



### Hypoglycemic activity of *Kaidarya Patra Choorna* (*Murraya koenigii linn.*) in Diabetes mellitus type 2 with OHA's

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#### Abstract:

Globally and nationally the Diabetes mellitus with its complications become the most important contemporary and challenging health problem. It should be treated with diet and exercise, typically in conjunction with oral hypoglycemic drugs (OHD) and the complications are so critical and hazardous, and oral hypoglycemic agents and insulin which is used for the treatment of diabetes mellitus by the allopathic system of medicine have numerous side effects. In spite of available treatment number of patients is on rise. It is convincing that the herbal or mineral remedies stated in *ayurveda* used singly or in combination have potency in the treatment of madhumeha. However, our country is indeed rich in its vast variety of flora, through variegated physical feature of the

land, extending from mountains to the oceans. The practitioners of Indian system of medicine have been using the plant materials and are claiming success in treatment of *madhumeha* even today. Therefore, taking a lead it will be worthwhile to reappraise the commonly used plant remedies in the treatment of *madhumeha*, with an unbiased scientific spirit. In *Ayurveda* *kaidarya* is mentioned as *parvata nimba*. *Nimba* is the best drug used in *Prameha*. Edible variety of *Nimba* i.e. curry leaves can be useful. *Kaidarya* is having *katu*, *tikta*, and *kashaya rasa* and *sheeta veerya*. It pacifies vitiated *kapha* and *pitta*. *Kaidarya* has been used traditionally since few years for treatment of *prameha*. Placebo control may not be ethical in the disease hence single arm study along with modern medicine is preferred.

**Keywords:** Diabetes mellitus, kaidarya, Oral Hypoglycemic agents

### **Introduction:**

Plants have been the major source of drugs in Indian system of medicine and other ancient systems in the world. Earliest description of curative properties of medicinal plants is found in Rig-Veda (2500 -1800 BC). Charka Samhita and Sushruta Samhita give extensive narration on various medicinal herbs. Now in current scenario the use of plant derived natural products in drugs preparations becomes a drift, therefore there is a need to date information on the properties, uses, efficacy, safety of medicinal plant products. Diabetes mellitus is one of the most common chronic disease in the whole world. It is a complex, multifactorial disease, which affects the quality, quantity, and style of a person's life. The fact confirmed by report from the World Health Organization (WHO) shows that India has the largest number of diabetic patients in the world. Many drugs have been used to control hyperglycaemia, but these synthetic agents produce some serious side effects and are relatively costly for developing countries. The toxicity of oral anti-diabetic agents varies widely in clinical expressions, strictness, and treatment. In the natural system of medicine, many plants have been appealed to be useful for the treatment of hyperglycaemia. The dependence of large rural population on medicinal plants for treatment of diabetes is because of its convenience and affordability. Additionally, after the approval made by WHO on diabetes mellitus, the recognition of antidiabetic agent derived from plants

become more popular and important. Many plant sps like *Dillenia indica*, *Trigonella foenumgracum* and *Amaranthus sps* etc. have been evaluated for their hypoglycaemic action. Hyperglycaemia is a pathological condition associated with prediabetes and diabetes. The occurrence of prediabetes and diabetes is increasing and carry out great problem on healthcare worldwide. Patients with prediabetes and diabetes have significantly increased risk for cardiovascular diseases and other problems. Presently, management of hyperglycaemia includes pharmacological involvements, physical exercise, and change of life style and diet. Food supplements have increasingly become better alternatives to treat hyper-glycaemia. In a review regarding anti- diabetic herb, five commonly used food supplements with hypoglycaemic effects, including *Embllica officinalis* (gooseberry), fenugreek, green tea, *Momordica charantia* (bitter melon) and cinnamon were considered. Fenugreek and *Embllica officinalis* showed the most consistency in lowering fasting blood sugar (FBS) or glycated hemoglobin (HbA1c) levels in diabetic patients. The hypoglycaemic effects of cinnamon and *Momordica charantia* were seen the best. However, green tea exhibited inadequate benefits in reducing FBS. In another report, the consumption of cinnamon is connected with a statistically significant decrease in levels of fasting plasma glucose. *Murraya koenigii* (Family: Rutacea) is a small tree. Curry leaf is found almost throughout India up to an altitude of 1500 meters. It is much cultivated for its aromatic leaves. Kaidarya plant (experimental plant) extracts (methanolic and aqueous) have been

evaluated for its hypoglycaemic activity in Streptozotocin induced diabetic rat model, so it was highly essential to compare the data of hypoglycaemic activity of *Kaidarya (Murraya koenigii linn.)* leaves powder with previous results.

Hence, the main goal of the present study to find out the better source to manage the hyper glycaemia. We have evaluated leaves powder of the experimental plant (*Murraya koenigii*) collected from Pune, Maharashtra region in the month of October for its hypoglycaemic action.

**AIM:**

- To evaluate hypoglycemic activity of *kaidarya patra choorna (Murraya koenigii Linn.)* In Diabetes mellitus type 2 with oral hypoglycemic agent.

**Objective:**

- To study ayurvedic perspective of prameha.
- Elaborative study of Diabetes mellitus
- Detailed study of *kaidarya*.
- To assess the hypoglycemic activity of *kaidarya patra choorna* in treatment of Diabetes mellitus type 2.

**MATERIAL AND METHODS**

**Materials: -**

**1) Patients:**

32 patients were selected from indoor and outdoor patients department of the hospital.

**2) Drugs:**

- *Kaidarya patra choorna*
- Tab. Metformin
- Tab. Sulfonyl group.

**3) Instrument:**

Weighing machine

**4) Preparation of *Kaidarya Patra Choorna*:**

- According to Sharangdhara Samhita *choorna* was prepared.

The drugs mentioned in the *churna* yoga are cleaned and dried. They are powdered by pounding with mortar and pestle and sieved through a thin layer of cloth (*Vastragalita*). In a prescription where there are a number of ingredients, the best method is to powder the drugs separately, weigh the required quantities of the drugs and mix them all together.

**Dose and time of administration:**

**Dose:** 2.5 gm of *choorna*

**Time:** Twice a day

**Kaal:** *Apankaal* (Before meals)

**Anupana:** *Koshnajala*

**Duration:** 90 days.

- Authentication of the drug was done in Botanical survey of India, Pune.
- Standardization of the drug was done in Standard Pharmacy. Analytical reports are as follows-

- Analytical reports of Kaidarya patra chorna.

PHYSICAL TESTS	RESULT
Description	Fine powder
Colour	Light greenish
Odour	Characteristically aromatic
Taste	Acrid
Moisture content	3.8%
Ash	14.76%
Acid insoluble Ash	3.06%
Alcohol soluble extracts	10.65%
Water soluble extracts	26.27%
pH	5.7

#### METHODOLOGY:

- This was prospective, randomized, controlled, single blind clinical trial.
- Through history and complaints of the patients were taken. Each and every patient was carefully examined clinically for general and systemic sign and symptoms.
- Full explanation about the trial was given to each patient and written consent of each patient was taken before the commencement of treatment.
- After that total 32 patients were selected for present clinical trial on the basis of clinical diagnosis.

- Randomized method was used for selecting patients in trial or control group and equally divided into two groups as below:-

**Trial Group:** - In this group, 16 patients of Diabetes Mellitus (Madhumeha) taking oral hypoglycemic drugs maximally two regimes (i.e. Metformin + sulfonyl urea) advised by allopathic experts with Kaidarya patra choorna.

**Control Group:** - In this group, 16 patients of Diabetes Mellitus (Madhumeha) taking oral hypoglycemic drugs (Metformin + sulfonyl urea) advised by allopathic experts.

**5) Pathya and Apathya:** Trial group and control group were advised to take standard diabetic diet according to ayurvedic texts and modern medical science.

#### 6) Inclusive Criteria:

- Age- 30-50 yrs.
- BSL: - fasting upto 200mg/dl.  
Post prandial upto 300mg/dl.
- Volunteers with Diabetes Mellitus type 2 taking regular medicines.

#### 7) Exclusive Criteria: -

- Individuals recently hospitalized or undergone any major surgery (within 3 months)
- Individuals with BSL fasting more than 200 mg/dl and Post prandial more than 300mg/dl.
- Pregnant women and lactating mothers.
- Individuals with major systemic illness. E.g. CA, AIDS, TB etc.
- Patients not willing for trial.

### 8) Diagnostic Criteria: -

- BSL
- HbA1c (glycated haemoglobin)
- Classical signs and symptoms of Diabetes Mellitus with clinical relevance.

### 9) Withdrawal Criteria: -

- During the course of trial if there were any hypo/hyperglycemic episodes or any other serious conditions which urgently requires investigations and treatment.
- Patient him/herself wants to withdraw from clinical trial.
- Those who do not appear for regular follow up.

**10) Follow up:** - Follow up of patients of both the groups were taken for observation on 30<sup>th</sup>, 60<sup>th</sup> and 90<sup>th</sup> day. Observational parameters including prabhootamutrata, aavilmutrata, Naktamutrata were recorded each and every follow up. Then relief of signs and symptoms of both groups were compared with each other.

### 11) Parameters for Assessment: -

Assessment of signs and symptoms were done by adapting suitable scoring method.

- 1] Prabhoota Mutrata:
- 2] Aavilmutrata:
- 3] Naktamutrata:
- 4] Swedatipravritti:
- 5] Hasta-pada-tala-daha

6] Pipilika sanchar

7] Lab investigation:

- BSL- Fasting and Post Prandial
- HbA1c

### Observation and results:

Table: Changes in HbA1C before and after treatment

Sr.No.	Group	HbA1C		
		Mean BT	Mean AT	Diff.
1	Group A	7.68	7.32	0.36
2	Group B	7.59	6.91	0.68

- It was observed that average decrease in HbA1C is more in Trial Group (B) as compared to Control Group (A).
- Table: % Relief in Symptoms of Group A & Group B

Sr. No.	Symptoms	% Relief	
		Group A	Group B
1	Prabhuta mutrata	42.86	84.62
2	Avil mutrata	46.88	75.86
3	Nakta mutrata	61.76	83.33
4	Sweda ati pravartan	50.00	100.0
5	Hat pada tala daha	83.33	80.00
6	Pipilika sanchar	66.67	91.67
7	Average % Relief	58.58	85.91

Table: Avg. decrease in HbA1C in both Groups

Sr.	Parameters	Avg. Change
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No.		Group A	Group B
1	HbA1C	0.36	0.68

Table: Overall Effect of Therapy according % Relief

Sr. No.	Criteria	Improvement Grade	No. of patients		No. of symptoms	
			Gr. A	Gr. B	Gr. A	Gr. B
1	75% to 100%	Marked	00	15	01	06
2	50% to 74%	Moderate	13	01	03	00
3	25% to 49%	Mild	03	00	02	00
4	00% to 24%	Poor	00	00	00	00

- According to statistical analysis

Table: Overall Effect of Therapy Statistical analysis (Subjective)

Sr. No.	Subjective Parameters	Within Groups (Wilcoxon test)		Comparison (Mann-Whitney's test)
		Group A	Group B	
1	P. mutrata	Significant	Significant	Significant (B > A)
2	A. mutrata	Significant	Significant	Significant (B > A)
3	N. mutrata	Significant	Significant	Insignificant (A ≈ B)
4	Swedaatipravritti	Significant	Significant	Significant (B > A)
5	Hat pada daha	Significant	Significant	Insignificant (A ≈ B)
6	Pipilika sanchar	Significant	Significant	Insignificant (A ≈ B)

(≈ - means statistically equal, not exact equal)

- Table: Overall Effect of Therapy Statistical analysis (Objective)

Sr. No.	Objective Parameter	Within Groups (Paired t test)		Comparison (Unpaired t test)
		Group A	Group B	
1	HbA1C	Significant	Significant	Significant (B > A)

## Discussion on Results:

The parameters of *Madhumeha* were statistically analyzed. Significance of difference between before and after treatment was assessed by applying student's 't' test for unpaired data of objective parameters like HbA1c. The Wilcoxon test was applied to compare the effect of both treatments. In case of all the parameters, the statistical evaluation revealed that there was significant reduction in sign and symptoms, hence both the treatment were significantly effective in case of *Madhumeha*. When Wilcoxon test was applied to compare the effect of both treatment, it showed that in case of *prabhoot mutrata*, *aavilmutrata*, *naktamutrata* the treatment of trial group was significantly superior than that of control group. When unpaired 't' test was applied to compare the effect of both the treatment, it showed that in case of BSL the treatment of trial group was significantly superior to control group. Effect on *prabhoot mutrata*, *aavilmutrata*, *naktamutrata* was due to *kledaghna*, *kaphaghna*, *laghu*, *ruksha* property and *Kashaya*, *Tikta rasa Pradhan*. In this study it was observed that the patients having mild to moderate signs and symptoms were get cured and those having moderate to severe symptoms were improved.

### Trial group:

Improvement i.e. controlled diseased condition was found in trial group was 93.75% marked improvement was observed, and 6.25% moderate improvement was observed.

### Control group:

Improvement i.e. controlled diseased condition was found in control group was 81.25% moderate improvement was observed, and 18.75% mild improvement was observed.

## Conclusion:

- After analyzing the all data and observations, it was concluded that *Kaidarya patra choorna* used in trial group along with the oral hypoglycemic agents ( Metformin + Sulphonyl Urea group) shown significant results as compared to only oral hypoglycemic agents ( Metformin + Sulphonyl Urea group) used in control group.
- Statistically significant effect of *Kaidarya patra choorna* on *prabhoot mutrata*, *aavilmutrata* and on BSL as compared to control group was may be due to-
- Correction of *dushya kleda- utpatti* which is responsible for above said *lakshana's* in *samprapti*
- The drug also may act at *mulasthana* of *mutravaha strotas* which are *meda/vapavahan*.
- Further it has been concluded that combined therapy is superior and also has organ protective (hepato protective) effect. So for long term use combined therapy is recommended, since *kaidarya* is *swasthavrittakar dravya* is safe to take for longer duration in prescribed dose.

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