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# A Clinical Study to evaluate the therapeutic effect of *Akulyaabdadi Kashaya* in *Madhumeha* (Type-II Diabetes Mellitus)

**Pavitra Malik**

Assistant Professor, Dept. of Kayachikitsa, National College of Ayurveda, Barwala, Hisar, Haryana, India.

## ABSTRACT

**Introduction:** In 2024 approximately 540 million adults (20-70 years) are living with diabetes as per data of IDF (international diabetes Federation). WHO states that diabetes will be 7<sup>th</sup> leading cause of death by 2030. *Ayurveda* says *Madhumeha* is a variety of *Vataja Prameha* where the patient passes the urine with sweetness and astringency. The main symptoms involved are *Prabhoota Mootrata* (excessive urination) and *Avila-Mootrata* (non-transparency of urine). The major cause of disease is sedentary lifestyle and indulgence in *Kapha-Medakar Ahara* along with *Divaswapana* (day sleeping), avoidance of any form of exercise, hence indicating *Santarpanjanya* origin of disease. **Methods:** *Akulyaabdadi Kashaya*, the first *Kashaya* mentioned in *Pramehahara Kashayas* if *Sahasrayoga* is taken for single blind clinical study on 30 patients and the efficacy is established post 30-days of treatment. **Results:** During the study, it was found that signs and symptoms like polyuria, turbidity in urine, polyphagia, excessive thirst, burning sensation and numbness in feet, weakness, excessive sweating and lassitude were significantly reduced and *Akulyaabdadi Kashaya*, the trial drug was found highly significant at 0.1% level with p- value <0.001 to improve the FBS, PPBS, urine glucose (FUS & PPUS) and establishes it as a good treatment of Diabetes as a long term drug.

**Key words:** *Madhumeha, Akulyaabdadi Kashaya, Type-II Diabetes Mellitus*

## INTRODUCTION

*Prameha* is a disease which shows effects all over the body and specifically the urinary system. *Madhumeha* a variety of *Vataja Prameha* is one among the *Astamahagadas*,<sup>[1]</sup> in which the vitiation of *Vatakapha Pradhana Tridoshas* associate with *Medas* and other *Dhatu* along with *Ojas* reaches the *Mootravaha Srotas* and results in the illness.<sup>[2]</sup> Based on the pathology *Madhumeha* is of two types - *Dhatu Kshayaja* and *Avaranaja*. *Avaranjanya Madhumeha* is considered as *Krichrasadhya*.<sup>[3]</sup> *Madhumeha* vitiates all three *Doshas* and 10 - *Dushyas Meda, Rakta, Shukra, Ambu, Vasa,*

*Lasika*.<sup>[4]</sup> Vitiation of *Kapha* results in *Medadushti*, and it moves in downward direction through the *Mootravaha Srotas*, and gets *Sthanasamshraya* in *Basti* leading to *Prabhoota Mutrata, Avila Mutrata* etc. symptoms. In Diabetes Mellitus, reduced insulin secretion, decreased glucose utilization, and increased glucose production causes hyperglycemia. This dysregulates metabolic system, and causes pathophysiological changes in multiple organ systems, and imposes tremendous burden on health of an individual.

Type-II Diabetes Mellitus (NIDDM) is burning Health issue across the world in the near past and India leads the world with largest number of Diabetic subjects and being termed as diabetic capital of the world.<sup>[5]</sup> Globalization may be good for economy but is disastrous for civilization. Societies following modernized lifestyle and avoiding traditional system in diet, medicines and lifestyle are experiencing highest rates of diabetes mellitus.<sup>[6]</sup> The IDF reported 6.7 million deaths due to diabetes in 2021.<sup>[7]</sup> Despite all the modern advancements in hypoglycemic drugs, management of diabetes is still big challenge for medical world. The long-term use of hypoglycemic

### Address for correspondence:

**Dr. Pavitra Malik**

Assistant Professor, Dept. of Kayachikitsa, National College of Ayurveda, Barwala, Hisar, Haryana, India.

E-mail: drpavitrimalik@gmail.com

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drugs is accompanied by several adverse effects. Hence there is increasing need to go back to the roots i.e., *Ayurveda* and in this direction the Ministry of AYUSH has also launched “*The Mission Madhumeha*” on 28<sup>th</sup> October, 2016 on first *National Ayurveda Day*.

*Ayurvedic* texts, mention about effective treatment of *Madhumeha* which not only helps in reducing the blood sugar level but also improves overall health of the patient. *Akulyaabdadi Kashaya* is mentioned in *Prameha chikitsa, Kashaya Prakaran of Sahasrayoga*.<sup>[8]</sup>

In this current study an effort being made to provide a good oral hypoglycemic drug effective in improving the quality of life of diabetes patient. The trial drug *Akulyaabdadi Kashaya* was formulated as per the description in *Prameha Chikitsa, Kashaya Prakaran of Sahasrayoga*.<sup>[9]</sup> *Madhumeha* (Type-II Diabetes Mellitus). The aim is a good control and management of *Madhumeha*. And I found out that the individual components of the drug have already been scientifically evaluated in pharmacological sector, establishing their hypoglycemic effect. The study has been conducted on taking the number of cases for a trial period of 30 days. Has been used as a trial drug. All the clinical features, blood and urine values have been recorded pre and post the trial systematically and assessed with the help of suitable statistical parameter and is presently in form of charts and tables.

## AIM

To assess the therapeutic effect of *Akulyaabdadi Kashaya* in *Madhumeha* (Type-II Diabetes Mellitus).

## OBJECTIVE

1. To Study in detail about *Madhumeha* (Type-II Diabetes Mellitus).
2. Preparation of *Akulyaabdadi Kashaya* in accordance with textual reference.
3. To study the effect of *Akulyaabdadi Kashaya* in the management *Madhumeha* (Type-II Diabetes Mellitus).

**Hypothesis:** it is assumed that *Akulyaabdadi Kashaya* is an effective drug to control *Madhumeha* (Type-II Diabetes Mellitus).

## MATERIALS AND METHODS

### Design of the study

It is a single blind clinical study.

Total 30 patients were selected randomly Patients who are already on other anti-diabetic drugs were also taken in this study after discontinuing the treatment and after the wash out period of one week. A well-formed, printed chart given to the individuals indicating *Pathya* and *Apathya, Yogasana* according to the condition i.e., Type – II Diabetes Mellitus.

**Duration of the study:** 30 days. Assessment was done based on subjective and objective criteria before after the treatment i.e. on 0 day, 31st day.

**Ethical clearance:** the study has been conducted with the due approval of IEC, KAMC, Mangalore, Karnataka. The patients were given all the required information and signed consent was obtained before starting the trial.

### Criteria for selection of patients

#### Diagnostic criteria:

Patients fulfilling the following criteria:

#### Subjective criteria:

*Prabhuta Mutrata, Avila Mutrata, Pipasa, Kshudha, Kara-Pada-Tala Suptata/Daha, Swedadhikya, Daurbalya, Nidradhikya*

#### Objective criteria:

1. Fasting Blood Sugar (FBS):  $\geq 126\text{mg/dl}$  -  $\leq 250\text{mg/dl}$ . Fasting is defined as no caloric intake for at least 8 Hours
2. Post Prandial Blood Sugar (PPBS):  $\geq 140\text{mg/dl}$  -  $\leq 300\text{mg/dl}$ .
3. Raised Fasting Urine Sugar (FUS).
4. Raised Post Prandial Urine Sugar (PPUS).

#### Inclusion criteria:

1. Patients diagnosed to be suffering from Type-II Diabetes Mellitus or having classical signs and Symptoms of *Madhumeha*.

2. Diagnosed cases of Type-II Diabetes Mellitus within 5 years of onset.
3. Patients of either sex will be taken.
4. Both fresh & treated patients of age group between 30-70 years.
5. Patients of Diabetes Mellitus having
  - Fasting Blood Sugar:  $\geq 126\text{mg/dl}$  -  $\leq 250\text{mg/dl}$ .
  - Post Prandial Blood Sugar:  $\geq 140\text{mg/dl}$  -  $\leq 300\text{mg/dl}$  & raised urine sugar values.

**Exclusion criteria:**

1. Insulin Dependent Diabetes Mellitus (Type-1).
2. Patients of age group  $<30$  and  $>70$  years.
3. Any Systemic disorder other than Diabetes Mellitus which will interfere with present treatment.
4. Diabetic patients associated with severe complications such as Ischemic Heart
5. Disease, Diabetic retinopathy, Gestational Diabetes, PCOS.
6. Pregnant women.

**Assessment Criteria:**

Assessment was done based on subjective and objective criteria before after the treatment i.e., on 0 day, 31st day.

**Grading of subjective criteria:**

Criteria	Grading
<b>1. Prabhoota Mootrata (Polyuria) - Frequency of urine</b>	
3-5times/day & rarely at night	0
6-7 times/day & 1-2times at night	1
8-10 times/day & 3-4times at night	2
$>10$ times/day & $>4$ times at night	3
<b>2. Avila Mutrata (Turbidity in urine)</b>	
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
<b>3. Pipasa (Polydypsia)</b>	
Feeling of thirst 7 - 9 times/24 hours, either/or Intake of water 5 - 7 times/24 hours with quantity 1.5 - 2.0 liter/24 hours	0
Feeling of thirst 9 - 11 times/24 hours, either/or Intake of water 7 - 9 times/24 hours with quantity 2.0 - 2.50 liter/24 hours	1
Feeling of thirst 11 - 13 times/24 hours, either/or Intake of water 9 - 11 times/24 hours with quantity 2.50 - 3.00 liter/24 hours	2
Feeling of thirst $>13$ times/24 hours, either/or Intake of water $>11$ times/24 hours with quantity $>3.00$ liter/24 hours	3
<b>4. Kshudha-Adhikaya (Appetite)</b>	
As usual / routine	0
Slightly increased (1 - 2 meals)	1
Moderately increased (3 - 4 meals)	2
Markedly increased (5 - 6 meals)	3
<b>5. Kara - Pada - Tala Suptata / Daha (Neuropathy)</b>	
No Suptata / Daha	0
Kara - Pada - Tala Suptata/ Daha is continuous	1
Kara - Pada - Tala Suptata/ Daha continuous but not severe	2
Kara - Pada - Tala Suptata/ Daha continuous and severe	3
<b>6. Swedadhikya (Perspiration)</b>	
Sweating after some strenuous or heavy work or in hot & 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
<b>7. Daurbalya (Weakness)</b>	
Can do routine exercise/work	0
Can do moderate exercise with hesitancy	1
Can do mild exercise only, with difficulty	2
Cannot do mild exercise too	3
<b>8. Nidradhikya (Excessive Sleep)</b>	
Normal & sound sleep for 6 - 8 hrs. /24 hrs with feeling of lightness and relaxation in the body & mind	0
Sleep >8 - 9 hrs. /24 hrs with slight heaviness in the body.	1
Sleep >9 - 10 hrs. /24 hrs with heaviness in the body associated with <i>Jrimbha</i> .	2
Sleep >10 hrs. /24 hrs. with heaviness in the body associated with <i>Jrimbha</i> & <i>Tandra</i>	3

**Objective criteria: (American Diabetes Association)**

**Grading of Objective criteria**

<b>1.Fasting blood glucose (FBS)</b>	
<b>Criteria</b>	<b>Grading</b>
90 - 130 mg/dl	0
131 - 150 mg/dl	1
151 – 170 mg/dl	2
>171 mg/dl	3
<b>2. Post prandial blood glucose (PPBS)</b>	
140 - 180 mg/dl	0
181 - 220 mg/dl	1

221 - 260 mg/dl	2
>261 mg/dl	3
<b>3. Urine Glucose FUS &amp; PPUS (<i>Mutramadhuryata</i>)</b>	
Blue ppt.	0
Green ppt.	1
Yellow ppt.	2
Orange ppt.	3
Brick red ppt.	4

**Diagnostic investigations**

1. FBS
2. PPBS
3. Urine glucose FUS & PPUS

**Posology**

**1. Trial drug: Akulyaabdadi Kashaya**

The drug was provided in set of three

1. The coarse powder (*Kwatha Choorna*) of 1-24 drugs was packed in 500g quantity along with a measuring spoon of 5gm.
2. *Suddha Shilajatu* in powder form packed in 240 grams quantity
3. Honey purchased from market

The *Kwatha Churna* was boiled with 200 ml of water and reduced to 50 ml. in the prepared *Kwatha Suddha Shilajatu* powder and honey was added using measuring spoon.

**Dose:** 48ml BD before food

**Diet and exercise**

A well-formed, printed chart given to the individuals indicating *Pathya* and *Apathya*, *Yogasana* according to the condition i.e., Type – II Diabetes Mellitus.

**Design of the study:**

It is a single blind clinical study.

Total 30 patients were selected randomly Patients who are already on other anti-diabetic drugs were also taken in this study after discontinuing the treatment and after the wash out period of one week.

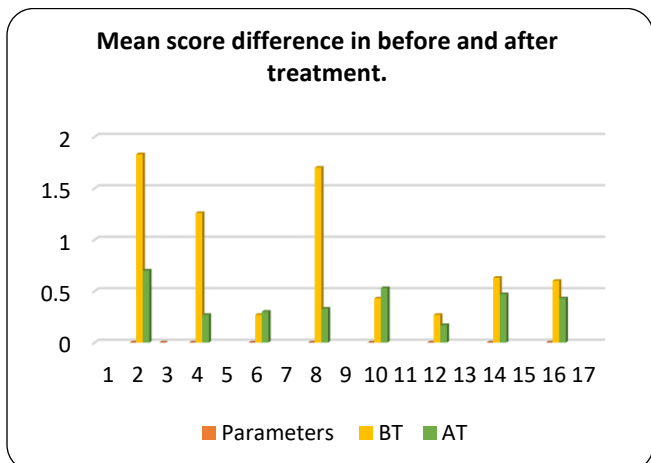
**Criteria for overall effect of therapy**

Complete Remission	100% Relief in the Subjective and Objective criteria.
Marked Improvement	More than 75% Relief in the Subjective and Objective criteria.
Moderate Improvement	50% -74% Relief in the Subjective and Objective criteria.
Mild Improvement	25%-49% Relief in the Subjective and Objective criteria.
Unchanged	Result below 25% was considered as unchanged.

**RESULTS AND DISCUSSION**

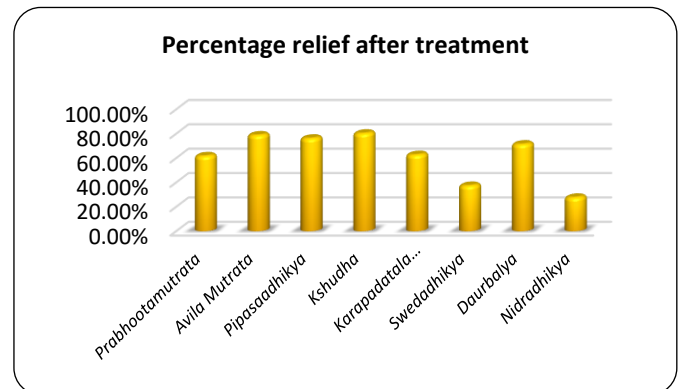
**Effects on subjective parameters:**

Parameters	BT	AT
Prabhoota Mootrata	1.83	0.70
Avila Mutrata	1.26	0.27
Pipasa	0.27	0.30
Kshudha	1.70	0.33
Kara-Pada-Tala Suptata/Daha	0.43	0.53
Swedadhikya	0.27	0.17
Daurbalya	0.63	0.47
Nidradhikya	0.60	0.43



**Percentage relief after treatment**

Parameter	% relief
Prabhoota Mootrata	61.81
Avila Mutrata	78.92
Pipasa	76.29
Kshudha	80.41
Kara-pada-tala Suptata/Daha	62.80
Swedadhikya	37.49
Daurbalya	71.463
Nidradhikya	27.78

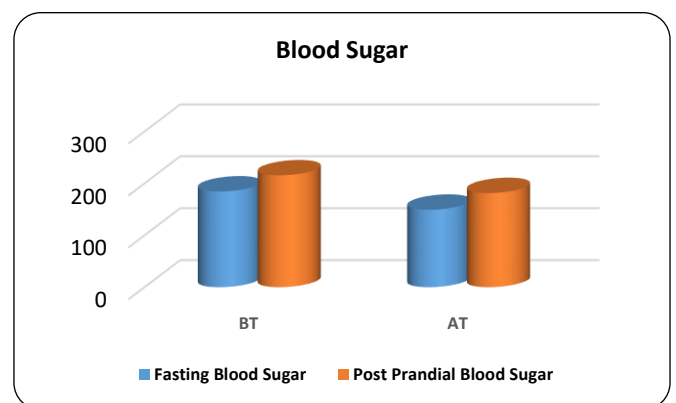


**Effects on objective parameters:**

**Mean score difference in before and after treatment.**

**Blood Sugar:**

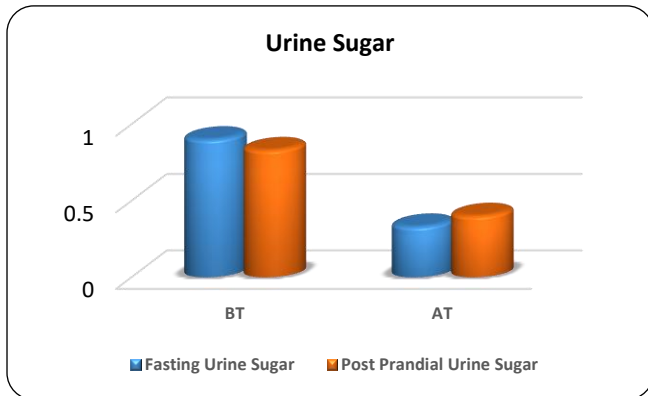
Parameter	BT	AT
Fasting Blood Sugar	184.40	149.23
Post Prandial Blood Sugar	215.43	181.37





**Urine Sugar:**

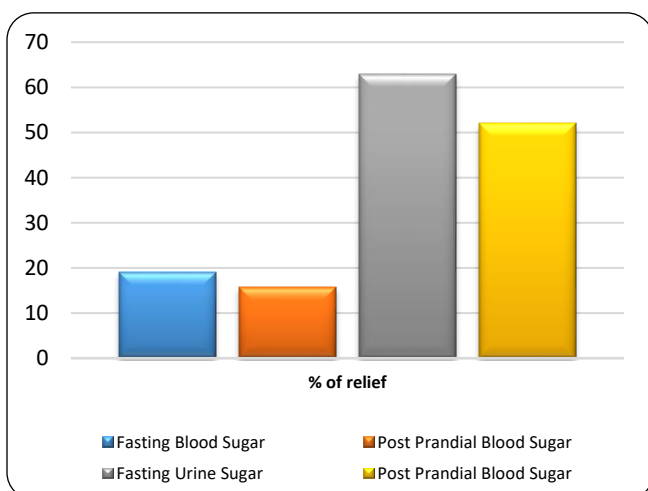
Parameter	BT	AT
Fasting Urine Sugar	0.90	0.33
Post Prandial Urine Sugar	0.83	0.40



**Percentage relief after treatment:**

Parameter	% of relief
Fasting Blood Sugar	19.07
Post Prandial Blood Sugar	15.81
Fasting Urine Sugar	62.96
Post Prandial Blood Sugar	51.99

Fasting Blood Sugar was reduced by 19.07%, Post Prandial Blood Sugar was reduced by 15.81%. Fasting Urine Sugar Reduced by 62.96%, Post Prandial Urine Sugar was reduced by 51.99%.



**Assessment of total effect of the treatment:**

The total effect of the therapy was assessed taking into consideration the total improvement in sign and symptoms and was calculated.

**Overall effect of Akulyaabdadi Kashaya:**

Category	No. of patients	Percentage
Complete Remission	03	10.00%
Marked Improvement	07	23.33%
Moderate Improvement	08	26.67%
Mild Improvement	08	26.67%
Unchanged	04	13.33%

It was seen that considerable no. of patients were shown complete remission in their sign and symptoms i.e., 10%, marked improvement shown in 23.33%, moderate improvement was observed in 26.67, mild improvement was observed in 26.67, and 13.33% patient remained unchanged. So, the results show *Akulyaabdadi Kashaya* has shown significant effect in reversal of the symptoms in *Madhumeha*.

**Discussion on Results:**

The given treatment was effective. The effect of the treatment in subjective and objective parameters in *Madhumeha* are explained as follows:

**Prabhut Mutrata & Avila Mutrata**

Statistical analysis reveals that the mean score of *Prabhoota Mutrata* was 1.833 before treatment and reduced to 0.7000 and this change that occurred with the treatment is statistically highly significant with an improvement by 61.811% and difference in mean was 1.133. Mean score of *Avila Mutrata* was 1.267 before treatment and reduced to 0.2667 and this change that occurred with the treatment is statistically highly significant with an improvement by 78.92% and difference in mean was 1.000. *Prabhoota Mutrata* is seen due to *Mutravaha Srotodusti* which is corrected by the *Pramehagna* effect and the *Rasayana* effect to rectify the *Srotodusti*. Excessive formation of *Kleda* and

*Ama* (hyperglycemia) in the body causes increased frequency and quantity of urination in the patients of diabetes mellitus. Ingredients of *Akulyaabdadi Kashaya* have dominance of *Katu-Tikta-Kashaya Rasa*, *Laghu-Ruksha Guna*, *Ushna Veerya*. Thus, all these properties act on *Dosha Visheshha* i.e., *Bahu Drava Sleshama* and *Dooshya Visheshha* i.e., *Kleda* (BSL lowering effect of ingredients below renal threshold), hence showed highly significant results on *Prabhut Mutrata* and *Avila Mutrata* in patients.

### Pipasa

Statistical analysis reveals that the mean score of *Pipasa* was 1.267 before treatment and reduced to 0.3000 and this change that occurred with the treatment is statistically highly significant with an improvement by 76.29%. And difference in mean was 0.9667. As there is excessive urination symptom patients feel thirstier and its due to *Pitta Dosha Vruddhi* and *Teekshnagni*. It is a result of excessive loss of *Drava Dhatu* due to *Prabhutmutrata*, *Akulyaabdadi Kashaya* reduces *Prabhut Mutrata* simultaneously reduces *Pipasa*. The drugs act as *Trisdoshashamaka*, *Trishnanigrahana* and *Rasayana* effect.

### Kshudha

Statistical analysis reveals that the mean score of *Kshudha* was 1.700 before treatment and reduced to 0.3333 and this change that occurred with the treatment is statistically highly significant with an improvement by 80.411%. And difference in mean was 1.367. Due to impaired *Agni* (insulin resistance or decreased insulin sensitivity) formation of vitiated *Kapha* and *Meda Dhatu* (fat) occurs which accumulates & obstructs the nutrient channels of remaining *Dhatu*s along with channels of *Vata*, which is presented as *Kshudhaadhikya* (polyphagia). Constituents of *Akulyaabdadi Kashaya* improves the status of *Agni* by its *Deepana-Pachana* action & maintain the optimum nutritional status of *Dhatu*s thus improving the symptom of *Kshudhaadhikya*.

### Kara-Pada-Tala Suptata / Daha

Statistical analysis reveals that the mean score of *Kara-Pada-Tala Suptata/ Daha* was 1.433 before treatment

and reduced to 0.5333 and this change that occurred with the treatment is statistically highly significant with an improvement by 62.80%. And difference in mean was 0.900. Here these symptoms are caused to vitiation of *Vata* and *Pitta Dosha* and due to *Avarana* pathology caused by excessive *Kapha Dosha* and *Meda Dhatu* including all 10 *Dushya* and these are corrected by *Trishnanigrahana*, *Kaphanissaraka*, *Dahaprashamana*, *Balya*, *Mridurechana*, *Nadi Balya*, and *Vatanulomana* etc. effects. It is common neurological complications of diabetes described in *Ayurvedic* literature as *Purvarupa* of *Prameha*. It reflects one's glycemic control. Therefore, when hyperglycemia is corrected with hypoglycemic activity of *Amalaki*, *Daruharidra*, *Asana*, *Tiphala*, *Haridra*, *Shilajatu*, *Akuli* etc. ingredients of *Akulyaabdadi Kashaya* the relief was obtained in these neuropathic complications like *Kara-Pada-Tala Suptata/ Daha Amalaki*, *Kataka*, *Vibhitaki*, *Haritaki*, *Akuli* and *Musta* are having *Nadibalya* effect, thus beneficial in neurological symptoms.

### Swedadhikya

Statistical analysis reveals that the mean score of *Swedadhikya* was 1.2667 before treatment and reduced to 0.16687 and this change that occurred with the treatment is statistically insignificant with an improvement only by 37.49%. And difference in mean was 1.1667. there is not much relief in this part but whatever achieved was due to the *Lekhana* property of *Akulyaabdadi Kashaya*. Drug of *kashaya*, *tikta rasatamaka* which reduces excessive *Kleda* & *Meda*.

### Dourbalya

Statistical analysis reveals that the mean score of *Dourbalya* was 1.633 before treatment and reduced to 0.4667 and this change that occurred with the treatment is statistically highly significant with an improvement by 71.463%. And difference in mean was 1.167. These were conditions found in many of diabetic patients because of less glucose uptake by muscle tissue for the energy. In *Prameha Apyamsha* of *Dhatu*s get converted in *Sharir Kleda* & excreted through urine as a result *Dhatukshaya* occurs causing *Daurbalya*. It is rectified by *Rasayana*, *Balya*, *Jeevaneeya*, *Varnya*, *Dhatuvaradhaka* and *Vrishya* effect.



**Nidra**

Statistical analysis reveals that the mean score of *Nidra* was 1.600 before treatment and reduced to 0.433 and this change that occurred with the treatment is statistically significant with an improvement by 27.78%. And difference in mean was 1.1667. *Nidra* is produced due to *Bahudrava Shleshma*, *Medodushti* and *Medodhatvagnimandya* (*Ch.ni.4/8*) mainly. As drugs of *Akulyaabdadi Kashaya* are *Deepana*, *Pachana Lekhana*, and *Rasayana* so they help to reduce this symptom.

**FBS:** The statistical analysis revealed that the mean FBS score before treatment was 184.40 and after treatment 149.23. This is statistically significant with an improvement by 19.07%. And difference in mean was 35.23.

**PPBS:** The statistical analysis revealed that the mean PPBS score before treatment was 215.43 and after treatment 181.37 with an improvement by 15.81%. And difference in mean was 34.067.

**FUS:** The statistical analysis revealed that the mean FUS score before treatment was 0.900 and after treatment 0.3333. This is statistically significant with an improvement by 62.96%. And difference in mean was 0.5667.

**PPUS:** The statistical analysis revealed that the mean PPUS score before treatment was 0.8333 and after treatment 0.4000. This is statistically significant with an improvement by 51.998%. And difference in mean was 0.4333.

Sugar in blood as well as in urine is the result of either deranged metabolism, lowered urinary threshold point, production of *Ama Dosha*, or due to their cumulative effect. Results indicate that reduction in urine sugar was well managed by *Akulyaabdadi Kashaya*. FBS, PPBS, FUS & PPUS had a marked reduction after the treatment in both groups. As the *Kwatha* contains drugs having *Pramehagna*, *Rasayana*, *Kapha-Medohara* effect. The drugs also proved to have hypoglycemic effect in clinical and experimental studies individuals.

**Discussion on Akulyaabdadi Kashaya****Probable mode of action of drugs**

*Akulyaabdadi Kashaya*<sup>[9]</sup> - is mentioned in *Prameha Chikitsa*, *Kashaya Prakaran* of *Sahasrayog* as an effective treatment in *Prameha*. The formulation *Akulyaabdadi Kashaya* consists of *Akuli*<sup>[10]</sup>, *Abdha*<sup>[11]</sup>, *Triphala*<sup>[12-14]</sup>, *Rajani*<sup>[15]</sup>, *Daruharidra*<sup>[16]</sup>, *Jambu*<sup>[17]</sup>, *Arjuna*<sup>[18]</sup>, *Vata*<sup>[19]</sup>, *Udumbara*<sup>[20]</sup>, *Ashvatha*<sup>[21]</sup>, *Plaksha*<sup>[22]</sup>, *Paarish*<sup>[23]</sup>, *Patha*<sup>[24]</sup>, *Kataka*<sup>[25]</sup>, *Agnimantha*<sup>[26]</sup>, *Khadira*<sup>[27]</sup>, *Ambastha*<sup>[28]</sup>, *Asana*<sup>[29]</sup>, *Indradrum*<sup>[30]</sup>, *Varida*<sup>[31]</sup>, *Kola*<sup>[32]</sup>, *Kinsuka*<sup>[33]</sup>, *Madhu*<sup>[34]</sup>, and *Adrija Tuttha* (*Shilajatu*<sup>[35]</sup>). Most of drugs like *Akuli*, *Haritaki*, *Amlaki*, *Jambu Agnimantha*, *Asana*, *Shilajatu*, *Madhu* and *Daruharidra* were having *Pramehara* property directly acting on etiopathogenesis of *Apathyanimittaja Prameha*. *Tikta*, *Katu*, *Kashaya Rasa*, *Laghu*, *Ruksha Guna*, *Ushna Virya* and *Katu Vipaka* might have corrected *Kapha Dushti* and *Medo Dhatu Dushti*. *Tikta Rasa* and *Sheeta Virya Dravyas* might have corrected vitiation of *Pitta*. In this way preparation acted on *Kapha-Pitta* and *Kapha Vargiya Dushya* providing significant relief on various parameters. The alleviation of *Kapha-Pitta* leads to removal of obstruction to path of *Vata* and *Tridosha Shamaka* drug also alleviates *Vata Dushti*, thus cause normal functioning of *Dhatu*s relieves the symptoms of *Prameha*.

In *Akulyaabdadi Kashaya* maximum drugs present in the formulation have a act as *lekhaniya*, *Balya*, *Kaphahara* & *Medohara Deepaniya* - *Pachaniya*, *Rasayana* and *Pramehaghna* property.

*Amalaki*, *Musta* and *Vibhitaki*, *Haritaki*, *Asana*, *Palasha* and *Shilajatu* have *Balya*, *Rasayana* and *Dhatuwardhaka* property, thus helps in rejuvenation of the cells and rectifying the *Khavaigunya* in the *Rogadhistaana*.

*Amalaki*, *Hareetaki*, *Vibheetaki*, *Ambastha*, *Haridra* and *Patha* present in the formulation is *Tridosahara* and help in rectifying *Dosha Dushti* and thus helps in *Samprapti Vighatana*.

*Akuli*, *Musta*, *Amlaki*, *Hareetaki*, *Vibheetaki*, *Haridra* *Daruharidra*, *Vata Udumbar*, *Plaksha*, *Agnimantha*,

*Khadira, Asana and Samudraphena* have *Ruksha Guna* thus is *Kapha, Medohara* helping in the *Samprapti Vighnana* help in *Kaphameda Harana* and thus helps in removing *Margavarana*, thus helps in the *Avaranaja* variety.

*Hareetaki, Vibheetaki, Haridra, Daruharidra, Patha, Kataka, Ambastha, Asana, Indradruma, Palasha* and *Madhu* have *Ushna Virya* and thus helps in *Vata Kaphaharana* and reversal of *Samprapti*.

*Daruharidra, Akuli, Abdha, Amlaki, Haritaki, Vibhitaki, Amlaki* and *Kataka* have *Chakshushya* property. The complications of diabetes like retinopathy, if any present can be helped by the formulation.

*Abdha, Haritaki, Samudraphena* has a *Lekhana* property, thus helping in the *Srotoshodhana* and in turn helpful in *Sthula* patients.

*Abdha, Amlaki, Haritaki, Kataka* and *Agnimantha* have *Nadibalya* effect and thus useful when there is neuropathy as a complication of diabetes.

*Vata, Arjuna, Asana, Madhu, Khadira, Asana, Plaksha, Parisha* and *Udumbara* has *Sheeta Virya* and *Dahahara* property necessary to act on the neuropathy condition.

*Akuli, Amlaki, Plaksha, Parisha* and *Asana* acts as *Stambhaka, Mutrasangrahani, and Shukrastambhaka*. Thus, showing effect on *Prabhoota Mutrata* condition

*Abda, Amlaki, Haritaki, Jambu, Samudraphena, Palasha* and *Madhu* due to their *Deepaniya* and *Pachaniya* property help in removal of *Ama Avastha* and better function of *Strotas*.

*Shilajatu* is mentioned by many *Acharyas* in *Paramaha Chikitsa*, it has *Kaphashamaka Rasayana, Yoghavi, Strotoshodhak, Pramehahara, Vrushya, Chedana* properties and reduces the blood sugar level efficiently.

*Haridra* has a *Tridoshashamaka* effect useful in all varieties of *Prameha*. *Haridra* also has a *Mutrasangrahaniya* quality. *Haridra* is considered to be the best *Agrya Dravya* in *Prameha*.

**Overall effects of therapy:** Total no. of patients was 30 out of which 08 (26.67%) shown mild improvement (25-49%) moderate improvement (50-74%). 7 (23.33%)

shown marked improvement (>75% relief), 3 patients (10%) completely improved. 4 (13.33%) had some benefit but was less than 13%, so remained unchanged.

Stress is also an important etiological factor for Type-II Diabetes Mellitus. Stress blocks the body from releasing insulin in people with Type-II Diabetes Mellitus, so relieving stress is very much essential for effective control of blood sugar level. The ingredients present in the formulation *Akulyaabdadi Kashaya* are having different properties which may be helpful in minimizing the stress response. As *Haritaki & Vibhitaki* are anti stress they might have been decreased the stress directly. *Rasayana* effect of *Haritaki, Amalaki, Asana, Plaksha, Musta, Shilajatu* antioxidant properties of *Amalaki, Haridra* and immunomodulatory property of *Amalaki, Haridra, Shilajatu etc.* might have helped in minimizing the stress response and in the manner controlling the disease. *Akulyaabdadi Kashaya* clears the *Strotas'* enhances the *Agni*, thus helps in *Pachana* of *Ama* and increases insulin sensitivity. So, it can be said that *Akulyaabdadi Kashaya* plays significant role in reversal of the condition faster along with *Pathya*. Hence the hypothesis that *Akulyaabdadi Kashaya* is significantly effective in treatment of *Madhumeha* (Type-II Diabetes Mellitus) is accepted.

## CONCLUSION

*Madhumeha* is a *Santarpanjanya Vyadhi* afflicting the *Mutravaha* and *Udakavaha Srotas* produced due to vitiation of *Vata Pradhana Tridosha*. Most of the patients were females, of 40-60 years' age group, Hindus, married, housewives, had mixed diet, few of them had positive family history and chronicity of 1 to 5 years.

There is dominancy of *Kapha* among *Doshas, Meda* among *Dooshyas*. Most of the patients had, *Prabhoota Mootrata, Avila Mutrarata, Kshudha, and Daurbalya* among the many symptoms recorded. According to *Nidana*, both *Dhatukshaya* and *Avarana* varieties of *Madhumeha* were seen in this study. Most of the patients were *Sthoola Parmehi*. Formulations selected for the study were easy to prepare, and easily

available. The effect of *Akulyaabdadi Kashaya* on individual parameters showed a better relief in *Prabhoota Mootrata*, *Avila Mutrarata*, and *Daurbalya Karapadatala Suptata/Daha*, FBS, FUS, PPBS and PPUS & in quality of life. The effect of drug showed a statistical significance in *Prabhoota Mootrata*, *Avila Mutrata*, *Kara-Pada-Tala Suptata* and *Daurbalya* and *Swedadhikya* parameter and no statistical significance in the rest of the parameter. None of the patients had any untoward effects during the treatment with given formulation. No complications were seen during the management. Taking in consideration, the results obtained during the study and discussion. It can be said that provided significant results in improving signs and symptoms. Hence it is proved to be an efficient antidiabetic drug.

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