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Evaluate the efficacy of comparative study of *Aavapa Dravya Triovasti* and *Somavalkala Kashaya Yogabasti* in *Madhumeha* (NIDDM)

Dr. Suresh Hakkandi[1], Dr. Manjunath Akki[2]

[1]Principal Investigator, Professor & HOD, [2]Co-Principal Investigator, Professor, Dept. of Panchakarma, S J G Ayurvedic Medical College, Koppal, Karnataka, INDIA.

ABSTRACT

Background: *Madhumeha* has become a burning issue in day today life. The term *Prameha* has broader connotations indicating the increased quantity and quality of urination. Where as *Madhumeha*, is the condition where patient passes urine like honey. *Madhumeha* vis-à-vis Diabetes mellitus is a group of metabolic disorder characterized by Hyperglycaemia resulting from defects in Insulin secretion or its Action. In classics the prime importance has been given to *Basti* among *Panchakarma* and even termed as *Ardhachikitsa* or complete *Chikitsa*, as it produces multi-dimensional effect. **Objectives:** To evaluate the efficacy of the *Vasti* in Trio-vasti pattern and also to evaluate the efficacy of the *Avapadravya* in *Vasti* in Madhumeha, Methodology: 30 patients were selected for the study and equally divided in three groups. Group-A: 10 patients received *Somavalka Kashaya Niruha Yoga Basti.* Group-B: 10 patients received *Somavalka Kashaya* with *Aavapa Dravya Niruha Yoga Basti.* Group-C: 10 patients received *Somavalka Kashaya Niruha Yoga Basti* in Trio-vasti pattern. **Results and Conclusion:** After proper administration of *Somavalka Kashaya Yogabasti* in all the groups the results were noted that, it gives immediate and lasting results, both symptomatically and in sugar levels. Among 30 patients, 7 patients (23.33%) showed mild response, 12 Patients (40%) showed moderate response, 11 patients (36.66%) showed marked response. In mild and moderate type of *Madhumeha* patients, *Somavalka Kashaya* given in Trio-*Basti* helps to control it. Along with *Bastikarma*, administration of *Patya Aahara- Vihara* and *Shamanoushadis* may give better effect.

Key words: *Samshodhana, Madhumeha, Diabetes mellitus, Aavapa dravya Basti, Trio-vasti.*

INTRODUCTION

Madhumeha finds a strong co-relation and similarity with Diabetes Mellitus. *Madhumeha* vis-à-vis Diabetes mellitus is a group of metabolic disorder characterized by Hyperglycaemia resulting from defects in Insulin secretion or its Action.[1] *Charaka, Sushruta, Vagbhata* and other *Acharyas* mentioned *Apatarpana Chikitsa* for *Sthoola* and *Balavan Pramehi*.[2],[3]

In classics the prime importance has been given to *Basti* among *Panchakarma* and even termed as *Ardhachikitsa* or complete *Chikitsa*, as it produces multi-dimensional effect. It is mainly indicated in *Vataja, Pittaja, Kaphaja, Raktaja, Dwidoshaja, Tri-doshaja* and also in *Aavaranajanya Rogas*.[4] *Basti* is prepared with specific combination of drugs or a drugs to a particular disease, it acts soon and does easy evacuation of *Malas*, produces *Apatarpana, Tarpana, Rokshana, Balya, Vrishya, Rasayana* etc. With these qualities it is said that it is superior to other *Shodhana* therapies.[5],[6] *Charaka's* concept of *Aavapa Dravya* and its importance in the preparation

Address for correspondence:
Dr. Suresh Hakkandi
Principal Investigator, Professor & HOD,
Dept. of Panchakarma, S J G Ayurvedic Medical College, Koppal, Karnataka, INDIA.
E-mail: sureshhakkandi@gmail.com
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of *Vasti* is remarkable.[7] *Sushruta* has dealt the concept of Trio-Vasti i.e. *Dosha Utkleshana, Doshahara* and *Doshashamana* and suggests following this pattern to achieve proper effect of *Vasti* in eliminating *Dosha* and to subside a disease by one's own intellect.[8]

Charaka has indicated *Somavalka* (Vit *khadira*) *Niruha* in *Prameha* (*Madhumeha*).[9] Numbers of research works have already been conducted on *Madhumeha*. It is one of the multi systemic disorders where the maximum numbers of *Srotas* involved. So treating such disease with some time tested and effective therapies like *Vasti* is the better option.

OBJECTIVES

1. To evaluate the efficacy of the Vasti in Trio-vasti pattern.
2. To evaluate the efficacy of the Avapadravya in Vasti in *Madhumeha*

MATERIALS AND METHODS

Study design: It's a Comparative clinical trial.

Source of Data: Patients suffering from *Madhumeha* were selected from *Panchakarma* O.P.D. of S.J.G. Ayurvedic Medical College and Hospital, Koppal by preset inclusion and exclusion criteria.

Sample Size and Grouping: A Minimum of 30 patients were selected for the study and equally divided in three groups.

Group-A: 10 patients were received *Somavalka Kashaya Niruha Yoga Basti*.

Group-B: 10 patients were received *Somavalka Kashaya* with Aavapa dravya *Niruha Yoga Basti*.

Group-C: 10 patients were received *Somavalka Kashaya Niruha Yoga Basti* in Trio-vasti pattern.

Diagnostic Criteria: The diagnosis of the disease *Madhumeha* was made according to signs and symptoms mentioned in Ayurvedic and Modern texts.

Exclusion Criteria

1. Age below 30 Years and Above 60 Years
2. Insulin Dependent
3. Hypertensive
4. Ischemic heart disease Patients
5. Diabetic Ketoacidosis
6. Other Systemic Disorders
7. Non-diabetic Glycosuria.
8. Gestational Diabetes Mellitus
9. Patients with Severe Diabetic complications.

Inclusive Criteria

1. *Madhumeha* patients of classical signs and symptoms
2. Irrespective of Gender bias
3. Fasting blood sugar more than 110 mg/dl to 250 mg/dl
4. Post prandial blood sugar more than 140 mg/dl to 300mg/dl

Plan of study

Shodhana (*Basti*) therapy was divided into *Poorvakarma*, *Pradhanakarma* and *Paschatkarma*.

***Poorvakarma*:** For all the 3 Groups

- *Deepana* / *Pachana* for 3 days
- *Mridu Anulomana* for 1 day.
- *Shtanika Snehana* and *Shtanika Swedana* done as a *Tatkaleena Purvakarma* for all the patients.
- *Laghu Bhojana* was advised before administration of *Anuvasana*.
- *Niruha Basti* was administered in empty stomach

Pradhana Karma

Group-A: Patients received *Somavalka Kashaya Yoga Basti* after assessing the status of patient's *Koshta, Bala,* etc. which includes 5 *Somavalka Taila Anuvasana* and 3 *Somavalka Kashaya Niruha*.

Group-B: Patients received *Somavalka* plus *Aavapa Dravya Kashaya Yoga Basti* after assessing the status of patient's *Koshta, Bala,* etc. which includes 5

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Somavalka Taila Anuvasana and 3 *Somavalka* plus *Aavapa Dravya Kashaya Niruha.*

Group-C: Patients received *Somavalkakashaya Yoga Basti* in Trio-vasti pattern after assessing the status of patient's *Koshta, Bala,* etc. which includes 5 *Somavalka Taila Anuvasana* and 3 *Niruha* which includles first *Niruha* with *Somavalka* plus *Yastimadhu* and *Kapitta Kashaya*. Second *Niruha* with *Somavalka* plus *Karavellaka* and *Nimba Kashaya*, third *Niruha* with *Somavalka* plus *Saptachakra* and *Jambu Kashaya*.

Group A

Days	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day
Basti Dravya	A	N	A	N	A	N	A	A

- A = *Anuvasana* with *Somavalakala Taila* - 75ml
- N = *Niruha* with *Somavalakala Kashaya*

Niruha Vasti Dravyas & *Basti* Dosage

Makshika	120ml
Lavana	12gms
Sneha	100ml
Kalka	15gms
Somavalka Kashaya	500ml
Total quantity	720ml

Group B

Days	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day
Basti Dravya	A	N	A	N	A	N	A	A

- A = *Anuvasana* with *Somavalakala Taila* 75ml
- N = *Niruha* with *Somavalakala Kashaya* + *Avapa Dravyas* (*Amalaki* 10gms & *Haridra* 10gms)

Makshika	120ml
Lavana	12gms
Sneha	100ml
Kalka	15gms
Kashaya	500ml
Avapa Dravyas	20gms
Total quantity	720ml

Group C

Days	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day
Basti Dravya	A	N	A	N	A	N	A	A

- A = *Anuvasana* with *Somavalakala Taila* 75ml
- Dosage of 3 *Niruha Bastis* administered in following manner.

1st *Niruha*		**2nd *Niruha***		**3rd *Niruha***	
Makshika	120ml	*Makshika*	120ml	*Makshika*	120ml
Lavana	12gms	*Lavana*	12gms	*Lavana*	12gms
Sneha	100ml	*Sneha*	100ml	*Sneha*	100ml
Kalka	15gms	*Kalka*	15gms	*Kalka*	15gms
Kashaya	300ml	*Kashaya*	300ml	*Kashaya*	300ml
Yashtimadhu Kashaya	150ml	*Nimbi Kashaya*	150ml	*Jambu Kashaya*	150ml
Kapittha Kashaya	150ml	*Karavellaka Kashaya*	150ml	*Saptachakra Kashaya*	150ml
Total quantity	820ml	Total quantity	820ml	Total quantity	820ml

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Paschat Karma: *Patya Ahara- Vihara*

Follow-up : 16 days (*Parihara Kala*).

Study Duration: 12 days Treatment + 16 days follow up = Total 28 days

Investigations: FBS, PPBS, FUS, PPUS.

Subjective Parameters

1. *Prabhoota Mootrata*
2. *Avila Mootrata*
3. *Alasya*
4. *Pipasadhikya*
5. *Kara-Pada Daha* and *Suptata*
6. *Ati Sweda*
7. *Gurugatrata*
8. *Dourbalya*

Objective Parameters

Blood : FBS, PPBS.

Urine : Urine sugar (Fasting and Post Prandial).

SN	Level	FBS	PPBS	Urine sugar
1.	Normal	70-120 mg/dl.	120-180 mg/dl	Nil
2.	Mild	121-170 mg/dl	181-230 mg/dl	0.5%
3.	Moderate	171-220 mg/dl	231-280 mg/dl	1.0-1.5 %
4.	Severe	221- mg/dl and above	281 mg/dl and above	2% and above

Method of assessment of grading

The assessment of results was assessed by observing the severity of symptoms, as well as the laboratory investigations.

Gradings of subjective parameters

1. Prabhuta Mootrata

Frequency

Grade 0 - 2-3 times/day; 1 times/night

Grade 1 - 4-6 times/day; 2 times/night

Grade 2 - 7-9 times/day; 3-4times/night

Grade 3 - 10 times/day; >5times/night

2. Avila Mootrata

Grade 0 - Clear

Grade 1 - Milky white

Grade 2 - Buffy

Grade 3 - More turbidity

3. Kara Pada Daha

Grade 0 - No kara padadadha

Grade 1- Occasionally noticed

Grade 2 - Periodically noticed

Grade 3 - Daily noticed

4. Aalasya

Grade 0 - No Aalasya

Grade 1 - Mild increased but tolerated

Grade 2 - Moderate increased but tolerated

Grade 3 - Severally increased but not tolerated

5. Pipasa

Grade 0 : Normal

Grade 1 : Mild increased but tolerated

Grade 2 : Moderate increased but tolerated

Grade 3 : Severally increased but not Tolerated

6. Atisweda

Grade 0 : Normal sweating after doing normal physical activities

Grade 1 : Moderate sweating

Grade 2 : Excessive sweating

Grade 3 : Excessive sweating just by doing little work

7. Dourbalya

Grade 0 : No Dourbalya

Grade 1 : Occasionally noticed but not periodically

Grade 2 : Periodically noticed

Grade 3 : Continuously noticed

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8. Gurugatrata

Grade 0 : No Gurugatrata

Grade 1 : Occasionally noticed but not periodically

Grade 2 : Periodically noticed

Grade 3 : Continuously noticed

Gradings for objective parameters

Blood Sugar

Grades	Fasting	Post-prandial
Grade **0**	<110 mg%	<140 mg%
Grade 1	111 – 145 mg%	141 – 180 mg%
Grade 2	146 – 180 mg%	181 – 220 mg%
Grade 3	181- 215 mg%	221 – 260 mg%
Grade 4	216 – 250 mg%	261 – 300 mg%

Urine Sugar

Grade 0	Nil
Grade 1	0.5%
Grade 2	01%
Grade 3	1.5%
Grade 4	02%

OBSERVATIONS

Among 30 patients 17 (56.6%) were Males and 13 patients (43.3%) were Female. Among 30 Patients 28 (93.3%) were Hindus and 2 (6.6%) Patients were Muslims. Among 30 Patients 10 (33.33%) had Present 20 (66.66%) Patients had Absent Family History. Among 30 patients 18 (60%) were Vegitarian and 12 patients (40%) were Female. Among 30 patients 6 (20%) had sound sleep and 24 patients (80%) had Disturbed sleep. Among 30 Patients 6 (20%) were having *Vatapitta*, 16 (53.3%) were having *Vatakapha*, 4 (13.3%) were having *Pittakapha* and 4 (13.3%) were having *Sama Prakruti*. Among 30 Patients 10 (33.3%) Patients had 1-2 years, 12 (40%) Patients had 2-5 years, 8 Among 30 Patients 5 (16.6%) were *Samagni*, 3(3%) were *Vishamagni*, 12(40%) were Teekshagni, 10 were having *Mandagni*. Among 30 Patients 4 (13.3%) were Mridu, 20 (66.6%) were *Madyama*, 6 (20%) were *Krura Koshta*. Among 30 Patients 3 (10%) were *Pravara*, 20 (66.6%) were *Madhyama*, 7 (23.3%) were *Avara Sara.* Among 30 Patients 4 (13.3%) were *Pravara*, 16 (53.3%) were *Madhyama*, 10 (33.3%) were *Avara Samhanana*. Among 30 Patients 20 (66.6%) were *Pravara*, 10 (33.3%) were *Madhyama Satmya*. Among 30 Patients 12 (40%) were *Pravara*, 7 (23.3%) were *Madhyama*, 11 (36.6%) were *Avara Satwa*. Among 30 Patients 18 (60%) were *Pravara*, 10 (33.3%) were *Madhyama*, 2 (6.6%) Patients were having *Avara Abhyavaranashakti*. Among 30 Patients 18(60%) were *Pravara*, 8(26.6%) were *Madhyama*, 4 (13.3%) Patients were having *Avara Jaranashakti*. Among 30 Patients 3 (10%) were *Pravara*, 19 (63.3%) were *Madhyama*, 8 (26.6%) Patients were having *Avara Vyayamashakti*. Among 30 Patients 3 (10%) were having *Upadrava* and 27 (90%) were not having *Upadrava*.

In symptom *Prabhuta Mutrata*, all the patients of all 3 Groups showed Highly Significant response (as P<0.001) after the Treatment and Significant after the Follow-up period as the P value is <0.01.

In symptom *Avila Mutrata*, all the patients of all 3 Groups showed Insignificant response as P>0.05 after the Treatment and even after the Follow-up period also, as the P value is >0.05.

In symptom *Kara Pada Daha* and *Suptata*, all the patients of all 3 Groups showed Significant response (P<0.01) after the Treatment and Moderate significance after the Follow-up period, as the P value is <0.05.

In symptom Alasya, all the patients of all 3 Groups showed Insignificant response (P>0.05) after the Treatment and Moderate response after the Follow-up period, as the P value is <0.05.

In symptom *Pipasadhikya*, all the patients of all 3 Groups showed Significant response after the Treatment and even after the Follow-up period also, as the P value is <0.01

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In symptom *Atisweda*, all the patients of all 3 Groups showed Insignificant response after the Treatment and even after the Follow-up period also, as the P value is >0.05.

In symptom *Dourbalya*, all the patients of all 3 Groups showed Insignificant response after the Treatment and even after the Follow-up period also, as the P value is >0.05.

In symptom *Gurugatrata*, all the patients of all 3 Groups showed Insignificant response after the Treatment and even after the Follow-up period also, as the P value is >0.05.

Table 1: *Prabhuta Mutrata* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	1.6	0.516	0.163	21.50	2	15.08	<0.001	HS
	Group-B	10	1.2	0.789	0.249	17.50				
	Group-C	10	0.2	0.422	0.133	7.50				
	Total	30	1.0	0.830	0.152	-				
After Follow-up	Group-A	10	1.9	0.568	0.180	21.45	2	11.07	<0.01	S
	Group-B	10	1.4	0.516	0.163	15.40				
	Group-C	10	0.9	0.568	0.180	9.65				
	Total	30	1.4	0.675	0.123	-				

Table 2: *Avila Mutrata* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	0.6	0.843	0.267	18.30	2	3.02	>0.05	IS
	Group-B	10	0.2	0.422	0.133	14.80				
	Group-C	10	0.1	0.316	0.100	13.40				
	Total	30	0.3	0.596	0.109	-				
After Follow-up	Group-A	10	0.8	1.135	0.359	17.60	2	1.60	>0.05	IS
	Group-B	10	0.4	0.699	0.221	15.30				
	Group-C	10	0.2	0.422	0.133	13.60				
	Total	30	0.5	0.819	0.150	-				

Table 3: *Kara Pada Daha / Suptata* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	1.0	0.471	0.149	20.00	2	10.12	<0.01	S

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	Group-B	10	0.8	0.632	0.200	17.20				
	Group-C	10	0.2	0.422	0.133	9.30				
	Total	30	0.7	0.606	0.111	-				
After Follow-up	Group-A	10	1.4	0.699	0.221	20.85	2	8.57	<0.05	MS
	Group-B	10	0.9	0.738	0.233	15.55				
	Group-C	10	0.4	0.516	0.163	10.10				
	Total	30	0.9	0.759	0.139	-				

Table 4: *Aalasya* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	0.2	0.422	0.133	17.50	2	4.14	>0.05	IS
	Group-B	10	0.0	0.000	0.000	14.50				
	Group-C	10	0.0	0.000	0.000	14.50				
	Total	30	0.1	0.254	0.046	-				
After Follow-up	Group-A	10	0.7	0.823	0.260	19.30	2	6.58	<0.05	MS
	Group-B	10	0.0	0.000	0.000	11.50				
	Group-C	10	0.3	0.483	0.153	15.70				
	Total	30	0.3	0.606	0.111	-				

Table 5: *Pipasadhikya* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	1.2	0.422	0.133	21.50	2	12.03	<0.01	S
	Group-B	10	0.7	0.483	0.153	15.30				
	Group-C	10	0.3	0.483	0.153	9.70				
	Total	30	0.7	0.583	0.106	-				
After Follow-up	Group-A	10	1.8	0.632	0.200	22.35	2	11.93	<0.01	S
	Group-B	10	1.0	0.667	0.211	13.80				
	Group-C	10	0.7	0.483	0.153	10.35				
	Total	30	1.2	0.747	0.136	-				

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Table 6: *Atisweda* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	0.9	0.876	0.277	17.70	2	1.38	>0.05	IS
	Group-B	10	0.5	0.707	0.224	13.50				
	Group-C	10	0.6	0.516	0.163	15.30				
	Total	30	0.7	0.711	0.130	-				
After Follow-up	Group-A	10	1.3	1.059	0.335	19.40	2	3.40	>0.05	IS
	Group-B	10	0.6	0.843	0.267	13.20				
	Group-C	10	0.6	0.516	0.163	13.90				
	Total	30	0.8	0.874	0.160	-				

Table 7: *Daurbalya* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	0.7	0.823	0.260	18.25	2	2.19	>0.05	IS
	Group-B	10	0.3	0.675	0.213	13.70				
	Group-C	10	0.3	0.483	0.153	14.55				
	Total	30	0.4	0.679	0.124	-				
After Follow-up	Group-A	10	0.9	0.876	0.277	19.45	2	4.43	>0.05	IS
	Group-B	10	0.4	0.699	0.221	14.45				
	Group-C	10	0.2	0.422	0.133	12.60				
	Total	30	0.5	0.731	0.133	-				

Table 8: *Gurugatrata* in Different Groups Comparisons.

Observations	Descriptives					Kruskal-Wallis H Test				
	Comparing Groups	n	Mean	±SD	±SE	Mean Rank	df	Chi-Square	P	Remarks
After Treatment	Group-A	10	0.4	0.699	0.221	16.70	2	0.51	>0.05	IS
	Group-B	10	0.2	0.422	0.133	14.90				
	Group-C	10	0.2	0.422	0.133	14.90				
	Total	30	0.3	0.521	0.095	-				
After Follow-up	Group-A	10	0.5	0.707	0.224	18.15	2	2.76	>0.05	IS

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	Group-B	10	0.1	0.3166	0.1000	13.45				
	Group-C	10	0.2	0.4222	0.1333	14.90				
	Total	30	0.3	0.5221	0.0955	-				

Table 9: Effect of therapy on FBS

Groups	**Samples Statistics**			**Paired Differences**				**Paired t-Test findings**		
Group-A	**Mean**		**Decrease in %**	**Comparative Pairs**	**n**	**±SD**	**±SE**	**t**	**P**	**Remarks**
	BT	203.3								
	AT	162.0	20%	BT-AT	10	14.10	4.446	9.27	<0.0001	HS
	AF	174.7	14%	BT-AF	10	22.57	7.14	4.01	<0.01	S
Group-B	**Mean**		**Decrease in %**	**Comparative Pairs**	**n**	**±SD**	**±SE**	**t**	**P**	**Remarks**
	BT	180.2								
	AT	135.5	25%	BT-AT	10	25.42	8.04	5.56	<0.0001	HS
	AF	148.5	18%	BT-AF	10	20.03	6.33	5.01	<0.0001	HS
Group-C	**Mean**		**Decrease in %**	**Comparative Pairs**	**n**	**±SD**	**±SE**	**t**	**P**	**Remarks**
	BT	180.1								
	AT	111.7	38%	BT-AT	10	21.70	6.866	9.97	<0.0001	HS
	AF	135.7	25%	BT-AF	10	18.71	5.92	7.50	<0.0001	HS

In symptom FBS, all the patients of all 3 Groups showed Highly significant response after the Treatment and even after the Follow-up period as the P value is <0.001, except in Group A – patients showed Significance results after the follow-up period as P is <0.01.

Table 10: FBS in Different Groups Comparisons

Observations	**Descriptives**					**ANOVA**						
	Comparing Groups	n	Mean	±SD	±SE	Variance	Sum of Squares	df	Mean Square	F	P	Remarks
After Treatment	**Group-A**	10	162.0	20.1	6.4	Between Groups	12662.6	2	6331.3	17.60	<0.01	S
	Group-B	10	135.5	22.1	7.0							
	Group-C	10	111.7	13.7	4.3	Within Groups	9712.6	27	359.7			
	Total	30	136.4	27.8	5.1							
After Follow-up	**Group-A**	10	174.7	26.5	8.4	Between Groups	7904.3	2	3952.1	9.10	<0.01	S
	Group-B	10	148.5	19.5	6.2							
	Group-C	10	135.7	14.9	4.7	Within Groups	11724.7	27	434.2			
	Total	30	153.	26.	4.							

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			0	0	8							

In symptom PPBS, Group-B and Group-C showed Highly significant response after the treatment and after the fallow-up period also as P<0.001, whereas in Group-A patients were had Highly significance after the treatment as P<0.001 and Significant after the fallow-up period as P<0.01.

Table 11: PPBS in Different Groups Comparisons

Observations	Descriptives					ANOVA						
	Comparing Groups	n	Mean	±SD	±SE	Variance	Sum of Squares	df	Mean Square	F	P	Remarks
After Treatment	Group-A	10	187.8	30.6	9.7	Between Groups	12223.4	2	6111.7	118.8	<0.01	S
	Group-B	10	164.9	19.7	6.2							
	Group-C	10	138.4	14.9	4.7	Within Groups	13886.9	27	514.3			
	Total	30	163.7	30.0	5.5							
After Follow-up	Group-A	10	209.7	21.8	6.9	Between Groups	16416.2	2	8208.1	200.1	<0.01	S
	Group-B	10	175.4	23.0	7.3							
	Group-C	10	152.8	15.0	4.8	Within Grou	11074.1	27	410.2			
	Total	30	179.3	30.8	5.6	ps						

In symptom PPBS, all the patients of all 3 Groups showed Significant response after the Treatment and even after the Follow-up period also as the P value is <0.01.

Table 12: Effect of therapy on FUS

Groups	Samples Statistics			Paired Differences				Paired t-Test findings		
	Mean		Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
Group-A	BT	1.25								
	AT	0.65	48%	BT-AT	10	0.394	0.125	4.81	<0.001	HS
	AF	0.90	28%	BT-AF	10	0.338	0.107	3.28	<0.01	S
Group-B	Mean		Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT	0.95								
	AT	0.25	74%	BT-AT	10	0.350	0.111	6.33	<0.001	HS
	AF	0.50	47%	BT-AF	10	0.438	0.138	3.25	<0.01	S
Group-C	Mean		Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT	0.75								
	AT	0.20	73%	BT-AT	10	0.284	0.090	6.13	<0.001	HS
	AF	0.20	73%	BT-AF	10	0.284	0.090	6.13	<0.001	HS

In symptom FUS, all the patients of all 3 Groups showed Highly significant response after the

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Treatment and even after the Follow-up period as the P value is <0.001, except in Group A and Group B– patients showed Significance results after the fallow-up period as P is <0.01.

Table 13: FUS in Different Groups Comparisons

Observations	Descriptives					ANOVA						
	Comparing Groups	n	Mean	±SD	±SE	Variance	Sum of Squares	df	Mean Square	F	P	Remarks
After Treatment	Group-A	10	0.65	0.338	0.107	Between Groups	1.217	2	0.608	5.97	<0.01	S
	Group-B	10	0.25	0.354	0.112							
	Group-C	10	0.20	0.258	0.082	Within Groups	2.750	27	0.102			
	Total	30	0.37	0.370	0.068							
After Follow-up	Group-A	10	0.90	0.211	0.067	Between Groups	2.467	2	1.233	16.65	<0.01	S
	Group-B	10	0.50	0.333	0.105							
	Group-C	10	0.20	0.258	0.082	Within Groups	2.000	27	0.074			
	Total	30	0.53	0.393	0.072							

Table 14: Effect of therapy on PPUS

Groups	Samples Statistics			Paired Differences				Paired t-Test findings		
	Mean		Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
Group-A	BT	1.35								
	AT	1.00	26%	BT-AT	10	0.242	0.076	4.58	<0.01	S
	AF	1.05	22%	BT-AF	10	0.258	0.082	3.67	<0.01	S
Group-B	Mean		Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT	0.90								
	AT	0.20	78%	BT-AT	10	0.422	0.133	5.25	<0.001	HS
	AF	0.35	61%	BT-AF	10	0.369	0.117	4.71	<0.01	S
Group-C	Mean		Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT	0.90								
	AT	0.15	83%	BT-AT	10	0.354	0.112	6.71	<0.001	HS
	AF	0.15	83%	BT-AF	10	0.354	0.112	6.71	<0.001	HS

In symptom PPUS, all the patients of Group-C showed Highly significant response after the Treatment and even after the Follow-up period as the P value is <0.001. Group-B showed Highly significant response after the Treatment as the P value is <0.001 and

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Significant response after the Follow-up period as the P value is <0.01. in Group A – patients showed Significance results after the treatment and even after the fallow-up period also as P is <0.01.

Table 15: PPUS in Different Groups Comparisons

Observations	Descriptives					ANOVA						
	Comparing Groups	n	Mean	±SD	±SE	Variance	Sum of Squares	df	Mean Square	F	P	Remarks
After Treatment	Group-A	10	1.000	0.4083	0.1291	Between Groups	4.5500	2	2.2750	23.400	<0.001	S
	Group-B	10	0.200	0.2582	0.0816							
	Group-C	10	0.150	0.2422	0.0766	Within Groups	2.6250	27	0.097			
	Total	30	0.450	0.4972	0.0911							
After Follow-up	Group-A	10	1.050	0.3669	0.1160	Between Groups	4.467	2	2.233	21.73	<0.001	S
	Group-B	10	0.350	0.3382	0.1070							
	Group-C	10	0.150	0.2422	0.0766	Within Groups	2.775	27	0.1033			
	Total	30	0.5200	0.5000	0.0911							

Table 16: Effect of therapy on HbA1c

Groups	Samples Statistics		Paired Differences				Paired t-Test findings		
Group-A	Mean	Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT 9.56								
	AF 9.43	1%	BT-AF	10	0.082	0.026	4.99	<0.001	HS
Group-B	Mean	Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT 9.46								
	AF 9.30	2%	BT-AF	10	0.151	0.048	3.36	<0.01	S
Group-C	Mean	Decrease in %	Comparative Pairs	n	±SD	±SE	t	P	Remarks
	BT 9.27								
	AF 8.77	5%	BT-AF	10	0.313	0.099	5.06	<0.001	HS

In symptom HbA1c, all the patients of Group-A and Group-C showed Highly significant response after the Follow-up period as the P value is <0.001. Group-B showed Significant response after the Follow-up period as the P value is <0.01.

Table 17: HbA1c in Different Groups Comparisons

Observations	Descriptives					ANOVA						
	Comparing Groups	n	Mean	±SD	±SE	Variance	Sum of Squares	df	Mean Square	F	P	Remarks
After Foll	Group-A	10	9.43	0.38	0.12	Between	2.445	2	1.22	10.3	<0.0	S

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ow-up				0	0	n Groups			2	7	1	
	Group-B	10	9.30	0.2663	0.0083							
	Group-C	10	8.787	0.3734	0.0118	Within Groups	3.182	27	0.0118			
	Total	30	9.117	0.4441	0.0080							

Discussion

The *Somavalka* has been selected for the study because of direct indication of *Somavalka Kashaya Niruhabasti* by *Charaka Samhita.* The study is framed to evaluate the comparative effect in 3 Groups and 30 patients were equally divided into three (i.e. 10 patients in each groups) groups. Here the *Somavalka Kashaya* is used in all three groups; with *Aavapa Dravyas* (*Amalaki*, *Haridra*) and with *Utklesh Dravyas* (*Yastimadhu*, *Kapitha*), *Doshahara Dravyas* (*Karavellka, Nimba*), *Dosha Shaman* (*Saptachakra*, *Jambu*) under Trio-vasti pattern for 8- days (*Yoga Basti* Schedule). The treatment given to 30 patients includes *Sthanika Abhyanga* with *Tilataila*, *Nadiswedana* locally and Basti for 8- days. In this particular context the patients of *Madhumeha* presented with the symptoms like *Prabhoota Mootrata, Aavila Mootrata, Pipasadikya, Kara-Padadaha* etc. and the aim was to control it, as *Madhumeha* is *Kaphapradhana Vatavyadhi* along with *Kleda* and *Meda*. *Somavalka* is having *Tikta, Kashaya* property and *Ushnavirya*, *Kapha-Vatahara* and *Pramehahara* property.

Similarly *Aavapa Dravyas* bears *Tikta, Kashaya Rasa, Ushnavirya* and are also having *Tridoshahara* (*Amalaki*), *Kapha- Vatahara*, and *Pramehahara* property.

Similarly *Yastimadu* is *Tridoshahara*, *Kapita* is *Usna Veerya* and having *Kapha-Vatahara* property. *Karavelleka* is *Tikta, Katu, Usna Veerya, Kapha-Pitta Hara* and *Pramehahara* property. *Nimba* is *Tikta*, *Kashaya, Usnavirya, Kapha-Pitta Hara* and *Madhumehahara* property. *Saptachakra* is *Tikta, Kashaya, Usnavirya, Kapha-Pitta Hara* and *Madhumehahara* property. *Jambu* is *Kashayapradhana* and *Madhumehahara* property.

In *Madhumeha*, *Vata* gets alleviated by *Basti* by removing the *Aavarana* done by *Kapha*. So along with *Vata*, morbid *Kapha* is also expelled out.

Conclusion

Somavalka Kashya Yogabasti has shown good result in *Madhumeha*. Among *Somavalka* with *Avapa Dravyas* and *Somavalka* used in trio-*Basti* along with *Utkleshana*, *Doshahara, Dosha Shaman*, the former has shown better result than the above treatment modality and later has shown very significant results than other two treatment modalities. Hence *Somavalka Kashaya* given in Trio-*Basti* pattern is an effective treatment in the management of *Madhumeha*. In mild and moderate type of *Madhumeha* patients, *Somavalka Kashaya* given in Trio-*Basti* helps in controlling it.

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