difference between proportions of ECG finding between DM group and Control group (Chi-square test=16.26, DF=2,P<0.01).

Statistical Analysis
This study was aimed to study the *Rasavaha Srotas* and *Rasadhatu* in patient suffering from *Madhumeha*. *Rasavaha Srotas Dushti Lakshana*, *Rasa Dhatu Dushti Lakshana* examination, Plasma protein and ECG examination done in two Group in Group A individual with Diabetes and individuals without Diabetes are in Group B.

H_0 – there is no significant difference in the parameters of *Rasavaha Srotas* analysis at the end of the study between group A and group B.
i.e H_0 is null hypothesis

H_1- there is significant difference in the parameters of *Rasavaha Srotas* analysis at the end of the study between group A and group B.
i.e H_1 is alternative hypothesis

Further to find the vitiation of *Rasavaha Srotas* between the two different group z-test was applied.
Group A- group of individulas having Diabetes.
Group B- control group is of individuals without Diabetes.
For every statistical analysis, significance level accepted at 5% at 95% confidence limit.

Interpretation
There is significant difference in *Rasavaha Srotas* Parameters in Group A than Group B. We should reject the null hypothesis H_0 and accept the alternate hypothesis.

DISSCUSION
DISSCUSION OF *SROTASDUSHTI LAKSHAN*
In present study in group A maximum number of patient i.e 73.3% had *Gaurava*, 66.7% had *Asraddha*, 63.3% had *Angmarda*, 56.7% had *Hrullas*,and *Agninasha*, 50% had *Asyavairasya*, 46.7% had *Tandra*, 43.3% had *Ayatha kala Palita*, 33.3% had *Pandutwa*, 23.3% had *Ayathya Kala Valya*, 10% had *Saada* and *Jwara* and 3.3% had *Sotorodha* and *Krushangata*. These symptoms of *Rasavaha Srotas Dushti* seen. While in group B 16.7% had *Angmarda*, 13.3% had *Hrullas*, 10% had *Tandra* and *Pandutwa*, 6.7 had *Gaurva* and *Ayatha Kala Valya*, 3.3% had *Jwara*, *Srotorodha*, *Krushangta* and *Ayatha kala Palita* the symptoms *Asraddha*, *Agninasha*, *Asyavairasya* and *Saad* not found.

By applying test of proportion i.e Z test symptoms of *Srotas Parikshana* between DM group and Control group, symptoms *Asradhha*, *Agninasha*, *Asyavairasya*, *Hrullas*, *Gaurava*, *Tandra*, *Angmard*, *Pandutwa*, *Ayatha Kala Palita* are found highly significantly more (p<0.01) in DM group than control group while symptom *Saad* and *Avathya kala valya* are found more significant in DM group than control group (p<0.05). While symptoms *Jwara*, *Srotorodha Krushangata* are proportionally same

in both group (P> 0.05).

Srotas are important in manifestation of disease. If *Srotas* is in healthy state then formation of *Dosha*, *Dhatu* and *Mala* are good but when these *Srotas* get vitiated then *Dosha*, *Dhatu* and *Mala* also become vitiated. *Acharya Vagbhata* mentioned that *Ahara* and *Vihara* which aggravates the *Doshas* and which are having properties similar to *Dhatus* does the vitiation Of *Srotas*. In *Prameha Vydhi Acharya* mentioned 10 type of *Dushya* one of them is *Rasa Dhatu*. *Rasa Dhatu* is formed in *Rasavaha Srotasa*. In Ayurvedic text book *Aaharaj* and *Viharaj Nidana* mentioned for *Prameha* have similar property to *Rasavaha srotas Dushti Hetu* i.e the *Guru*, *Shingdh*, *Sheet.*

DISCUSSION ON *RASADHATU VRUDDHI*
In present study maximum no of patient i.e 83% had *Aalasya*, 73.3% had *Gaurva*, 70% had *Atinidrata*, 60% had *Hrudyutkleda*, 56.7% had *Shwas*, 33.3% had *Praseka* and *Shaitya*, 26.7% had *Kasa* and 13.3% had *Shaityam*. While in group B 13.3% had *Praseka*, 10% had *Gaurava*, *Shweta* and *Aalasya*, 3.3% had *Hrudyutkleda* and *Kasa* the symptoms *Shaityam*, *Kasa* and *Atinidrata* not found.

On comparison of *Rasadhatu Vruddhi* symptoms between DM group and control group by applying test of proportion i.e Z test the p value for symptoms *Aalasya*, *Gaurva*, *Atinidrata*, *Hrudyutkleda*, *Shwsa*, *Shaitya*, *Kasa* and *Shaityama* are found (P<0.01) highly significant in DM group than control group while symptom *Praseka* is found significantly more (P<0.05) in DM group than control group.

Acharyas mentioned 10 *Dusya* in *Madhumeha Rasa Dhatu* is one of them *Acharya Vagbhata* mentioned that *Raso Aapi Shlemwata* i.e the property of *Rasa Dhatu* and *Kapha Dosha* is similar. There is also *Ashrya- Ashryee* relation of *Kapha Dosha* and *Rasa Dhatu* i.e when *Kapha Dosha* increased *Rasa Dhatu* also increase. *Acharya Charaka* mentioned that *Bahu Dosha Kshesamavishesha* i.e in Prameha there is involvement of three *Doshas* but in which *Kapha Dosha* is mainly dominating and firstly get vitiated. *Guna* of *Kapha Dosha* and *Rasa Dhatu* are similar. So *Rasa Dhatu* get vitiated and causes *Rasa Dhatu Vruddhi.*

DISCUSSION *RASADHATU KSHAYA*
In present study group A maximum no. of patient i.e 33.3% had *Trushana* and 20% had *Shrama*. While in group B maximum patient had 13.3% had *Rukshta*. 10% had *Shunyata*. 6.7% had *Shosha*.3.3% had *Glani* and *Shrama*.

Comprising the symptoms of DM group and control group by applying test of proportion i.e Z test the symptom *Rukshata* is observed highly significant (P<0.01) in Control group than DM group and Symptom *Trushana* observed highly significant (P<0.01) in DM

group. While Symptom *Shrama* is observed significant (0.05) in DM group and symptom *Shunyata* is observed significant (0.05) in control group.

DISCUSSION ON PLASMA PROTIEN:
The analysis of values obtained from objective criteria of group A was done using Un-paired t-test one tailed as the data obtained was quantitative type. The objective values obtained was assessed by applying Un-paired t-test.

Mean plasma protein of group A patient having Diabetes was 8.4 and mean plasma protein of group B patients without Diabetes 7.79 which is statistically significant. It indicate that there is significant difference in plasma protein.

When Un-paired t-test was applied to observations i.e group A (Diabetic patient) and group B (Non-diabetic) it shows that value of t calculated is significant at P<0.01.

Thus, above statistics shown that there is significant variation in plasma protein.

DISCUSSION ON ECG FINDING
In present study group A ECG changes seen maximum no of patients i.e 0.47% had Non-Specific ST-T wave changes (NSSTTWC) and 0.06% had left ventricular hypertrophy (LVH). 0.47% had no any changes.

In group B maximum no patient i.e 0.94% had no any changes and 0.03% had NSSTTWC and LVH.

Diabetes Mellitus (DM) has been known for many years to be associated with poor cardiovascular diseases. After applying Chi-square test ECG changes seen in DM patient is NSSTTWC i.e non- specific ST-T wave changes.It indicate one of the most prevalent ECG abnormality in hypertensive patients. It represent that the true prevalence of hypertension is increases in DM population which is one of the major risk factor for the development of cardiovascular diseases such as stroke, ischemic heart diseases and heart failure, So DM can be generally considered as cardiovascular disease (CVD) because it causes both micro vascular and macro vascular complication.

In *Ayurveda* hypertension can be correlated with *Rasa Dhatu Vruddhi.*

PATHLOGICAL ASPECT OF *RASAVAHA SROTAS DUSHTI* AND *RASADUSTI* IN *MADHUMEHA*
रसोऽपि श्लेष्मवत् ।   अ.हृ.सु. ११.८

In *Madhumeha* there is vitiation of various *Dushyas* mentioned by *Acharyas* are *Rasa Rakta*, *Mamsa*, *Meda*, *Majja*, *Shukra*, *Kleda*, *Vasa*, *Lasika* and *Oja*. *Rasa Dhatu* is firstly formed *Dhatu* which provide nourishment to other *Dhatu*. According to *Ayurveda Srotas* are important for the production of *Dhatu*. *Dhatwagni* present in the *Srotas* is important for formation of *Dhatu Acharya*

Vagbhata said that *Rasadhatu* is like *Kapha Dosha* that means properties of *Rasa Dhatu* and *Kapha Dosha* are similar as *Prameha Hetu Sevan* increases *Kapha Dosha* i.e which also causes the *Rasavaha Srotas Dushti* and affect *Rasadhatwagni*. The vitiation of *Agni* causes the production of improper of *Rasa Dhatu* which is in the form of *Rasavridhi. Lakshna* of *Rasavruddhi are similar with Sleshma Vriddhi Lakshana*.They are as follows, *Agnisadana*, *Praseka* (increased salivation) *Aalsya* (laziness), *Gaurava* (heaviness), *Svaitya* (pallorness), *Saitya* (coldness), *Slthangata* (laxity of organ), *Svasa* (Dyspnoea), *Kasa* (Cough) and *Atinidrata* (excess of sleep) and vice- versa. *Rasavaha Srotas* get vitiated due to excessive intake of heavy, cold excessive unctuous food and over worry (*Rasavaha Strotodushti Karana*). Due to this food *Rasa Dhatu* get vitiated because in *Madhumeha* there is description of diet cause for *Madhumeha* which is *Sleshama Vardhak.*

CONCLUSION
Based upon the results of study displayed in the form of tables, graphs and carefully discussed in the previous chapter the following conclusion are drawn.

- Diabetes mellitus is seen in the middle aged people with sedentary life style and positive family history also matters in its development.

- *Rasavaha srotas Dhusti Lakshna* are seen more in Diabetic individuals as compare to Non-diabetic individuals i.e *Rasavaha stotas Dhusti* occur in *Madhumeha* patients.

- The patient having Diabetes history for minimum 4 year show *Rasa Dhatu Vruddhi Lakshana* like *Alasya*, *Atinidrata*, *Gaurava*, *Hrudayautkleda*, *Shawas*, *kasa*, *Praseka* etc are found more in Diabetes as compared to Non-diabetic individuals.

- As the difference regarding total plasma protein between Diabetic individuals which is compared with non-Diabetic individuals is statistically significant, so it is concluded that there is significant increase in plasma protein in the diabetic patient group.

- ECG changes seen in Diabetic individuals are Non-specific ST-T wave changes (NSSTTWC) which indicate that the hypertension prevalence is more in diabetic individuals Diabetes individuals compared to Non Diabetic individuals.

- So, consequentally the present study shows that there is definitive role of *Rasavaha Srotas Dushti* in *Madhumeha* patient.

- It indicated that *Rasavaha Srotas* gets vitiated in *Madhumeha*. As *Rasa Dhatu* formed in *Rasavaha Srotas*, also get vitiated in form of *Vruddhi*.

- Comapred with ECG changes there is relation of hypertention and diabetes found.
  From above data, the null hypothesis is rejected and alternate is accepted.

Further scope of study
1. Present study was conducted on limited number of subjects. Further study can be conducted with large population with different advanced technique.
2. To study of *Rasavaha Srotas* in *Madhumeha* will help to acess vitiated *Rasa Dhatu* in the body. It will help in the management of *Madhumeha Rasavaha Srotas* also get vitiated in patients and indirectly treats *Rasa Dhatu Vruddhi* with help of medicine.
3. A more controlled and standardized study of *Rasavaha Srotas* and *Madhumeha* is required to study their association more correctly.

Limitation
1. There are many other causes for vitiation of *Rasavaha Srotas*, they must be eliminated to obtain unbiased results.
2. This study has been done with very small sample size, so there may be variation with large sample.
3. As this study is observational, research does not have the benefit of randomization to allocate by chance risk factor for an outcome of interest.
4. *Srotas* examination is an art. Also it requires keen observation and good communication skill or more practice. Also require enough time to spend with patient. But in this study *Srotas Parikshan* questonare was used for determination of *Srotas Dushti*.

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