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Role of diet and lifestyle in the management of *Madhumeha* (Diabetes Mellitus)

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Abstract

From ancient to modern times, the perspective to visualize the management of *Madhumeha* (DM) has shifted from holistic to drug oriented. Therefore, until a few years ago, the revival of the holistic approach, the Ayurvedic diet, and lifestyle were not being much focused. This research work was planned to evaluate the extra effects of Ayurvedic *Ahara* and *Vihara* in the management of *Madhumeha* and to project them socially. A total of 30 patients were selected and divided into two groups. Group A was treated with Ayurvedic *Ahara* and *Vihara* with *Varadi Kwatha* and group B was treated with only *Varadi Kwatha* for 8 weeks. The study showed highly significant results in most of the parameters in both the groups. However, further trials with increased number of patients are needed to support the current observations.

Key words: *Ahara*, Diabetes Mellitus, diet, lifestyle, *Madhumeha*, *Varadi Kwatha*, *Vihara*

Introduction

Since a long time, Ayurveda has been emphasizing more on the importance of diet and lifestyle in the maintenance of health, according to which a healthy man is referred as "he who indulges daily in healthy diet and lifestyle activities, who discriminates between wholesome and unwholesome and acts accordingly, who is not attached too much to the worldly affairs, who develops the habit of charity, considering all as equal, is truthful, pardoning, and keeping company of good persons becomes free from diseases."[1]

It is also said that in both the conditions, viz. health and disease, the wholesomeness and the unwholesomeness is a prime factor to be thought about, as without proper diet, the use of any drug is futile.[2]

As said earlier, the consideration of Ayurveda with lifestyle also has to be given due emphasis for the maintenance of the standards of health. In this segment, the entrainment and entertainment of the mind also plays a vital role, as no human activity takes place without the indulgence and proper setting of the mind. Hence, the planning of lifestyle in accordance with the day-to-day requirement of a person by giving due importance to the entrainment and entertainment of the mind is quite crucial.

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Reviewing the current practices of diet and lifestyle including the mode of food preparation, raw materials, food combinations and food timings, timings of work and rest, types of work, the modes of entertainment and recreation, surrounding environment, *Yoga* such as *Asanas* (postures), *Pranayama* (bioenergy boosting techniques), *Surya Namaskara* (sun salutation), *Agnisara* (bioenergy detoxification), prayer, etc., is really in a state where it is very essential to focus if the tranquility, sanctity, and fruitfulness of human life is to be maintained.

Amongst the many dreadful conditions arising because of modern-day living, Diabetes Mellitus (DM) is a giant disease considered as one of the archenemies of the humankind caused by improper diet and lifestyle. It is often referred to as a "silent killer." Diabetes and its complications pose a major threat to public health resources throughout the world. Looking at its gravity, the World Health Organization (WHO)[3] has taken up a close vigilance and survey about this problem the world over.

The WHO's statement on primary health care program states that there is a "collective failure to deliver in line with these values which is painful and deserves our greatest attention."[4] Also, there is "an inability of health services to deliver the level of national coverage that meets the stated demand and changing needs."[5] This scientific holistic work inspired from Ayurveda with a special focus on diet and lifestyle [Table 1] can seriously contribute into the DM management and primary health care program.

Taking these facts into consideration, the present study was undertaken to evaluate the effect of Ayurvedic diet and lifestyle with *Varadi Kwatha* in *Madhumeha* (DM).

Materials and Methods

Patients

For the present study, 30 diagnosed patients of *Madhumeha* (DM type 2) from the Outdoor Patient Department of Basic Principles, Institute for Post Graduate Teaching and Research in Ayurveda, Jamnagar were registered on the basis of signs and symptoms of *Madhumeha* as per Ayurvedic classics and modern medicine.

Inclusion criteria

- Patients of either sex in the age group of 30-65 years
- Both obese and non-obese patients
- Patients showing classical signs and symptoms of *Madhumeha* as below were included in the study.

Prabhuta Mutrata, *Avila Mutrata*,[6] *Pipasadhikya*,[7] *Alasya* with *Utsahahani*,[8] *Kshudhadhikya/Mahashanama*,[9] *Pindikodveshthana*,[7] *Karapadatala Daha*,[10] *Karapadatala Suptata*,[8] *Swedadhikya*,[11] *Gala Talu Shosha*,[8] *Daurbalya*,[12] *Shrama Shwasa*,[11] *Shula*, *Alasya/Utsahahani*,[10] *Klaibya*,[11] *Nidradhikya* and *Purishabadhdhata*.[13]

Criteria for diagnosis of DM by American Diabetic Association:[14]

1. Patients having random blood sugar level >200 mg/dl or
2. Fasting blood sugar (FBS) >126 mg/dl up to 375 mg/dl or
3. Postprandial blood sugar (PPBS) >200 mg/dl up to 500 mg/dl.

Exclusion criteria

- Patients with juvenile diabetes
- Patients less than 30 years and more than 65 years
- Emergency cases in DM
- Patients having insulin-dependent DM (IDDM) and receiving insulin (type 1)
- Excessive blood glucose: FBS > 375 mg/dl and PPBS > 500 mg/dl
- Chronic complications (microvascular and macrovascular).

Grouping

The registered 30 patients were divided into two groups:
Group A – Ayurvedic diet and lifestyle + *Varadi Kwatha* (n = 6)
Group B – *Varadi Kwatha* (n = 24).

Posology

Group A

Patients in group A were treated with *Varadi Kwatha*[15] [Table 2] and instructed to follow diet and lifestyle plan as provided in Table 1. *Varadi Kwatha* (decoction) was administered in a dose of 24 ml twice a day in the morning and evening on empty stomach (before food) for 8 weeks.

Group B

Patients in group B were treated only with *Varadi Kwatha*. It was administered in a dose of 24 ml twice a day in the morning and evening on empty stomach (before food) for 8 weeks.

Criteria for assessment

Objective parameters

The following parameters were assessed objectively:

FBS level, PPBS level, fasting urine sugar, serum triglyceride, serum cholesterol, high density lipoprotein (HDL) cholesterol, low density lipoprotein (LDL), very low density lipoprotein (VLDL), serum creatinine, and HbA1c

Subjective parameters

Description	Scoring
1. *Prabhuta Mutrata* (Polyuria)	
1.50-2.00 l/24 h	0
>2.00-2.50 l/24 h	1
>2.50-3.00 l/24 h	2
>3.00 l/24 h	3
2. Frequency of urine	
3-5 times per day, nil or rarely at night	0
6-8 times per day, 1-2 times per night	1
9-11 times per day, 3-4 times per night	2
>11 times per day, >4 times per night	3
3. *Pipasaadhikya* (Polydypsia)	
Feeling of thirst 7-9 times/24 h, either/or intake of water 5-7 times/24 h with quantity 1.5-2.0 l/24 h	0
Feeling of thirst 9-11 times/24 h, either/or intake of water 7-9 times/24 h with quantity 2.0-2.50 l/24 h	1
Feeling of thirst 11-13 times/24 h, either/or intake of water 9-11 times/24 h with quantity 2.50-3.00 l/24 h	2
Feeling of thirst >13 times/24 h, either/or intake of water >11 times/24 h with quantity >3.00 l/24 h	3
4. *Avila Mutrata* (Turbidity in urine)	
Crystal clear fluid	0
Faintly cloudy or hazy with slight turbidity	1
Turbidity clearly present and newsprint easily read through test tube	2
Newsprint not easily read through test tube	3
Newsprint cannot be visualized through test tube	4
5. *Bahavashi-Kshudha-Adhika* (Increase in appetite)	
As usual/routine	0
Slightly increased (1-2 meals)	1
Moderately increased (3-4 meals)	2
Markedly increased (5-6 meals)	3
6. *Bahavashi-Abhyavaharana Shakti* (Excess intake of food)	
Person taking food in normal quantity twice in a day	0
Person taking food in excessive quantity twice in a day	1
Person taking food in moderate quantity twice in a day	2
Person taking food in less quantity twice in a day	3
Person taking food in less quantity once in a day	4
Person not at all taking food	5
7. *Kara-Pada Suptata* (Numbness in palm and foot)	
No numbness in palm and foot	0
Incontinuous numbness in palm and foot	1
Continuous numbness in palm and foot, but bearable and not severe	2
Continuous, severe, and unbearable numbness in palm and foot	3

8. *Swedadhikya* (Excess perspiration)
   - Sweating after some strenuous or heavy work or in hot and humid weather — 0
   - Profuse sweating after moderate work and movement — 1
   - Sweating after little extra work than routine and movement — 2
   - Profuse sweating after routine work — 3
   - Sweating even at rest or in cold climate — 4
9. *Daurbalya* (Weakness)
   - Can do routine exercise/work — 0
   - Can do moderate exercise with hesitancy — 1
   - Can do mild exercise only, with difficulty — 2
   - Cannot do even mild exercise — 3
10. *Alasya/Utsahahani* (General debility)
   - Doing satisfactory work with proper vigor and in time — 0
   - Doing satisfactory work with late initiation, likes to stand in comparison to walk — 1
   - Doing unsatisfactory work with late initiation, likes to sit in comparison to stand — 2
   - Doing unsatisfactory work with very late initiation, likes to lie down in comparison to sit — 3
   - Does not want to do work with no initiation, likes to sleep in comparison to lie down — 4
11. *Shula* (Pain)
   - No pain — 0
   - Pain in joint, routine movements normal — 1
   - Pain in joint, slight limitations of movements — 2
   - Pain in joint, limitations of movements with much reduced activity — 3
12. *Shrama Shwasa* (Dyspnea)
   - Dyspnea after heavy work and walking — 0
   - Dyspnea after moderate work and walking — 1
   - Dyspnea after mild work — 2
   - Dyspnea even at resting condition — 3
13. *Tandra/Nidradhikya* (Excess sleep)
   - Normal and sound sleep for 6-8 h/24 h with feeling of lightness and relaxation in the body and mind — 0
   - Sleep >8-9 h/24 h with slight heaviness in the body — 1
   - Sleep >9-10 h/24 h with heaviness in the body associated with *Jrimbha* — 2
   - Sleep >10 h/24 h with heaviness in the body associated with *Jrimbha* and *Tandra* — 3
14. *Ruchi* (Taste)
   - Equal willing toward all the foods — 0
   - Willing toward some specific foods or *Rasavishesha* — 1
   - Willing toward only one among *Katu*, *Amla*, *Madhura* food stuffs — 2
   - Willing toward only the most liking foods and not the others — 3
   - Unwilling for any food, could take meal — 4
   - Unwilling for any food, even could not take meal — 5
15. *Purishabadhdhata* (Constipation) or *Malaupathijatila Bhava*
   - Stool passes as per normal schedule — 0
   - Passes stool with strain, sometimes takes purgative — 1
   - Passes stool after more than 24 h, frequently takes purgative — 2
   - Passes stool after a gap of 1 day, normal purgatives do not work — 3
16. *Klaibya* (Libido)
   - Normal — 0
   - Decreased frequency with normal performance — 1
   - Decrease frequency with insufficiency — 2
   - No sexual stimulation at all — 3
17. *Pindikodveshtana* (Cramps)
   - No cramps — 0
   - Cramps after walking more than 1 km — 1
   - Cramps after walking ½ km — 2
   - Inability to walk even ½ km — 3

Assessment of overall effect of therapy:

Criteria	Grading
Cured	100% relief
Marked improvement	≥75% relief
Moderate improvement	≥50-74% relief
Mild improvement	≥25-49% relief
No improvement	≤25% relief

Observations

Among the registered patients, 100% were married, 90% were vegetarians, 70% were above the age of 50 years, and 73% belonged to middle socio-economic class. In dietary habits, 83.33% patients were indulging in milk products, 73.33% were taking *Guru Ahara*, and 70% were taking *Madhura Rasatmaka Ahara*. 86.67% of the patients were having *Chinta* (worry), 73.33% were doing *Shayya Swapna Prasanga* (comfortable sitting and rest), 83.33% were not doing *Vyayama* (no exercises), and 80% were doing *Divaswapna* (day sleep).

Pipasadhikya was seen in 70% of the patients, *Daurbalya* in 86.67%, *Prabhuta Mutrata* in 73.33%, and *Klaibya* in 86.67% of patients.

Results

Effect of therapies on subjective parameters

Prabhuta Mutrata was relieved in 100% of patients in group A and 81% in group B. *Avila Mutrata* was relieved in 100% of group A patients and 86% of group B patients. Relief in *Kshudhadhikya* was seen in 100% in both the groups. Relief in *Karapadatala Daha* and *Karapadatala Suptata* was seen in 75% patients of group A and 81% patients of group B. In *Swedadhikya*, there was a relief of 75% in group A and 86.65% in group B; in *Galatalushosha*, a relief of 100% was observed in group A and 76% in group B; in *Daurbalya*, it was 86% in group A and 78% in group B, whereas in *Pindikovestana*, it was seen in 75% of group A and 71% of group B. In *Pipasadhikya*, 100% relief was seen in group A and 84% in group B; in *Shula*,

it was 100% in group A and 74% in group B; in *Klaibya*, it was 90% in group A and 76% in group B; in *Nidradhikya*, 86% relief was observed in group B; and in *Purishabadhdhata*, 100% relief was seen in both the groups [Tables 3 and 4].

In group A, statistically highly significant results were observed in *Prabhuta Mutrata* ($P < 0.001$) and *Klaibya* ($P < 0.01$), while significant results ($P < 0.05$) were observed in *Pipasadhikya*, *Kshudhadhikya/Mahashanama*, *Abhyavaran Shakti*, *Gala Talu Shosha*, *Daurbalya*, *Shrama Shwasa*, *Shula*, *Alasya/Utsahahani*, and *Purishabaddhata* [Table 3].

The effect of *Varadi Kwatha* in patients of group B was found to be statistically highly significant in *Prabhuta Mutrata*, *Avila Mutrata*, *Pipasadhikya*, *Pindikoveshtena*, *Karapadatala Daha*, *Karapadatala Suptata*, *Swedadhikya*, *Galatalushosha*, *Daurbalya*, *Shrama Shwasa*, *Shula*, *Alasya/Utsahahani*, *Klaibya*, *Nidradhikya*, and *Purishabaddhata* [Table 4].

Effect of therapies on objective parameters

In group A, statistically significant ($P < 0.05$) results were observed in FBS, PPBS, fasting urine sugar, HDL cholesterol, and HbA1c, while insignificant results were observed in serum triglyceride, serum cholesterol, serum creatinine, LDL, and VLDL [Table 5].

In group B, highly significant results were obtained in FBS ($P < 0.001$) and PPBS ($P < 0.01$). Significant results ($P < 0.05$) were obtained in serum triglyceride, serum cholesterol, and VLDL, while insignificant results were obtained in fasting urine sugar, HDL cholesterol, serum creatinine, and LDL [Table 6].

Overall effect of therapy

In group A, 4 (66.67%) patients showed moderate improvement, 1 (16.67%) patient showed mild improvement, and 1 (16.67%) patient showed no improvement. In group B, 17 (70.83%) patients showed moderate improvement, 6 (25%) patients showed mild improvement, and 1 (4.17%) patient showed no improvement [Table 7].

Discussion

For *Prabhuta Mutrata*, in both the groups, the results [Tables 3 and 4] were statistically highly significant ($P < 0.001$) as *Ahara* and *Vihara* with *Varadi Kwatha* may help to regulate the *Udakavaha* and *Medovaha Srotas*, and thus, will have an impact on the *Mutravaha Srotas*. Therefore, it helps in regulating the water balancing system of the body.

With regard to *Klaibya* also, in both the groups, the results were highly significant ($P < 0.01$ and $P < 0.001$, respectively, in groups A and B), as the *Varadi Kwatha*, with lifestyle practices such as *Pranayams*, exercise, fasting, etc., helps in rectifying *Srotorodha* and, thus, generating *Ruchi*, *Utsaha*, and *Bala* in life and for enjoyment of sex.

The effects of the therapy on FBS and PPBS were statistically significant ($P < 0.05$) in groups B and A. With respect to fasting urine sugar, the result was significant ($P < 0.05$) in group A. This could be attributed to lifestyle modifications like *Padagamanam*, exercises, *Asanas*, fasting, etc., and the selected light diet which helped to enhance blood circulation and the metabolism of glucose, whereas in group B, the result was insignificant due to absence of Ayurvedic diet and lifestyle modifications.

The effects on the symptoms *Pipasaadhikya* and *Galatalu Shosha* were statistically highly significant ($P < 0.001$) in group B. Possibly, *Varadi Kwatha* helps to utilize the unspent glucose in the blood and relieves the accumulated *Kapha* and channelizes the *Vayu* properly due to *Tikta Rasa* which is *Akasha* and *Vayu Mahabhoota*. Thus, it helps to regulate the *Udakavaha* and *Medovaha Srotas* and, therefore, regulates the water balancing system of the body and mouth dryness, while in group A the result was significant as the number of patients was less.

In relation to *Kshudhadhikya* and *Abhyavarana Shakti*, the result was statistically significant in group A due to lifestyle practices like *Padagamanama*, exercises, *Asanas*, fasting, etc., and the selected light diet helps to enhance the power of *Agni* (metabolism), while in group B, the result was insignificant.

In *Daurbalya* also, the result was statistically significant in group A as the *Varadi Kwatha* helps to utilize the unspent glucose in the blood to release energy. The Ayurvedic diet and lifestyle treatment as mentioned above helps to regulate the *Agni*. The *Pranayamas* have helped in increasing the energy level by enhancing the *Agni* (metabolic activities) and *Prana* (bio energy) thus enhancing *Bala* (energy). The lifestyle schedule through *Asanas* relieves the accumulated *Kapha* and channelizes the *Vayu* properly.

In *Shrama Shwasa*, the results obtained were highly significant and significant in group A and group B, respectively. This was due to the effect of *Varadi Kwatha* in both the groups as it is *Tikta* (bitter) and *Kashaya Rasa* (astringent taste) predominantly with *Kaphaghna* property, which is expected to clear the *Pranavahasrotasas* (channels carrying the *prana*). The *Pranayama* in group A helps to strengthen the respiratory organs and *Vyayama* helps to systematically strengthen the body capacity; therefore, the result was highly significant in group A.

In the symptom *Shula*, the results obtained were significant and highly significant in group A and group B, respectively. In patients of *Madhumeha*, *Shula* occurs due to craving and lack of glucose entry to the body tissues. In this case, *Varadi Kwatha*, being predominantly *Tikta* and *Kashaya Rasa* and *Kaphagna* property is expected to clear the *srotasas* (channels) and facilitates the entry of glucose (nutrition) to generate *Bala* (vitality) and curbs *Shula* (tissue damage) and *Suptata*.

The results obtained were significant and highly significant in group A and group B, respectively, in *Alasya* with *Utsahahani* because the *Tikta* and *Kashaya Rasa* with *Laghu* and *Ruksha Gunas* of *Varadi Kwatha* in both the groups relieve the accumulated *Kapha*, channelize the *Vayu* properly, and rectify the *Alasya* of whole body and mind. The lifestyle program including *Asanas*, *Pranayama*, and listening to *Mantras* helped in regaining the physical, mental, and spiritual health of the patients in group A.

In *Purishabadhdata*, the results obtained were significant and highly significant in group A and group B, respectively, as *Haritaki* in *Varadi Kwatha* has *Anulomanaka* nature, thus facilitating the bowel evacuation.

Table 1: Special plan of Ayurvedic diet and lifestyle

Time	Events
Morning:	*Brahma Muhurta Jagarana*
5:30-6:00 a.m.	(wake up before sunrise)
	Ushahpana (drink warm water) 600 ml
	Shaucha Vidhi (passing urine, stool, and face wash) *Dantadhavana* (teeth cleansing)
6:00-7:00 a.m.	*Vyayama* (exercises) *Padagamana* (walking) *Yoga Devaprarthana* (prayer)
7:00-7:25 a.m.	*Snana* (bath)
7:25-7:45 a.m.	*Alpahara*: (light breakfast) as per *Agni Bala* *Yusha* (soup) and *Anna* or *Shaka* or *Phala*
7:45-11:45 a.m.	Routine work
11:45-12:00 p.m.	*Hastapada Prakshalana* (freshen up)
Noon:	*Laghu bhojana* as per *Agni Bala*
12:00-12:30 p.m.	*Annavarga*
	Java (barley)-*Hordeum vulgare*
	Godhuma (wheat)-*Triticum sativum*
	Shali shashtika (rice)-*Oryza sativa*
	Kulattha (horse gram)-*Dolichos biflorus*
	Mudga (green gram)-*Phaseolus aureus*
	Chanaka (bengal gram)-*Cicer arietinum*
	Adhaki (toor dal)-*Cajanus cajan*
	Sarshapa Taila (mustard oil)-*Brassica juncea*
	Saktu (powdered pulses)
	Shakavarga Tiktashaka
	Patola (pointed gourd)-*Trisanthus dioica*
	Methika (fenugreek)-*Trigonella foenum*
	Karvellaka (bitter gourd)-*Momordica charantia*
	Phalvarga
	Jambu (jamun)-*Eugenia jambolana*
	Dadima (pomegranate)-*Punica granatum*
	Amalaki (emblic myrobalan)-*Emblica officinalis*
	Kapittha (monkey fruit)-*Limonia acidissima*
	Shuskaanna/*Laja* include
	Dhani (popcorn of jowar)
	Daliya (roasted bengal gram)
	Mamara (puffed rice)
	Maricha (*Piper nigrum*)
	Saindhava (rocksalt)
	Hingoo (asafoetida)
12:30-12:45 p.m.	*Upavishana* in *Vajrasana*
Afternoon:	*Phalavarga*
4:30 p.m.	*Amalaki, Dadima* or *Jambu* or *Yusha* (steam boiled soup)
Evening:	Dinner-*Anna* (after taking *Snana*) as per
7:00 p.m.	*Agni bala*
	Anna (*Laghu Khichdi,* etc.)
	Shaka (simple cooked vegetables)
	Yusha (vegetable soup)

Contd...

Table 1: Contd...

Time	Events
	Then 100 steps *Padagamanama* (leisure walking)
9:30 p.m.	*Prarthana* (prayer)
	Yoga-Dhyana (meditation with relaxation)
10:00 p.m.	*Nidra* (bed time)
Apatarpana (*Upvasa*/fasting)	Once a week for 12 h from 6:00 a.m. to 6:00 p.m. and in the evening have a light *Anna* (e.g., light *Khichadi*)
Mantra/Nada	Along with the format of diet and lifestyle as per the control group, the patients in this group shall be allocated to the audition of Raga "*Vrindavani Saranga*" on sarod by Ustad Ali Akbar Khan at noon once a day (20 min). For morning relaxation, they shall be subjected to *Raga Bilawal* on shehnai by Ustad Bismillah khan and in the evening to *Raga Bhimpalasee* on sitar

Table 2: Ingredients of *Varadi Kwatha*

Sanskrit name	Botanical name	Part used	Proportion
Vatsaka	*Holarrhena antidysenterica*	Stem bark	1 part
Haritaki	*Terminalia chebula*	Pericarp	1/3 part
Amalaki	*Emblica officinalis*	Pericarp	1/3 part
Vibhitaki	*Terminalia belerica*	Pericarp	1/3 part
Darvi	*Coscinium fenestratum*	Stem	1 part
Mustaka (Nagarmotha)	*Cyperus rotundus*	Rhizome	1 part
Beejaka	*Pterocarpus marsupium*	Heart wood	1 part

In group A, the extra treatment through Ayurvedic diet and lifestyle treatment relieved the accumulated *Kapha*, rectified *Guruta* and *Snigdhata*, and channelized the *Vayu* properly with enhancement in *Agni Bala*, and therefore, significant results were obtained in HDL cholesterol, while in group B, the result was insignificant.

The effect on HbA1c in group A was statistically significant ($P < 0.05$) as the treatment techniques through lifestyle changes like *Padagamanama*, exercises, *Asanas*, fasting, etc., and the selected diet plan helped to enhance blood circulation and the metabolism of glucose, while in group B, this test was not done.

In group B, the results obtained in the symptoms like *Daurblaya*, *Shrama Shwasa*, *Shula*, *Alasya* with *Utsahahani* were highly significant as compared to the results observed in group A due to more number of patients.

Conclusion

The specially prepared Ayurvedic diet and lifestyle plan in the present study has all the potential to be used as a standard

Table 3: Effect of therapy on symptoms of *Madhumeha* in Group A

Symptoms	*n*	BT	AT	%	SD	SE	*t*	*P*
Prabhuta Mutrata	5	1.8	0	100	0.45	0.2	9.00	<0.001
Avila Mutrata	5	1.0	0	100	0	0	-	-
Pipasadhikya	3	1.67	0	100	0.58	0.33	5.0	<0.05
Kshudhadhikya/Mahashanama	5	0.8	0	100	o.89	0.4	4.0	<0.05
Abhyavarana Shakti	5	0.8	0	100	0.89	0.4	4.0	<0.05
Pindikoveshtena	3	1.33	0.33	75	0	0	-	-
Karapadatala Daha	1	0	1	-	-	-	-	-
Karapadatala Suptata	3	2.0	0.67	66.67	0.58	0.33	4.0	>0.05
Swedadhikya	2	2	0.5	75	0.71	0.5	3.0	>0.01
Gala Talu Shosha	3	1.66	0	100	5.78	0.33	5	<0.05
Daurbalya	4	1.75	0.25	85.71	6.58	0.29	5.19	<0.05
Shrama shwasa	3	1.67	0	100	0.58	0.33	5.0	<0.05
Shula	4	1.5	0.25	83.33	0.5	0.25	5.0	<0.05
Alasya/Utsahahani	4	1.5	0	100	0.58	0.29	5.19	<0.05
Klaibya	5	2	0.2	90	0.84	0.37	4.81	<0.01
Nidradhikya	1	2	1	50	-	-	-	-
Purishabaddhata	3	2.33	0	100	0.58	0.33	7	<0.05

AT: After treatment, BT: Before treatment, HS: Highly significant, SI: Significant, IS: Insignificant, SD: Standard deviation

Table 4: Effect of therapy on symptoms of *Madhumeha* in group B

Symptoms	*n*	BT	AT	%	SD	SE	*t*	*P*
Prabhuta Mutrata	17	1.82	0.35	80.65	0.62	0.18	9.71	<0.001
Avila Mutrata	15	1.4	0.2	85.71	0.77	0.20	6.00	<0.001
Pipasadhikya	19	2.68	0.42	84.31	0.93	0.21	10.56	<0.001
Kshudhadhikya/Mahashanama	16	0.25	0	100	1.57	0.39	0.63	>0.10
Abhyavarana Shakti	15	0.53	0	100	1.45	0.37	1.41	>0.01
Pindikoveshtena	17	2.05	0.52	71.42	0.79	0.19	7.58	<0.001
Karapadatala Daha	12	2.00	0.5	75.00	0.52	0.15	9.94	<0.001
Karapadatala Suptata	17	1.88	0.35	81.25	0.79	0.19	7.88	<0.001
Swedadhikya	17	2.17	0.29	86.48	0.99	0.24	7.81	<0.001
Gala Talu Shosha	15	1.66	0.33	76.00	0.96	0.24	5.10	<0.001
Daurbalya	22	2.09	0.40	78.26	0.90	0.19	8.50	<0.001
shrama shwasa	8	1.62	0.37	76.92	0.46	0.16	7.63	<0.001
Shula	15	2.06	0.53	74.19	0.91	0.23	6.48	<0.001
Alasya/Utsahahani	21	2.42	0.38	84.31	0.80	0.17	11.66	<0.001
Klaibya	21	2.14	0.66	75.55	0.80	0.17	9.21	<0.001
Nidradhikya	13	1.61	0.23	85.71	1.19	0.33	4.18	<0.10
Purishabaddhata	9	1.77	0	100	0.83	0.27	6.4	<0.001

AT: After treatment, BT: Before treatment, HS: Highly significant, SI: Significant, IS: Insignificant, SD: Standard deviation

Table 5: Effect of therapy on biochemical parameters in group A

Parameters	*n*	BT	AT	%	SD	SE	*t*	*P*
Fasting blood sugar level	6	217	147.3	32.10	57.62	23.52	2.96	<0.05
Postprandial blood sugar level	6	291.16	197.33	32.22	84.79	34.61	2.71	<0.05
Fasting urine sugar	4	2.75	0.87	77.27	1.25	0.62	3.4	<0.05
Serum triglyceride	6	213.83	213.17	0.31	73.65	30.06	0.02	>0.10
Serum cholesterol	6	191.67	179	6.60	18	7.35	1.72	>0.10
High density lipoprotein	6	43	36.85	14.34	5.49	2.24	2.75	<0.05
Serum creatinine	6	0.98	0.98	0	0.08	0.03	0	<0.10
Low density lipoprotein	6	105.9	99.53	6.01	11.16	4.58	1.40	<0.10
Very low density lipoprotein	6	42.77	42.63	0.31	14.73	6.01	0.62	<0.10
HbA1c	6	9.8	7.48	23.2	2.04	0.83	2.78	<0.05

AT: After treatment, BT: Before treatment, HS: Highly significant, SI: Significant, IS: Insignificant, SD: Standard deviation

Table 6: Effect of therapy on biochemical parameters in group B

Parameters	*n*	BT	AT	%	SD	SE	*t*	*P*
Fasting blood sugar level	24	205.62	161.79	21.31	41.39	8.44	5.18	<0.001
Postprandial blood sugar level	24	276.04	223.70	18.95	80.13	16.35	3.19	<0.01
Fasting urine sugar	13	2.38	1.23	48.38	2.07	0.57	2.00	>0.05
Serum triglyceride	24	185.54	154.12	17.42	71.27	14.54	2.22	<0.05
Serum cholesterol	24	199.16	189.29	6.61	26.99	5.51	2.38	<0.05
High density lipoprotein	24	37.70	37.41	0.77	7.08	1.44	0.20	>0.10
Serum creatinine	24	1.03	1.00	2.41	0.12	0.02	0.94	>0.10
Low density lipoprotein	24	124.33	117.15	5.77	22.98	4.69	1.52	>0.10
Very low density lipoprotein	24	37.10	30.67	20.75	13.95	2.84	2.70	<0.02

AT: After treatment, BT: Before treatment, HS: Highly significant, SI: Significant, IS: Insignificant, SD: Standard deviation

Table 7: Overall effect of therapies

Criteria	Group A (*n*=6)		Group B (*n*=24)	
	No. of patients	%	No. of patients	%
Moderately improved	4	66.67	17	70.83
Mildly improved	1	16.67	6	25
No improvement	1	16.66	1	4.17

Ayurvedic model protocol for *Madhumeha* (DM) patients. According to the effect of therapy, *Varadi Kwatha* with Ayurvedic *Ahara* and *Vihara* (group A) has proved to be a better remedy than only *Varadi Kwatha* (group B) by relieving most of the cardinal symptoms as well as improving the biochemical parameters. Thus, it can be used to help to correct the condition of *Madhumeha* (DM). The effect of Ayurvedic diet and lifestyle plan along with *Varadi Kwatha* can be further studied on a large number of patients to substantiate the results of the present study.

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हिन्दी सारांश

आहार – विहार का प्रभाव, मधुमेह चिकित्सा के परिप्रेक्ष्य में ।

ज्ञानेश्वरसिंह गुदोय, महेश व्यास

वर्तमान में आहार और विहार के नियमों के साथ मधुमेह की चिकित्सा पर कम ध्यान दिया जा रहा है । प्रायः सब लोग स्वस्थ आहार विहार, जानते है पर आचरण में नहीं अपनाते । इस आहार विहार और औषधी की धारा को और लोकप्रिय करने के लिए यह शोध कार्य किया गया है। इस शोध कार्य में ३० मधुमेह रुग्णों को लिया गया था, जिनको २ विभागों में बाँटा गया । समुह १ आहार विहार और वरादि क्वाथ, जिसमें ६६.६७% परिणाम मिला और समूह २ मे सिर्फ वरादि क्वाथ था जिसमें ७०.८३% फल मिला । चिकित्सा प्रयोग रोगियों को २ महिने तक करवाया गया । समूह दो (छ=२४) वरादि क्वाथ का अच्छा परिणाम मिला और बहुत अच्छे लक्षणिक लाभ भी मीले, समूह १ की संख्या (छ=६) जो की छोटी है और भविष्य में इसमें अच्छा परिणाम मिलने की संभावना है अतःइस पर और कार्य करने की आवश्यकता है ।