



ROLE OF *MEDO DHATU VRUDDHI* IN *MADHUMEHA* (DIABETES MELLITUS) – A NON INTERVENTIONAL CROSS SECTIONAL CLINICAL STUDY

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ABSTRACT

Madhumeha (Diabetes Mellitus) is highly prevalent disease of modern era. Vitiating of *Medo dhatu* is common dominant *dushya* in its pathogenesis. As it is a lifestyle disorder it can certainly be prevented by prompt understanding the role of *Medo vruddhi* in pathogenesis. The present scientific write-up is based on an effort of assessing the *Medo dhatu dushti* in 50 subjects who are diagnosed with *Madhumeha* (Type 2 Diabetes Mellitus) age between 30 years to 65 years and also fulfills the diagnostic criteria of Diabetes Mellitus by American Diabetic Association, accepted by WHO. *Medo dhatu dushti* is in close relation with hyperlipidemia and obesity from modern science of

medicine. The objective parameters undertaken for assessing hyperlipidemia were waist hip ratio, skin fold thickness with caliper, BMI and lipid profile test. The parallel objective criteria for assessing *Medo dhatu* were *sphika-stana lambanam* (sagging of butts and breasts), *shramam* (exhaustion), *daurgandhya* (foul smelling of body), *kasa* (cough), *shwasa* (dyspnoea), *udar-parshva vruddhi* (sagging of abdomen), *snigdghata* (unctuousness of body). Observations of this non-interventional single blind cross sectional clinical study showed that out of 50 patients 43 patients did presented with the symptoms of *Medo dhatu dushti* and 100 % vitiating of *Medovaha srotas*. Thus it can be concluded that as there is

definite role of *Medo dhatu dushti* in *Madhumeha* management of this disorder should be certainly concentrated over reducing vitiation of *Medo dhatu* which will eventually reduce the prevalence rate of Diabetes.

KEYWORDS: Madhumeha, Medo Dhatu vriddhi, Type-2 Diabetes Mellitus, Hyperlipidemia, Skin fold Thickness, Udara-Parshva Vriddhi.

INTRODUCTION

Type 2 diabetes mellitus is a lifestyle disorder which is affecting more than 143 million people all over the world currently^[1] and in a developing country like India it is the commonest disorder of the century.^[2] With all the latest advances in pharmacotherapeutics of anti-diabetic drugs the central pathology of 'insulin resistance' is still not under the control. Thus alternative medicinal therapies were searched and analyzed by scientists like Ayurveda which states *Madhumeha* as a parallel entity to Type 2 Diabetes Mellitus because there are some definite similarities between them. *Nidana* (etiological factors), *Samprapti* (pathogenesis), *Rupa* (signs & symptoms), *Bheda* (classification), *Upadrava* (complications) are some of the similar key points between two diseases. However there are some such points too which differ in the descriptions of *Madhumeha* and Type 2 diabetes mellitus. The literary review was obtained from *Laghutrayi*, *Brihatrayi*, *Bhel samhita*, *Haarit samhita*, various commentaries over above compendia. *Charaka Samhita* has narrated scientific study on *Medodhatu in Chikitsa Sthana*.^[4] He has illustrated *Medodhatu vriddhi Kshaya Lakshana* in *Chikitsa Sthana* and *Sutra Sthana*.^[5] Physiological measure is described in *Charak Sharira Sthana*.^[6] Under the caption of pathogenesis of *Medo Vriddhi*, *Samprapti*, *Snigdha Ahara* is mentioned as root cause of all illness due to flabbiness of body and excessive accumulation of *Meda*.^[7]

Madhumeha is mentioned among the 20 types of *Prameha* in Ayurvedic texts. The name *Prameha* is self-explanatory which means '*Prabhuta Mutrata*' (excessive urination) and '*Avil Mutrata*' (turbid urination). Incidentally the term diabetes has been derived from the Greek term 'Diabainein' that means 'to cross through a siphon' meaning continuous free flow of the water and applied to mean elimination of large quantity of Urine. Thus the terms '*Prameha*' and 'Diabetes' have similar meaning.

Madhumeha is a disease in which patient passes the large quantity of *Kashaya* (astringent), *Madhura* (sweet), *Ruksha* (dry) and *Pandu* (greyish and white) urine similar to the characters

of *Madhu* (honey) and the body too attains sweetness. The term *Madhumeha* is composed of two words i.e. "*Madhu*" and "*Meha*". The word "*Madhu*" is specially used here for showing its similarity in respect of colour, taste, etc. like *Madhu*. Interestingly enough the terms mellitus from the Latin meaning "sweetened with honey" so, diabetes mellitus refers passing the large quantity of sweet urine. Thus it can be seen here, that terms '*Prameha*' and '*Diabetes*' are synonymous and terms '*Madhumeha*' and Diabetes Mellitus have similar meaning. Also in the view of etiology, classification, pathogenesis, sign and symptoms, complications etc., *Madhumeha* has been correlated with Diabetes Mellitus. *Acharya Madhava* has elaborated the pathophysiology of *Medodhatu Vruddhi* on the basis of fat tissue and fat depot site and also mentioned natural tendency towards android obesity and hyperlipidemia.^[8]

The review was also taken from the research work done previously related to the topics such as dietary fact intake and risk of type-2 diabetes in women^[9], Analysis of lipids and lipoproteins in diabetic patients^[10], *Medo dhatu vruddhi* and *Madhumeha*, association of type-2 diabetes and *Madhumeha*, Obesity etc. These reviews were certainly helpful for formation of the concept regarding *Medo dhatu vitiation*. Basically *Medo dhatu vitiation* is the umbrella term which includes parallel entities such as obesity and hyperlipidemia.

Vitiation and excessive accumulation of *Meda Dhatu* is the initiative pathology of *Madhumeha* (Diabetes Mellitus).^[3] The *Medo dhatu vruddhi* is the one of the etiological factor which stands out of some other dissimilarity. The pathogenesis of Type 2 diabetes mellitus is not only a mere insulin resistance but it might be the manifestation of underlying hyperlipidemia. Thus with this hypothesis a non interventional, single blind, cross sectional study was carried out over 50 subjects attending the outpatient from Government Ayurvedic Hospital, Osmanabad. It evaluated the degree to which the *Medo dhatu* has interfered with the pathogenesis of *Madhumeha*.

AIMS AND OBJECTIVES

The present study was aimed at studying the role of *Medo dhatu vruddhi* in *Madhumeha* (Diabetes Mellitus). To achieve the aim the objectives set were, to review the concept of *Medo dhatu Vruddhi*, detailed review of type 2 diabetes mellitus, literary review of the concept of *Madhumeha* and assessment of *Medo dhatu Vruddhi* on *Madhumehi* subjects by means of clinical study.

MATERIALS AND METHODS

The research design opted for study was of non interventional single blind cross sectional one. The study was carried out over 50 subjects selected as per inclusion and exclusion criteria.

Inclusive criteria

1. Patients of positive blood sugar, positive urine sugar etc. of either sex was selected on the basis of classical signs and symptoms of Madhumeha.
2. Patient between ages 30 - 65 years.

Exclusive criteria-

1. Patients with juvenile diabetes.
2. Age of patient less than 30 years and more than 65 years.
3. Emergency cases in diabetes mellitus.
4. Patients having IDDM and receiving insulin (type 1)
5. Excessive blood glucose (FBS) > 300 mg/dl.
6. Chronic complications (micro vascular and Macro vascular) are discarded.
7. Patients with drug induced obesity and neuroendocrine disorder.
8. Genetic syndrome

Criteria of Assessment: Criteria for Diagnosis of Diabetes Mellitus by American Diabetic Association, which is accepted by WHO

- Patients having random blood sugar level > 200 mg/dl or
 - Fasting blood sugar (FBS) > 126 mg/dl or
 - Postprandial blood sugar (PPBS) > 200 mg/dl up to 500 mg/dl.
 - HbA1c > 6.5%
 - Urine examination
1. Routine examination
 2. Microscopic examination and Sign and symptoms of Diabetes Mellitus are as
 - Frequent urination
 - Excessive thirst
 - Extreme hunger
 - Unusual weight loss
 - Increased fatigue
 - Irritability

- Blurry vision

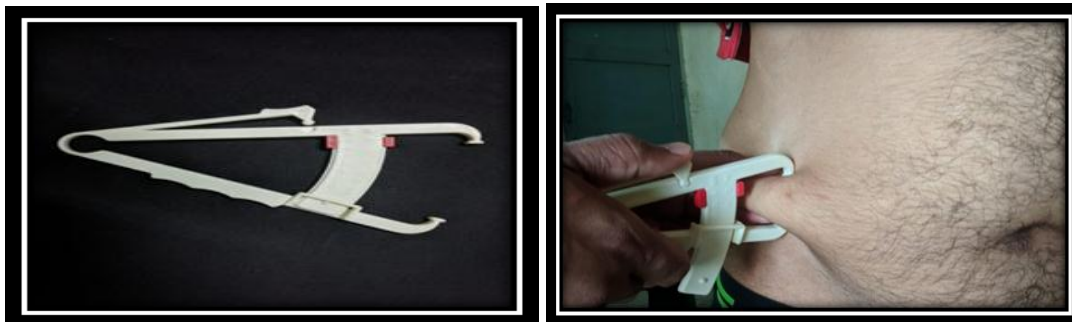
Objective Parameters of *MedoDhatuVruddhi*

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

Medodhatu Vruddhi Parikshana

- *Snigdhatata*(Unctuousness of body)
- *Udar-parshvavruddhi* (sagging of abdomen)
- *Shwasa*(Dyspnoea)
- *Kasa*(Cough)
- *Daurgandhya*(Foul smelling of body)
- *Shramam*(Exhaustion)
- *Sphika-stanalambanam*(sagging of butts & breasts)

Some figures of the instruments are being attached here, which are used while examined the patients regarding this research work. These are as below.



1. Skin Fold Thickness Caliper. 2. Measuring the skin fold thickness.

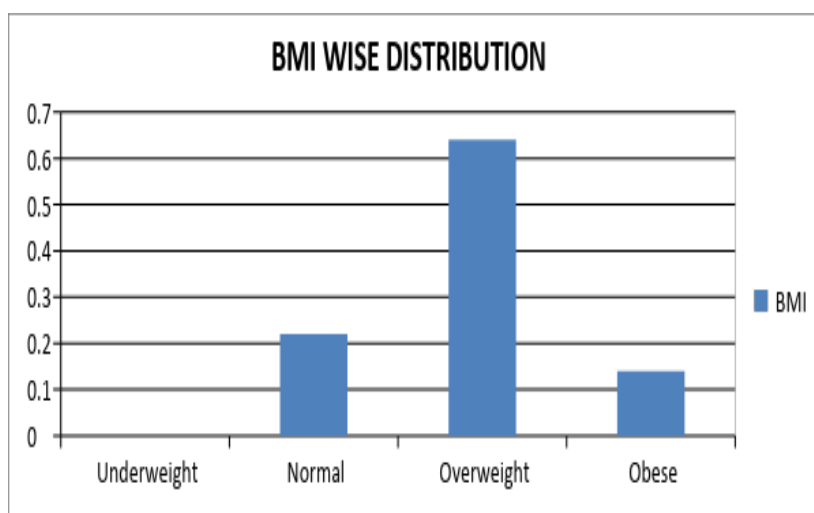


3. Measuring of Waist Circumference.

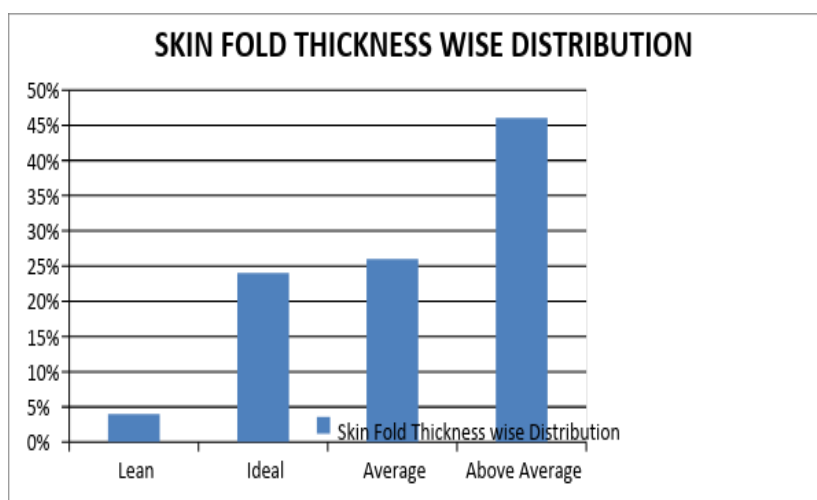
OBSERVATION AND RESULTS**Table. 1: Lipid profile readings in 50 sample size.**

Lipid profile	Mean Value
Serum Cholesterol	228.24
Triglycerides	192.4
High density lipoprotein (HDL)	41.44
Low density lipoprotein (LDL)	149
Very low density lipoprotein (VLDL)	38.66

Above data reveals that out of 50 diabetic patients average value of serum cholesterol was 228.24, average triglycerides value was 192, and average value of HDL, LDL and VLDL were 41.44, 149 and 38.66 respectively.

**Figure No. 1: Body built (BMI) wise distribution.**

There was no any patient in underweight, 11 patients (22%) were in normal weight, 32 patients (64%) had overweight and 7 patients (14%) were obese.

**Figure No. 2: Skin fold thickness wise distribution.**

Above data reveals that while measuring with caliper 2 patients (4%) were lean, 12 (24%) were ideal, 13 (26%) were average and maximum 23(46%) were above average.

Table. 2: Biochemical investigations in 50 patients in respect to Type-2 Diabetes Mellitus.

Biochemical investigations	Mean Value
Fasting blood sugar (FBS)	124.1
Post prandial blood sugar (PPBS)	265.6
Glycated Haemoglobin (HbA1c)	7.71

Above data reveals that average Fasting blood sugar was 124.1, average post prandial blood sugar was 265.6 and average glycated haemoglobin was 7.71 in 50 diabetic patients.

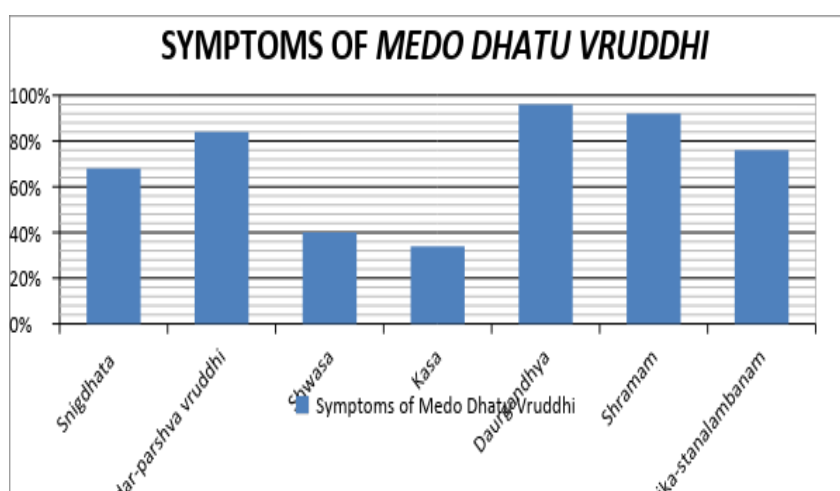


Figure No. 3: Symptoms wise distribution of Medo Dhatu Vrudhi in 50 diabetic patients.

Above data reveals that *Daurgandya* is found in maximum patients of diabetes i.e. 96% followed by *Snigdhatra*, *Udarparshva vrudhi*, *Shwasa*, *Kasa*, *Shramam* and *Sphik stanalambanam* are found in 68%, 84%, 40%, 34%, 92% and 76% patients respectively.

RESULTS

The information gathered on the basis of above observations was subjected to statistical analysis with the help of Fisher exact test.

The obtained results were interpreted as

- Insignificant - $P > 0.05$.
- Significant - $P < 0.05$.
- Highly Significant - $P < 0.01$.

Table No. 3: Association between Symptoms of *Madhumeha* and Symptoms of *Medo dhatu vruddhi*.

Symptoms of <i>Medo dhatu vruddhi</i>	Symptoms of <i>Madhumeha</i>		Total
	Present	Absent	
Present	40	3	43
Absent	5	2	7
Total	45	5	50

DISCUSSION

The cross sectional study of 50 patients with type -2 Diabetes mellitus certainly revealed the key facts regarding the correlation of *Madhumeha* and *Medo Dhatu* vitiation. This vitiation of *Medo Dhatu* has been measured in terms of subjective criteria (assessing signs and symptoms of *Medo Dhatu Dushti*) and by assessing obesity related indices.

Obesity is the major cause of hyperlipidaemia in Indian population.^[11] It is measured either as body-mass index, or waist-hip ratio. Obese subjects on average have the higher Blood Pressure, higher serum total cholesterol, lower High Density Lipoprotein, higher serum triglycerides, higher blood glucose and a higher plasma insulin levels than lean persons.^[12] It poses risk of one of the components of metabolic syndrome and is also strongly associated with type 2 diabetes mellitus, which itself poses a significant risk for the high cholesterol levels and the heart disorders.^[13]

- **Association between Symptoms of *Madhumeha* and Symptoms of *Medo dhatu vruddhi***

About 90% of *Madhumehi* patients (true positive) were having *Medo dhatu vruddhi* but 10% of the patients (false negative) had not symptoms of *Medo dhatu vruddhi*.

So consequentially it can be interpreted that about 90% of the *Madhumehi* (diabetic) patients were correctly identified with *Medo Dhatu vruddhi*.

Meda vitiation is common and dominant *Dushya* in the pathogenesis of *Madhumeha*. Both quantitatively and qualitatively *Meda* is vitiated. According to Ayurvedic texts vitiation and excessive accumulation of *Meda Dhatu* or *Medo Dhatu Vruddhi* is the major pathology of *Madhumeha*.

- **Waist to Hip ratio:** The waist-hip ratio (WHR) greater than 0.9 for men and greater than 0.85 for women indicates the abdominal obesity. It was (81.8%) in male patients and (45.45%) in female patients in the current study.

Circumference and waist to hip ratio are both taken as measures of the central obesity which is related to both insulin resistance and type 2 Diabetes Mellitus. Waist to hip ratio is also an important determinant of the hypercholesterolaemia, low HDL and hypertriglyceridemia. Waist Abdominal obesity is characterized by the increased visceral fat which is functionally different from the subcutaneous fat and results conducive to the dyslipidaemia.^[14]

• Biochemical investigations

Most of the patients were with the marginal high blood sugar levels or not fully controlled by the modern medications. These parameters like fasting blood Sugar levels, Post Prandial Blood Sugar Levels, Glycosylated Hb and Lipid profile, can be taken as *Rasa-raktagata Sneha indicators*. There was a marginal increase of cholesterol, Serum triglyceride was also found increased in most of the patients. As levels of cholesterol rises the risk for developing metabolic disorders and coronary heart disease increases.^[15]

Thus all the above parameters are suggestive of significant *Medo Dhatu Vruddhi* which is a potential risk factor in pathogenesis of *Madhumeha*.

CONCLUSION

- The present research work was aimed to explore the role of *Medo Dhatu Vruddhi* in *Mahumeha* (Diabetes Mellitus). Vitiating of *Medo Dhatu* is common and dominant *Dushya* in the pathogenesis of *Madhumeha*. *Meda* is vitiating both quantitatively and qualitatively.
- In Present study maximum i.e. 90% of the *Madhumeha* (Diabetic) patients were showed the cause as *Medo Dhatu vruddhi* but 10% of the patients had no symptoms of *Medo dhatu vruddhi*.
- Many lipoprotein abnormalities have been seen in the patients with type 2 diabetes. Serum Cholesterol, triglyceride and LDL were found increased in most of the diabetic patients in this study. In lipid profile cholesterol, triglycerides, LDL and HDL were found in strong relationship with HbA1c but VLDL showed no significant association with HbA1c.
- Significant association was also found between Skin fold thickness value and BMI with HbA1c.
- Thus it can be concluded that there is strong relation between *Medo dhatu vruddhi* and *Madhumeha* which must be certainly kept in mind while dealing with the patient of *Madhumeha*.

➤ Larger population of patients for further detailed observational study will be necessary to fully explain and confirm the results obtained in the present study.

REFERENCES AND BIBLIOGRAPHY

1. Michio Shimabukuro et al., Fatty acid induced Beta cell apoptosis: A link between obesity and diabetes, Proc. Natl. Acad. Sci. USA, March 1998; 95: 2498-2502.
2. Adilson Guilherme et al., Adipocyte dysfunctions linking obesity to insulin resistance and type 2 diabetes, Nat Rev Mol cell Bil., May 2008; 9(5): 367-377.doi:10.1038/nm2391
3. Acharya Vidhyadhar Shukla and Prof. Ravidatta Tripathi. Charak Samhita, Vol. 1, Delhi; Chaukhamba Sanskrit Pratishthan, 2013; (Sutra 17/79): 267.
4. Acharya Vidhyadhar Shukla and Prof. Ravidatta Tripathi. Charak Samhita, Vol. 2, Delhi; Chaukhamba Sanskrit Pratishthan, 2013; (Chikitsa 15/28): 366.
5. Acharya Vidhyadhar Shukla and Prof. Ravidatta Tripathi. Charak Samhita, Vol. 1, Delhi; Chaukhamba Sanskrit Pratishthan, 2013; (Sutra 17/66): 265.
6. Acharya Vidhyadhar Shukla and Prof. Ravidatta Tripathi. Charak Samhita, Vol. 1, Delhi; Chaukhamba Sanskrit Pratishthan, 2013; (Sharira 7/15): 769.
7. Acharya Vidhyadhar Shukla and Prof. Ravidatta Tripathi. Charak Samhita, Vol. 2, Delhi; Chaukhamba Sanskrit Pratishthan, 2013; (Sutra 21/5-6): 301.
8. Ayurvedacharya Shri Yadunandanopdhyaya. Madhav Nidanam, Vol. 2. Varanasi, Chaukhamba Sanskrit Sansthan, 2002; (34/4): 28.
9. Seyoum B et al.,, Analysis of serum lipids and lipoproteins in Ethiopian diabetic patients, Ethiop Med J., 2003 Jan; 41(1): 1-8.
10. Jorge Salmeron et al., Dietary fat intake and risk of type 2 diabetes in women, Am J Nutr, 2001; 73: 1019-26.
11. Barbara b. Kahn and Jefferey S. Flier, Obesity and insulin resistance, The Journal of Clinical Investigation, August 2000; 106(4).
12. Adilson Guilherme et al., Adipocyte dysfunctions linking obesity to insulin resistance and type 2 diabetes, Nat Rev Mol cell Bil., May 2008; 9(5): 367-377.doi:10.1038/nm2391.
13. Michio Shimabukuro et al., Fatty acid induced Beta cell apoptosis: A link between obesity and diabetes, Proc. Natl. Acad. Sci. USA, March 1998; 95: 2498-2502.
14. Gyaneshwar Singh et al., Role of diet and life Style in the management of Madhumeha (Diabetes Mellitus), AYU. July 31, 2014, IP: 42.104.3.174.
15. Smriti Pandey et al., A study of Medo dhatu and its effect on the clinical case of Sthaulya (Obesity), Adv. Biores, Dec., 2010; 1(2).