

ANTI DIABETIC (MADHUMEHA GHANA) ACTIVITY OF GUDUCHI KANDA GHANA VATI AND PATRA GHANA VATI- A PILOT STUDY**Swati Kansal^{1*}, Balaji S. Sawant² and Dr. Shraddha Chaudhary³**¹P.G. Scholar, Dravyaguna Vibhag, K.G. Mittal Ayurvedic College, Mumbai-02.²H.O.D. & Professor, Dravyaguna Vibhag, K.G. Mittal Ayurvedic College, Mumbai-02.³Assistant Professor, Dravya Guna Vibhag, K.G.Mittal Ayurvedic College, Mumbai 02.Article Received on
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02.**ABSTRACT**

A clinical study was conducted on patients of Madhumeha resembling conditions with diabetes mellitus type 2 to evaluate the madhumeha har Karma of Guduchi mentioned in Bhavprakash nighantu Guduchyadi varga. Guduchi patra is also used in madhumeha as references are available in Bhavprakash nighantu and Nighantu Ratnakar. The aim and objective of the study was to evaluate the efficacy of Guduchi kanda and patra ghanvati in madhumeha. The preliminary study was done on 8 cases of madhumeha w.s.r. to Diabetes mellitus. Results obtained from study revealed that it shows good effect in relieving subjective criteria like prabhut mutrata, avila mutrata and nidra adhikya. Also shown results on objective criteria like blood sugar. The results of the pilot trial provide preliminary support to continue work on larger sample sizes at OPD level.

KEYWORDS: Guduchi kanda, Guduchi patra, Tinospora cordifolia, Ghanvati, Madhumeha, Diabetes mellitus.

INTRODUCTION

Madhumeha mentioned in Ayurveda resembles closely with Diabetes. Madhumeha, a type of vataja prameha, develops due to dhatu kshaya and marga avrodha. It is said that all types of prameha if neglected get converted into Madhumeha. Guduchi also known as amrita has been a drug of choice for Madhumeha since ancient times. Study shows that 1, 2-substituted pyrrolidines present in Guduchi are responsible for anti-diabetic activity of Guduchi.^[1]

More than 422 million people worldwide out of 7960 million are affected by diabetes and the number will reach to around 642 million by 2040.^[2] In India currently 69 million people are diabetic out of 1380 million population while 80 million are prediabetic. Diabetes, an ICEBERG disease, is one among the non-communicable diseases.^[3] According to WHO, diabetes will be the 7th leading cause of death in 2030. Diabetes prevalence in India is 7.1 per cent and it is higher in urban (9.8%) than the rural area (5.7%) with higher proportion of males (7.1%) than females (6.8%).^[4] Approximately 98% of diabetic population in India suffers from Type 2 diabetes. According to a study published in Diabetologia in 2016, prolonged sitting may increase the risk of type 2 diabetes. The study concluded that an extra hour of sedentary time was associated with a 22% increased risk for type 2 diabetes and a 39% increased risk for metabolic syndrome.

For therapeutic purposes always Guduchi kanda is used. Even in animal studies Guduchi kanda is used. Although references of Guduchi patra are also there to be used in diabetes, patra are never used till date to cure diabetes in human beings. This study is therefore conducted to find out the efficacy of Guduchi patra. Also a comparison is made between Guduchi kanda and Guduchi patra to find out which one is better. Here Ghana vati kalpana is chosen as it is easy to take, carry and digestible and have a long shelf life.

Review of literature

Guduchi has many synonyms like vatsadani, chinnruha, tantrika, amrita, jivanti, somvalli, vishalya, madhuparni etc. The history of Guduchi dates back to Ramayana kaala.^[5]

Guduchi: Made of “gud rakshane” dhatu. It means it protects the body from various diseases. Chinnaruha, Chhinna, Chhinnodbhava: It grows even when cut. Vatsadani : Calves eat it, hence it is called 'vatsadani

Tantrika: It stretches and holds life. It protects the life of the whole family. Amrita: Death does not come by consuming it; hence it is called 'Amrita'.

Madhuparni: Due to the sweetness of its leaves, it is known as 'Madhuparni'. Vishalya: it cures shalya rupi vyadhi.

Jivantika: It protects the life of human beings so termed as Jivantika. Guduchi is mentioned in different nighantus:

Sr. no.	Nighantu	Varga
1	Bhavprakash nighantu	Guduchyadi varga
2	Dhanwantari nighantu	Guduchyadi varga

3	Raj nighantu	Guduchyadi varga
4	Kaiyadeva nighantu	Aushadhi varga
5	Shaligram nighantu	Guduchyadi varga
6	Shodhala nighantu	Guduchyadi varga

Guduchi is tikta, katu, kshaya rasatmak. Its veerya is ushna and is madhura vipaki. It is tridosha ghana, medhya, rasayan, aayush prada, hridya, and balya dravya. Its use is indicated in prameha, krimi, jwara, kushtha, trishna, vatarakta, pandu, chardi etc. According to Charak Samhita, Guduchi is the best among sangrahi, vathara, deepaniya, kapha vikar ghana, rakta vikara ghana and vibandh nashak dravyas.^[6]

Guduchi in samhita

Charak samhita ^[7]	Sushrut samhita ^[8]	Vagbhata ^[9]
Sandhaniya mahakashaya	Aragvadhadi gana	Triptighna mahakashaya
Triptighna mahakashaya	Shyamadi gana	Stanyashudhikaramahakashaya
Stanya Shodhan mahakashaya	Patoladi gana	Snehopaga mahakashaya
Snehopag mahakashaya	Kakolyadi gana	Trishnanigrahanmahakashaya
Trishnanigrahan mahakashaya	Guduchyadi gana	Jvarahara mahakashaya
Dahaprashman mahakashaya	Vallipanchmoola	Vayasthapan mahakashaya
Vayasthapan mahakashaya	Vata samshaniyavarga	Padmakadi gana, guduchyadi gana
Prajasthapan mahakashaya		Patoladi gana
		Aragvadhadi gana

Madhumeha

Madhumeha is mentioned in the Kaushik Sutra of Atharva Veda. Two terms are used there: "Aasrava" and "Madhumeha".

The word 'Prameha' consists of two sub-words. i.e. 'प्र' and 'मेह'. According to Vachaspathy the word Prameha is derived from "MihSechane" by adding 'Lue' Pratyaya to it "Mehati, Sinchati Mutraretamsi" which means to excrete. The prefix 'Pra' means 'Prakarshena'=excessive urination both in quantity and frequency. 'Mih Sinchane' = to flow and 'Ksharane' = loss of vital dhatu through urine.

The word Madhumeha consists of two words (a) Madhu and (b) Meha. The disease in which the excretion of urine is having quality concordant with Madhu (honey) in its colour, taste, smell, and consistency is called Madhumeha.

Pathogenesis

If prameha is not treated on time, then kleda vriddhi and dhatu shaithilya occurs. All tissues

get depleted which leads to ojokshaya and causes madhumeha.

Samprapati ghatak

Dosha: vata pradhan tridosha

Dushya: rasa, rakta, mansa, meda, majja, shukra, vasa, majja, lasika, oja. Strotas: Mutra vaha, Medovaha, Mamsavaha, Swedavha and Udaka Vaha strotas

MATERIALS AND METHODS

Plant source: Botanically identified *Tinospora cordifolia* belonging to family Menispermaceae is taken. Its kanda and patra were procured from natural sources and identified by the Department of Dravyaguna, Smt. K.G. Mittal Ayurved Mahavidyalaya, Charni Road, Mumbai, India. Authenticated and standardised by Alarsin pharmaceuticals, Andheri, Mumbai, India in May 2021.

Source of the patients: Patients were selected after subjection them through clinical examination from OPD of Dravyaguna Department of Smt. K.G. Mittal Ayurved Mahavidyalaya, Charni Road, Mumbai, India.

Preparation of medicine

Guduchi kanda and patra were dried first day in sunlight after washing thoroughly in running water then in shadow. Guduchi stems are cut into pieces; they are then washed and crushed. After this small pieces of stems were boiled with 8 times water, until it reduced to one fourth parts. After then it is sieved and boiled again with continuous stirring so that it does not get stuck to the bottom of loha patra. It takes approx 24 hours of heat to extract ghana from a 35 kg stem. Stir the content continuously until the water evaporates. For 4 kg kanda ghana approximately 35 kg stems were required. After extraction of ghana 10-20% giloy churna is added to it to make it solid like wheat dough. Then by pill making machine pills are made. Same procedure is applied for making patra ghana vati. About 140kg of patrawere taken to extract 4kg ghana.



Collected guduchi Patra and Kanda.



Kwath preparation



Prepared ghana vati

Place of work: Clinical trial was done at Dravyaguna department of Smt. K.G. Mittal Ayurvedic Mahavidyalaya, Mumbai, India.

Methods of collection of data

Written and informed consent was taken of the enrolled patients based on the classical signs and symptoms of Sthaulya, the patients screening for inclusive criteria irrespective of sexes between the age group 18-60 years were selected from the OPD of Dravyaguna department of Smt. K.G. Mittal Ayurvedic Mahavidyalaya, Mumbai, India. Pilot study was carried out on 8 patients divided into 2 groups of 4 patients each according to inclusion and exclusion criteria. Group A was given guduchi kanda ghanavati while group B was given guduchi patra ghanavati.

Drug administration details

Drug	Group a- guduchi kanda ghana vati and group b- guduchi patra ghana vati
Kalpana	Ghana vati
Dose	2 ratti
Sevana kala	Praga bhakta
Period of clinical trial	3 months
Mode of administration	Oral
Anupana	Koshna jala
Follow up	15 days
Diet pathya-apathya	Shastrokta anti diabetic diet pattern
Analysis	Subjective- mann whitney u- test objective - unpaired 't' test
Medium of dissertation	Sanskrit and english

Inclusion criteria

1. Age- 18 to 60yrs
2. Sex- Irrespective (Male, Female, Transgender)
3. Race- No Barrier
4. Religion- No Barrier
5. Economic Status- No Barrier
6. If yes in any of the 2 -
 - i. Blood Sugar Level- Fasting > 126 & ≤ 200 mg/dL or Postprandial > 200 mg/dl & ≤ 350 mg/dl or
 - ii. HbA1C > 6.1% & < 8.2%

Exclusive criteria

1. Malignant and accelerated hypertensive
2. Pregnant women or planning to be pregnant within 6 month
3. Lactating Mother
4. Diabetes with known complications
5. Patient taking Insulin.
6. Immuno-suppressive diseases
7. Patients below 18 years and above 60 years of age.

Plan of study: In this pilot study 8 patients were selected as per inclusion and exclusion criteria. 500mg Haridra Ghanvati has been given to each patient twice before meals for 3 months.

Name of centre	Concerned institute OPD
Written consent	Before starting treatment
Number of patients	8
Drug	Guduchi
Kalpana	Ghanavati
Dose	500mg before meal twice a day
Sevan kala	Pragbhakta
Period of clinical study	3 months
Mode of administration	Oral
Follow up	Follow up after every 15 days till completion of 3 months
Pathya- apathya	Will be explained to every patient individually as mentioned in Sthaulya

Clinical assessmentsubjective criteria

1) Pippasa: (Polydipsia) (Excluding environmental variation)

Grade 0- Daily normal quantity of water to quench thirst (≤ 2 lit) with no mukha shushkata.

Grade 1- Requires additional water more than normal (2- 2.5lit) Still mukha shushkata.

Grade 2- Requires additional water than normal (2.5 – 3lit) Still mukha shushkata. Grade 3-

Requires additional water > 3 lit. Than normal still mukha shushkata.

2) Prabhut- Mutrata (polyuria) (Excluding environmental variation, Color & Consistency)

Grade 0- 3 to 6 times per day, rarely at night.

Grade 1- 6 to 9 times per day, 0 to 2 times at night.

Grade 2- 9 to 12 times per day, 2 to 4 times at night.

Grade 3- More than 12 times per day, more than 4 times per night.

3) Avila-mutrata (turbidity)

Grade 0- crystal clear fluid.

Grade 1- faintly cloudy, smoky or hazy with turbidity barely visible.

Grade 2- turbidity clearly visible but newsprint easily read through the test tube. Grade 3- newsprint cannot be read through the test tube.

4) Nidradhikya (sleep)

Grade 0- Normal sleep, 6-8 hours/24 hours.

Grade 1- Sleep upto 8 hours/24 hours with Angagaurava.

Grade 2- Sleep upto 8 hours/24 hours with Angagaurava and Jhrimba. Grade 3- Sleep upto 10 hours/24 hours with Tandra.

Grade 4- Sleep upto >10 hours/24 hours with tandra and klama.

5) Swedadhikya (Perspiration)

Grade 0- Sweating after heavy work and fast movement or in hot Weather. Grade 1- Profuse sweating after moderate work and movement.

Grade 2- Sweating after little work and movement.

Grade 3- Profuse sweating after little work and movement. Grade 4- Sweating even at rest and/or in cold weather.

Objective criteria

1. Blood Sugar Level- Fasting > 126 & ≤ 200 mg/dL or Postprandial > 200 mg/dl & ≤ 350 mg/dl or ii. HbA1C > 6.1% & < 8.2%

Statistical analysis of data

The value of data was expressed as a percentage of relief. The data was analysed by standard mean deviation, mean deviation for comparing before and after treatment obtained scores.

Observation

In this all 8 patients completed the study. In this 5 patients were female and 3 were male. Out of them 3 females and 1 male were given guduchi kanda ghana vati and 2 females and 2 males were given guduchi patra ghana vati.

All the above Subjective Parameters P value was <0.0001, which statistically differs and is significant.

Effect on objective criteria was also statistically significant. Demographic detail of patient selected in pilot study is given in the end. Guduchi kanda ghana vati.

S. no.	Reg.no	Age	Sex	Occupation	Education	Economic status	Diet	Addiction	Family history	Prakruti	Agni
1	202126362	42	M	Accountant	T.Y.B.Com	Middle	Veg	Tea	No	VP	Manda
2	202127141	37	F	Homemaker	9th	Lower middle	Mix	Tea	No	KP	Vishama
3	202127683	40	F	Homemaker	5th	Lower middle	Mix	Tea	Yes	KP	Vishama
4	202128423	36	F	Homemaker	B. tech	Middle	Veg	Tea, coffee	Yes	VK	Vishama

Sr.no.	Pippasa vridhhi		Prabhut mutrata		Avila mutrata		Nidradhikya		Swedadhikya	
	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	3	0	1	0	2	1	3	1	4	1

2	1	0	2	1	1	0	2	1	3	1
3	2	1	2	1	1	0	3	1	2	1
4	1	0	2	1	2	1	3	1	2	0

Sr. no.	FBS		PPBS		HbA1C	
	BT	AT	BT	AT	BT	AT
1	120	108	183	160	6.1	6.0
2	114	106	150	145	11	11.2
3	124	100	189	160.9	6.9	6.7
4	120	79	197	156	6.1	5.6

Guduchi patra ghana vati

S. N O.	Reg. no	Age	Sex	Occupation	Education	Economic status	Diet	Addiction	Family history	Prakruti	Agni
1	202129039	56	M	GST govt. employee	B.Sc. chemistry	Middle	Veg	Tea	Yes	VK	Manda
2	202119561	53	F	Homemaker	7th	Middle	Veg	Nil	Yes	VK	Manda
3	202128425	55	F	Homemaker	10th	Middle	Veg	Nil	Yes	VK	Manda
4	202128873	41	M	Farmer	10th	Middle	Veg	Tea	Yes	VP	Vishama

Sr. no.	Pippasa vridhi		Prabhut mutrata		Avila mutrata		Nidradhikya		Swedadhikya	
	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	2	1	2	1	2	1	2	1	3	1
2	2	1	2	1	2	1	2	1	3	1
3	1	0	2	1	1	0	2	1	2	2
4	1	0	1	0	2	1	2	1	2	1

Sr. no.	FBS		PPBS		HbA1C	
	BT	AT	BT	AT	BT	AT
1	117	104	150	144	7.3	7.0
2	89.2	79	147.1	134	6.3	6.0
3	110	98	183	179	6.1	6.2
4	119	104.5	186	175	6.2	6.0

DISCUSSION

In this study 8 patients were selected for pilot study and following observation were found which has been recorded in before and after treatment chart as per the gradation. It has been seen that the FBS and PPBS of all the patients has been reduced to normal value and HbA1C also got reduced except in 2 patients.

Probable mode of action of guduchi in madhumeha

Under various etiological factors, vitiation of Kapha, Pitta, Meda and Mamsa takes place, which in turn barricades the Vata movement and makes it vitiated. This unstable/disturbed Vata leads Ojas to Basti (Urinary tract) and this Ojas go astray via urine, thus Madhumeha gets developed. Guduchi, by virtue of its Rasayana property targets all seven dhatus by providing progressive nourishment and brings an equilibrium state of dosha and dhatu, thus helps in retaining Ojas within the body. Guduchi is praised as the superior Samshamana (Stabilized aggravated doshas) herb in Ayurvedic classics.

In Madhumeha, Agni, both at the level of jatharagni (GI level) and at dhatvagni level (tissue level) are disturbed. Because of dhatwagnimandhya (Insulin resistance, impaired glucose and fat metabolism), anushangi nature (Long course of the disease) and tridosha involvement (Multifactorial), a multi-target approach is mandatory. Impairment of jatharagni (GI secretions/first phase insulin response to oral glucose intake or the impaired incretin effect) not only impairs the primary step of digestion but also impairs the dhatvagni also.

Deepana effect of Guduchi can be related to insulin stimulating action, thus improving first phase insulin response and improves incretin effect, which consequently leads to reduction of burden on beta cells of pancreas (Seat of Agni). This further reduces the Amavastha (Postprandial hyperglycemia), leading to improvement in the status of Agni.

Dhatvagnimandya is characterized by impaired pachana activity (Impaired glycogenesis, impaired lipogenesis, decreased peripheral glucose utilization etc). Amavastha results in Prabhuta mutrata (Polyuria) in Madhumeha. Pachana action of Guduchi stimulates Dhatavagni, particularly Medagni and Mamsagni, which digests Ama (Improves lipid profile and glycemic control) and subdues Apakva meda (Ameliorate the derangements in lipid metabolism).

Rasayana and Tridosha Hara Effect of Guduchi not only helps the agni (insulin action and sensitivity) to work properly but also nourishes the undernourished tissues of the body (by improving insulin sensitivity, supplying essential ions like Zn, Mn, Cl, etc, free radical scavenging effect, antioxidant action and prevents oxidative stress related to diabetes).

Additionally, Rasayana and Vaya Sthapana properties show immunomodulation to boost up or restore functional immunity and improve the quality of life of diabetics. Furthermore,

Trishnahara property relieves polydipsia and Sangrahi property reduces excessive kleda and prevents polyuria. Medhya action of Guduchi might improve age related dementia (as type 2 diabetes is 40+ age group disorders) and relieve stress. It is well-known that stress related anxiety has been shown as a major risk factor for type-2 diabetes mellitus. Balya and Vrishya property improves vigor and strength to counteract fatigue and impotency, the common remote manifestations in diabetes. By virtue of Chakshusya property, Guduchi may prevent complications like retinopathy, vision impairments etc. Thus, by acting on both Jatharagni and Dhatwagni level, Guduchi broke the Samprapti of Madhumeha. It prevents Ojokshaya (Deterioration of immunity) and counteracts the complex metabolic impairment and manifestation of disease.

TIKTA RASA does deepana, pachana, and lekhana. Deepana karma ignites jatharagni. Jatharagni stimulates dhatwagni. Jatharagni is responsible for digestion and metabolism at gastrointestinal level. Dhatwagni is responsible for tissue metabolism. Dhatwagni acts mainly on medagni and mansagni.

Pachana helps in digestion of aam and also subdues apakva meda and corrects kapha-meda dushti.

Tikta rasa also does lekhana karma, strotto shodhan and pacifies pitta.

CONCLUSION

On comparing the before and after treatment results it is observed that a significant result has been found and the study can be selected for further detailed study in larger sample size and for a longer duration than one month. As it corrects the dhatvagni Mandya and also having the snigdha, Laghu property, tikta-katu rasa it may tend to correct pathogenesis of madhumeha. Madhumeha Ghana karma of guduchi ghana vati is seen in all the eight patients.

REFERENCES

1. Wadkar KA, Magdum CS, Patil SS, Naikwade NS. Anti-diabetic potential and Indian Medicinal plants. J Herbal Med Toxicol, 2008; 2: 45- 50. {Google Scholar}
2. <https://www.who.int/health-topics/diabetes>
3. Park's Textbook of Preventive and Social Medicine by K. Park, Published by Banarasidas Bhanot, 2019; 422: 25.
4. www.who.int-Beat Diabetes Programme

5. Shri Bhavamishra krit Bhavaprakash nighantu (INDIAN MATERIA MEDICA), commentary by Prof. K.C. Chunekar, Edited by Late Dr. G.S. Pandey, Guduchyadi varga, Chaukhambha Bharati Academy, Varanasi, 2010; 257: 1 – 5.
6. Pandit Kashinath Pandey and Dr. Gorakhnath Chaturvedi, Charak Samhita of Agnivesha; Elaborated by Mahrishi Charak and redacted by Acharya Dridhbala, Sutra sthana, Yajja purushiyam adhyaya, Chaukhambha Bharati Academy, Varanasi, 2013; 46: 25 – 40.
7. Pandit Kashinath Pandey and Dr. Gorakhnath Chaturvedi, Charak Samhita of Agnivesha; Elaborated by Mahrishi Charak and redacted by Acharya Dridhbala, Sutra sthana, Shadavirechan shatashritya adhyaya, Chaukhambha Bharati Academy, Varanasi, 2013; 70: 4 -8.
8. Dr. Ambika Dutt Shastry; Sushrut Samhita, Sutra sthana; Dravya sangrahaniya adhyaya, Purvardha, Chaukhambha Sanskrit Sansthan, Varanasi, 2015; 183: 38 – 6.
9. Ashtanga sangraha with Hindi commentary by Kaviraj Atridev Gupta, vividh aushadh vigyaniyam adhyaya, Chowkhamba Krishnadas academy Varanasi, 2004; 125: 12, 61-62.