



THE COMPARATIVE STUDY ON KATAK KHADIRADI KASHYAYAM AND NIRURYADI GULIKA IN THE MANAGEMENT OF MADHUMEHA W.S.R.TO HYPERGLYCEMIA

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ABSTRACT

Madhumeha, described as a subtype of Prameha in Ayurvedic classics, can be clinically correlated with Diabetes Mellitus, a chronic metabolic disorder characterized by persistent hyperglycaemia due to insulin deficiency or resistance. The present clinical study was undertaken to evaluate and compare the antihyperglycaemic effect of Katak Khadiradi Kashyayam and Niruryadi Gulika in the management of Madhumeha. A total of 40 clinically diagnosed patients of Madhumeha were selected from the OPD and IPD of the P.G. Department of Kayachikitsa, National Institute of Ayurveda, Jaipur, out of which 30 patients completed the clinical trial. The selected patients were randomly divided into three groups: Group I received Katak Khadiradi Kashyayam, Group II received Niruryadi Gulika, and Group III received a combination of both drugs for a duration of 30 days. Assessment was carried out based on subjective parameters such as Prabhoota Mutrata (polyuria), Klama (fatigue), Alasya (lassitude), Vibandha (constipation), Mukhashosha (dryness of mouth), and objective parameters including Fasting Blood Sugar (FBS) and Postprandial Blood Sugar (PPBS). The results revealed statistically significant improvement in both subjective and objective parameters in all three groups, with highly significant reduction observed in Group III receiving combination therapy. The study indicates that Katak Khadiradi Kashyayam and Niruryadi Gulika are effective in the management of Madhumeha, with better outcomes when administered in combination.

KEYWORDS

Madhumeha, Diabetes Mellitus, Prameha, Hyperglycaemia, Katak Khadiradi Kashyayam, Niruryadi Gulika, Ayurvedic Management, Antihyperglycaemic Effect, Fasting Blood Sugar, Postprandial Blood Sugar

INTRODUCTION:-

According to pathogenesis and clinical manifestation, Diabetes mellitus can be easily correlated with *madhumeha*. *Madumeha* is being described under the subtype of *vataja prameha*. It has been broadly elaborated in main ancient *Ayurveda* texts like *Brihatraye* and *Laghutraye*. Considering the seriousness of the condition and its prognosis, it is being too referred to *Mahagada* or *Maharoga*.

A Diabetes Mellitus, the most common endocrine disorder and a clinical syndrome characterized by hyperglycaemia due to relative or absolute deficiency of insulin resulting in long standing metabolic derangements associated with pathophysiological changes in multiple organ system of eyes, kidneys, nerves and vascular system being characteristically susceptible.

The W.H.O. estimates that mortality from diabetes and heart disease cost India about \$120 billion every year and is expected to increase to \$335 billion in the next ten years. These estimates are based on lost productivity, resulting primarily from premature death.

Diabetes mellitus is a growing health hazard in developing countries. As a psychosomatic disease and due to most dangerous complications, diabetes mellitus has grabbed the attention of health community all over the world. Globally, diabetes affects 246 million people, which is about 6% in the total adult population .It is the 4th leading cause of death by disease and every 10 sec a person dies from diabetes related causes in the world. The Top ten countries, in numbers of sufferers, are India, China, USA, Russian Federation, Brazil, Germany, Pakistan, Japan, Indonesia and Mexico.

AIM AND OBJECTIVES

The present research trial has been undertaken with the following main objectives-

- Conceptual and clinical studies on *Mudhumeha* W.S.R. to Hyperglycemia and its management with time tested *Ayurvedic* principles.
- To evaluate Antihyperglycemic effects of the *Katak Khadiradi Kashyayam* (*Sahasra Yogam* ,CCRAS publication, *pratham prakaran – kashyaya yog* 71, page no.16) and *Niruryadi Gulika*(*Sahasra Yogam* ,CCRAS publication, *duvitiya prakaran – gutika yoga* 69, page no.142) in a series of patients suffering from *Madhumeha* on various scientific parameters.
- To compare the efficacy of Antihyperglycemic effects of the *Katak Khadiradi Kashyayam* and *Niruryadi Gulika*.

MATERIALS AND METHODS

Following materials and methods were adopted for conducting the present clinical trial:

1. SELECTION OF CASES

The study recruited a population of 40 clinically diagnosed patients of *Madhumeha*(hyperglycemic) selected from O.P.D. / I.P.D. unit of P.G. Department of *Kayachikitsa*, National Institute of Ayurveda, Jaipur and *Seth Surajmal Bombewala Hospital, Kishanpole Bazar, Jaipur* . Out of which 30 patients has been completed clinical trial and 10 patients was drop out during the trial period. A regular record of the assessment of all patients was maintained according to proforma prepared for the purpose.

Following inclusion and exclusion criteria's were used for registration of the patients for present clinical trial.

(a) INCLUSION CRITERIAS

- Patient with clinical history of DM.
- Patient having hyperglycaemia confirmed by laboratory investigation.

(b) Presence of Cardinal symptoms of *Madhumeha* as described in *Ayurveda* texts.EXCLUSION CRITERIAS

- Patient having Type 1 DM.
- Age below 20 and above 70 years.
- Patient of Type II DM who were on insulin therapy.
- Complication with DM.
- Patient having any serious illness.
- Patient having a FBS >250 AND PPBS >300.

2. SELECTION OF DRUGS

Taking the symptoms and the *Samprapti* of *Madhumeha* into consideration, a “*Katak Khadiradi Kashyayam* and *Niruryadi Gulika*” has been selected. The drug selected for the study a *Katak Khadiradi Kashyayam* were mainly having *Tikta, Katu, Kashaya rasa, Katu Vipaka, Laghu, Ruksha & Tikshna Guna pradhana aoshdhi* . All the selected drugs were having *Mutrasagrahaniya, Jatharagni vardhak, vayasthapana, chakshushya, rasayan, vrishya, grahi, lekhana, deepana, oja vardhana and pachana*.

Table no. I:-

Showing the Contents of “*Katak Khadiradi Kashyayam*”.

S.No.	Drugs	Botanical study	Part use	Quantity
1.	<i>Katak</i>	<i>Strychnous potatorum</i>	Seed	1.852 gm
2.	<i>Khadir</i>	<i>Acacia catechu</i>	Heart wood	1.852 gm
3.	<i>Amalaki</i>	<i>Embelica officinalis</i>	Fruit rind	1.852 gm
4.	<i>Saptachakra</i>	<i>Salacia chinensis</i>	Root	1.852 gm
5.	<i>Daruharidra</i>	<i>Berberis aristata</i>	Bark	1.852 gm
6.	<i>Samanga (Lajjalu)</i>	<i>Mimosa pudica</i>	Whole plants	1.852 gm
7.	<i>Vidula(Chotapashanbheda)</i>	<i>Homonoia riparia</i>	Root	1.852 gm
8.	<i>Haridra</i>	<i>Curcuma longa</i>	Rhizome	1.852 gm
9.	<i>Patha</i>	<i>Cissampalo-us pareira</i>	Rhizome	1.852 gm
10.	<i>Amra</i>	<i>Mangifera indica</i>	Seed	1.852 gm
11.	<i>Haritaki</i>	<i>Terminalia chebula</i>	Fruit rind	1.852 gm
12.	<i>Abda (Nagarmotha)</i>	<i>Cyperus rotundus</i>	Rhizome	1.852 gm

Method of preparation of *Kashyayam*

Decoction (*Kvātha* or *Kasāya*) is the filtered liquid obtained by boiling coarse powder of drug(s) in proportion of 4, 8 or 16 [*Mrudu Dravya* - 4, *Madhyama Dravya* - 8 and *Kathina Dravya* - 16 respectively] times of water and reduced to one-fourth.

Therefore from above Contents of *Katak Khadiradi Kashaya* drugs is in *madhyama* form. For the preparation of decoction from no.1 to no.12 of drugs were taken in equal quantity and checked out for their identity, quantity and quality. The individual drugs were mixed in equal quantity and made into *bharad* form. After that two teaspoon (10 gm) of *Yavakuta Churna* (coarse powder) is taken for preparation of decoction in the 80 ml of water, a proper (mild) heat is given and when it reduces up to 20 ml filter through the muslin cloth, now decoction is ready to drink before meal (bid).The medicine *Yavakuta Churna* (coarse powder) was prepared in the pharmacy of N.I.A., Jaipur.

METHOD OF ADMINISTRATION

Orally in the form of decoction in a dosage of 20 ml twice in a day before meal.

DURATION OF THE TRIAL

The clinical trial was continued for 30 days with each patient with a 15 days review.

Table no. II –

Showing the Contents of “Niruryadi Gulika”.

S.No.	Drugs	Botanical Name	Part use	Quantity
1.	<i>Niruri</i>	<i>Phyllanthus reticulata</i>	Root	0.030 gm
2.	<i>Saptachakra</i>	<i>Salacia chinensis</i>	Root	0.030 gm
3.	<i>Nirmali</i>	<i>Strychnous potatoum</i>	Fruit	0.030 gm
4.	<i>Samudraphen</i>	-	Cuttle fish bone	0.030 gm
5.	<i>Emali</i>	<i>Tamarandus indica</i>	Bark of Seed	0.030 gm
6.	<i>Haritaki</i>	<i>Terminalia chebula</i>	Fruit rind	0.030 gm
7.	<i>Vibhitak</i>	<i>Terminalia belerica</i>	Fruit rind	0.030 gm
8.	<i>Amalaki</i>	<i>Embllica officinallis</i>	Fruit rind	0.030 gm
9.	<i>Kapittha</i>	<i>Limonia accedecima</i>	<i>Niryasa</i> (Resin)	0.030 gm
10.	<i>Kumud</i>	<i>Nymphea alba</i>	Seed	0.030 gm
11.	<i>Ayaskant</i>	<i>Magnetic iron</i>	Bhasma	0.030 gm
12.	<i>Gairic</i>	<i>Ochre</i>	Bhasma	0.030 gm
13.	<i>Haridra</i>	<i>Curcuma longa</i>	Rhizome	0.030 gm
14.	<i>Daruharidra</i>	<i>Berberis aristata</i>	Root	0.030 gm
15.	<i>Chandan</i>	<i>Santalum album</i>	Heart wood	0.030 gm
16.	<i>Sharkara</i>	<i>Sitopala</i>	Powder	0.030 gm
17.	<i>Udumbar</i>	<i>Ficus Glomerata</i>	Bark	0.030 gm

Niruryadi gulika was purchased from pharmacy of *Arya vaidya sala*, *Kotakkal*.

Dose and Anupana

Dose of *Niruryadi gulika* was 2 tablets (each of 500 mg) in the afternoon before lunch and at night before the dinner with Luke warm water for 30 days.

3. Pre Treatment Observations

All the patients have been studied along with the registration by noting down their demographic profile including their age, sex, address, occupation, education, socio economic status, marital status, life style, addictions, dietary habits etc. After preliminary registration, patients were subjected to detailed case history taking, physical, general and systemic examinations. In history and examination importance was given to symptoms of *Madhumeha*. During this all other relevant information's like *Ashtavidha Pariksha* and *Dashvidha pariksha* including assessment of *Sharirika Prakriti* and *Manasika Prakriti* (based on the features described in classical texts) etc. were noted.

4. Administration of Drug & Treatment Schedule

40 registered, clinically diagnosed and confirmed patients of *Madhumeha*(Hyperglycemic) were selected for the present clinical trial and randomly divided into following three groups out of that 30 patients has been completed clinical trial and 10 patients was drop out during the trial period.

GROUP- I: 10 patients of *Madhumeha* (Hyperglycemic) were administered *Katak Khadiradi Kashyayam* in a dose of 20 ml twice daily for a period of 30 days before meal.

GROUP- II: 10 patients of *Madhumeha* (Hyperglycemic) were administered *Niruryadi Gulika* in a dose of 2 tablet(each of 500 mg) with lukewarm water twice daily for a period of 30 days before meal.

GROUP- II: 10 patients of *Madhumeha* (Hyperglycemic) were administered *Katak Khadiradi Kashyayam* in a dose of 20 ml twice daily for a period of 30 days before meal and *Niruryadi Gulika* in a dose of 2 tablet (each of 500 mg) with lukewarm water twice daily for a period of 30 days before meal.

All the patients were advised to undergo following laboratory investigations before starting the trial to rule out a hyperglycemia and other illness; if present then exclude them from the trial.

a) Blood Examinations.

- (i) F.B.S. (Fasting Blood Sugar)
 - (ii) P.P.B.S. (Post *Prandial* Blood Sugar)
- b) C.B.C. and E.S.R.

Urine Examination.

- (i) Routine Examination
- (ii) Microscopic examination.
- (iii) F.U.S. (Fasting Urine Sugar)
- (iv) P.P.U.S. (Post *Prandial* Urine Sugar).

Patients were followed up after 15 days and changes, improvements, deterioration and any other effects produced after the therapy were noted down.

5. Criteria for Assessment:

After the completion of the treatment, the results were assessed by adopting the following criteria.

- Improvement in signs and symptoms of disease on the basis of symptoms score.
- Improvement in laboratory Investigation (i.e. reduce levels) on the basis of lab reports.

- Reduction in Objective assessment parameters.

For clinical evaluation the criteria can be divided in to two types:

1. Subjective Assessment
2. Objective Assessment

1. SUBJECTIVE ASSESSMENT

All symptoms taken for the assessment of clinical improvements were thoroughly examined and the severity of each symptom was rated before and after the trial for clinical assessment. For this purpose the following "Symptom Rating Scale" developed by *Prof. K. Govardhan et.al* was used.

A. *Prabhoot Mootrata (Polyuria) Frequency of Urine*

3-6 times /day, rarely at night	-	0
7-9 times / day, 0-2 times/night	-	1
10-12 times / day, 2-4 times/night	-	2
> 13 times /day,>4 times/night	-	3

B. *Swedadhikya (Excessive Sweating)*

➤ Normal Perspiration	-	0
➤ Mild after doing exertion	-	1
➤ Moderate after exertion	-	2
➤ Severe after exertion	-	3
➤ Perspiration without exertion	-	4

C. *Klama (Early fatigue)*

No fatigue	-	0
Mild after doing work	-	1
Moderate after doing work	-	2
Severe after doing work	-	3
Feeling fatigue without doing work	-	4

D. *Aalasya (Lassitude)*

➤ Normally active	-	0
➤ Hesitate to start work but once started completed	-	1
➤ Starts but does not complete	-	2
➤ Start work under compulsion	-	3

E. *Mukha Shosha (Dryness in mouth)*

➤ Absent	-	0
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➤ Mild	-	1
➤ Moderate	-	2
➤ Severe	-	3

F. *Vibhanda* (Constipation)

➤ Pass stool as per normal schedule	-	0
➤ Passes stool with strain, sometimes takes purgative	-	1
➤ Pass stool usually after 24 hrs, frequently takes purgative	-	2
➤ Pass stool/ per 2day	-	3
➤ Purgative doesn't work	-	4

2. OBJECTIVE ASSESSMENT

(a) Assessment of Body Mass Index (B.M.I). (weight in kg/height in meter ²)	18.5-24.9	0
25 – 29.9	130 -34.9	2
35 -39.9		3
>40		4

OBSERVATIONS AND RESULTS

Subjective improvement

After the completion of therapeutic trial there was marked improvement in the *Prabhuta mutrata*(Polyuria), *Klama* (early fatigue), *Alasya* (Lassitude), *Vibandh* (Constipation) (In Group 3) including *Ati sweda* (Sweating), *Mukha shosha* (Dryness of mouth)(In Group 1).

Clinical Improvement

Table no.III

Showing the overall comparative improvement in clinical feature of *Madhumeha* in three treated groups of 30 patients after course of the therapy.

S.No.	Symptoms	Group I			Group II			Group III		
		%	P	Result	%	p	Result	%	p	Result
1.	<i>Prabhotamutrata</i> (Polyuria)	33.33	< 0.05	S.	50	> 0.05	N.S.	33.3	<0.05	S.
2.	<i>Avilmutrata</i> (Avil mutrata)	21.1	> 0.05	N.S.	21.1	> 0.05	N.S.	44.4	> 0.05	N.S.
3.	<i>Pipasadhikya</i> (Excess thirst)	22.2	> 0.05	N.S.	22.2	> 0.05	N.S.	41.7	> 0.05	N.S.
4.	<i>Kshudhadhikya</i> (Polyphagia)	27.3	> 0.05	N.S.	0	> 0.05	N.S.	16.7	> 0.05	N.S.

5.	<i>Ati sweda</i> (Sweating)	42.9	< 0.01	S.	33.3	> 0.05	N.S.	20	> 0.05	N.S.
6.	<i>Hastapada & Sandhi shoola</i> (Pain in hands, feet & joints)	37.5	> 0.05	N.S.	30	> 0.05	N.S.	23.1	> 0.05	N.S.
7.	<i>Klama</i> (early fatigue)	25	> 0.05	N.S.	46.2	> 0.05	N.S.	38.9	< 0.05	S.
8.	<i>Mukha shosha</i> (Dryness of mouth)	38.5	< 0.01	S.	44.4	> 0.05	N.S.	0	> 0.05	N.S.
9.	<i>Alasya</i> (Lassitude)	40	< 0.05	S.	44.4	> 0.05	N.S.	53.3	< 0.05	S.
10.	<i>Vibandh</i> (Constipation)	50	< 0.05	S.	28.6	> 0.05	N.S.	87.5	< 0.05	S.
11.	<i>Karapada tala daha</i> (Burning sensation in hands and feet)	11.1	> 0.05	N.S.	16.7	> 0.05	N.S.	28.6	> 0.05	N.S.
12.	<i>Mukhamadhurya</i> (Sweetness in mouth)	40	> 0.05	N.S.	50	> 0.05	N.S.	40	> 0.05	N.S.
13.	<i>Jananang Kandu</i> (Genital Pruritis)	-	-	-	0	> 0.05	N.S.	100	> 0.05	N.S.
14.	<i>Kara pada tala supti</i> (Numbness in hands & feet)	-	-	-	42.9	> 0.05	N.S.	0	> 0.05	N.S.

Objective parameters:-

- Study on changes in blood sugar have revealed that there was significant reduction (Group I and II) and highly significant (in Group III) in the level of post Prandial blood sugar in the all the patients of three groups but the percentage of reduction was maximum in patients of Group-III, where *Katak Khadiradi Kashyayam* was administered with *Niruryadi Gulika*, also significant reduction in fasting blood sugar in patient of Group-III. (Table No. IV)
- Significant reduction in the level of post prandial urine sugar in Group-II and highly significant reduction was observed in patients of Group-III. (Table No. IV)

Table No. IV:

Showing the overall comparative improvement in lab parameters of Madhumeha (Hyperglycemia) in three treated groups of 30 patients after course of the therapy.

S. No.	Lab Investigation	Group I			Group II			Group III		
		%	P	Result	%	p	Result	%	P	Result
1.	Fasting Blood Sugar	6.85	> 0.05	N.S.	13.72	> 0.05	N.S.	18.51	< 0.05	S.
2.	Post Prandial Blood Sugar	16.97	< 0.05	S.	13.86	< 0.05	S.	18.65	< 0.001	H.S.
3.	Fasting Urine Sugar	20	> 0.05	N.S.	12.5	> 0.05	N.S.	66.7	> 0.05	N.S.

4.	Post Prandial Urine Sugar	17.9	> 0.05	N.S.	42.1	<0.02	S.	88.9	<0.001	H.S.
5.	HB gm%	3.27	> 0.05	N.S.	1.5	> 0.05	N.S.	0.23	> 0.05	N.S.
6.	ESR	20.4	> 0.05	N.S.	40	> 0.05	N.S.	10.5	> 0.05	N.S.
7.	TLC	7.29	> 0.05	N.S.	6	> 0.05	N.S.	9.06	> 0.05	N.S.

Table No. V:

Showing the overall comparative physiological improvement in three treated groups of 30 patients of *Madhumeha* (Hyperglycemia) after course of the therapy.

S. No.	Physiological parameters	Group I			Group II			Group III		
		%	p	Result	%	p	Result	%	p	Result
1.	Body Wt. (Kg)	0.5	> 0.05	N.S.	0	> 0.05	N.S.	0.5	> 0.05	N.S.
2.	BMI (Body mass index)	0.63	> 0.05	N.S.	0.03	> 0.05	N.S.	0.4	> 0.05	N.S.
3.	Systolic blood pressure (in mm Hg)	0.48	> 0.05	N.S.	0.76	> 0.05	N.S.	5	> 0.05	N.S.
4.	Diastolic Blood Pressure (in mm Hg)	1.3	> 0.05	N.S.	0.5	> 0.05	N.S.	0	> 0.05	N.S.

HS= Highly Significant, S= Significant, NS= Not Significant

Probable mode of action of *Katak Khadiradi Kashyayam*

Jatharagni mandya is present in *Madhumeha* and *Katu, Tikta rasa* present in *kashyayam* it may act in *vardhana* of *agni*. *Kashaya rasa* is present up to 83.33%, which may produces *Mutrasamgrahniya prabhava*. *Tikta, Kashaya rasa* present in this formulation produces *Shoshana* effect. Hence the *Prabhoota mutrata* in *Prameha* tend to regress.

When predominant *Guna* is present in research drug are assessed it becomes evident that most of the drugs possess *Laghu, Ruksha Guna* (i.e. 100% and 75%). *Ruksha guna* helps in alleviation of *Bahudrava shleshma* and *Abaddha meda*, the annexation of two being initial triggering event in *samprapti* of disease. Obstruction of *Vata* by *Kapha* and *medas* as *Kapha* here *aarambhak dosha* and *Vata* is *preraka dosha*. *Laghu* and *Ruksha guna* by virtue of their *kaphaghana* and *medoghana prabhava* help in reducing tissue weight. Now it can be suspected that *kashaya rasa, Laghu, Ruksha guna* like properties can further aggravate vitiated *Vata dosha* in *Madhumeha*. In this context it is proposed that here it is obstructed *Vata* (primarily by *Kapha & Medas*) which is causing trouble; *Vata* here may not be increased quantity wise in body, only obstruction is there in its natural passages which can be alleviated by *Kaphahara, medohara* drugs.

In the compound majority of drugs are found to have *Ushna Virya*. In 1979 at BHU, Varanasi has proved that substance having *Ushna Virya* is accountable for breakdown of fat at

mitochondrial level. *Meda* is invariably involved in pathogenesis of disease. According to

Ayurveda principles *Ushna virya* helps in alleviation of *Kapha* and *Vata*.

As far as *Vipaka* is concerned *katu vipaka* enhances *jatharagni*, *dhatvagni* and normalize metabolic process. *Sheeta virya* and *Madhura vipaka* helps in replenishment of *Ojus* which become depleted with disease progression owing to continued exposure of body to vitiated *Vata*. The drugs in compound formulation also possess *vayasthapana*, *chakshushya*, *rasayan*, *vrishya*, *grahi*, *lekhana*, *deepana* and *pachana* properties.

It has been clear from above account that Katak Khadiradi Kashyayam can well disintegrated *Samprapti* of *Madhumeha* by acting at various levels i.e. alleviating *dhatvagnimandya* owing to presence of certain *deepana pachana* drugs in it like *Bruhati*, *Mustak* and *Haridra* also *rukshata* and *laghuta* present in drug will combat increased *Kapha* and *meda* which similitude in their properties. *Aamalki* and *Haritaki* are two drugs, which are known to exert *rasayan prabhava* too thereby causing *oja vardhana*, which is being depleted in body of *Madhumehi* owing to chronic exposure to *Vata* in body.

Probable mode of action of *Niruryadi Gulika*:-

In *Niruryadi Gulika* the maximum drug having a *Kashaya*, *Tikta* and *Madhur Ras*; *Laghu*, *Rukshya* and *Guru Guna*; *Sheeta Virya*; *Madhur* and *Katu Vipaka*.

According to *Charak*,

“ किञ्चिद्रसेन कुरुते कर्म वीर्येण चापरम ।
द्वयं गुणेन पाकेन प्रभावेन च किञ्चन ॥”

Ch.Su. 26/71-72

According to above quotation drug acting on the body in various ways. The *Samprapti* of *Madhumeha* is described earlier, for breakdown of that *Samprapti* the action of above *ras*, *guna*, *virya* and *vipak* are described as follows.

In the *Niruryadi Gulika* the *Kashaya ras* (64.70%) possess a properties like *Sangrahi*, *Sthambhan*, *Sharirkledasyopayokta* due to that a polyuria is one of the main symptoms that can be manage, and due to the *Sharirkledasyopayokta* properties a *abhaddha meda* and *kleda* that can get soaked .

Tikta Ras(58.82%) having a properties like *Srotomukhavishodhan*, *Ama pachaka*, *Murcha*, *Daha*, *Kandu*, *Kushatha*, *Trushna prashamana*, *Dipana*, *Pachana*, *Lekana*, *ShariraKleda Soshana*, *Meda Soshana*, *Lasika Soshana*, *Swada Soshana*, *Mutra Soshana*. From these properties it is very clear that in the complication of *Madhumeha* like *Murcha*, *Daha*, *Kandu* and *Kushatha* it plays a role . A polydypsia is one of the prime symptoms that can be subside by this *ras* (*Trushna prashamana*).The above described *Kleda*, *Meda*, etc. *soshana* properties of this *ras* helps for breakdown of *Dosha –Dushaya Samurchana*.

Madhura Ras having a properties like *Bala-Varnakar*, *Marutagna*, *Trushana*, *Daha Prashaman*, *Prinan*, *Jivan*, *Santarpana*, *Brumhana*, *Sthryakara*, *Murcha Prashamana*. According to these properties it shows that it provide a strength to the *Madhumehi* patients because all *dhatu kshaya* is found in *Madhumeha* (*Ojomeha*) and also

helps to nourished all *dhatu(Saptadhatu poshak)*.

Aamalki and *Haritaki* are two drugs, which are known to exert *rasayan prabhava* too thereby causing *oja vardhana*.

According to *Guna*, *laghu* (70.58%) is *lekhana* therefore it work on *aavabadhya meda, kleda, and mamsa*; *rukshya* (52.94%) is *soshana* and *stambhana* properties it may be work on the polyuria.

A *Katu Vipaka* also doing the same work like a *mutra baddha*.

From above discussion it is hypothesises that, this *Gulika* work on the *Prameha* and *Madhumeha* like condition.

CONCLUSION

From present study following observations can be concluded:

- The disease *Madhumeha* is well documented in all perennial sources of *Ayurvedic* wisdom.
- *Madhumeha* has been discussed in *Prameha roga* as one of the *Vataj Prameha*. Literary evidence proves its modern correlate as Diabetes Mellitus.
- In this study it is found that *Madhumeha* mostly affects individuals in 5th, 6th and 7thdecade of life with slight male preponderance. Prevalence is seen more in married.
- As every sort of *Prameha* (20 types) bear every possibility to terminate ultimately into *Madhumeha* if left untreated so general aetiopathological factors, *purvapupa* etc. can well be appreciated for *Madhumeha* too. The study confirms that *Katak Khadiradi Kashyayam* And *Niruryadi Gulika* is effective in management of *Madhumeha* and definitely reduces the symptoms of illness that includes *Prabhuta mutrata*(Polyuria), *Klama* (early fatigue), *Alasya* (Lassitude), *Vibandh* (Constipation) (In Group 3) , including *Ati sweda* (Sweating), *Mukha shosha* (Dryness of mouth)(In Group 1).
- The chosen drug was effective in reducing Post Prandial Blood Sugar and Post Prandial Urine Sugar (In group 2 and 3) (highly significant in group 3 and significant in group 2) and also shows a significant result in Group 1 P.P.B.S .
- All the patients tolerated medicines very well and no side effects were reported by any of the patients, suggesting that the drugs selected for current clinical trial are absolutely safe for internal use.

After overall scrutiny, it can be concluded that the proposed *Katak Khadiradi Kashyayam* and *Niruryadi Gulika* in current research exhibits significant hypoglycaemic activity and can be given safely in patients of *Madhumeha*.

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