ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed(Group –I) Journal Volume 11, Iss 13, Dec 2022

EVALUATING THE EFFICACY OF MESHASHRINGI (GYMNEMA SYLVESTRE) IN MANAGING TYPE 2 DIABETES MELLITUS: A CLINICAL STUDY

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Abstract

Background: Diabetes Mellitus, particularly Type 2 Diabetes Mellitus (T2DM), has become a significant public health concern globally, with rising prevalence rates associated with lifestyle factors. The increasing burden of T2DM necessitates effective management strategies beyond conventional pharmacological approaches.

Objective: This clinical study aims to evaluate the efficacy of Meshashringi (Gymnema sylvestre) in managing Madhumeha (T2DM) by assessing its effects on glycemic control and symptomatic relief.

Methods: A total of 30 patients aged 30-60 years, with fasting blood glucose levels > 126 mg/dl and uncomplicated diabetes, were enrolled in this 18-month study. Participants received 3g of Meshashringi powder twice daily before meals for 90 days. Key inclusion and exclusion criteria were established, and informed consent was obtained from all patients. Glycemic control was measured through fasting blood glucose (FBS), postprandial blood glucose (PPBS), and HbA1C levels. Symptomatic relief was evaluated based on a scoring pattern for classical diabetes symptoms.

Results: Significant reductions were observed in both FBS and PPBS, with mean decreases of 17.06% and 15.09%, respectively ($p < 0.0001$). The HbA1C levels decreased by 3.50% post-treatment ($p < 0.001$). Additionally, symptom relief was evident, with substantial improvements noted in conditions such as polyuria (73.3% improvement), polydipsia (83.3%), and polyphagia (96.7%).

Conclusion: The findings indicate that Meshashringi is an effective intervention for managing Madhumeha, demonstrating significant improvements in glycemic control and symptom relief

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without notable side effects. These results support the integration of Ayurvedic practices into contemporary diabetes management, highlighting the potential of herbal therapies as safe and effective alternatives.

Keywords: Meshashringi (Gymnema Sylvestre), Madhumeha, Diabetes Mellitus

Introduction

Diabetes Mellitus, a complex metabolic disorder, has emerged as one of the most significant public health challenges of the 21st century. Characterized by chronic hyperglycemia resulting from insulin deficiency, resistance, or both, diabetes leads to serious complications affecting multiple organ systems, including the cardiovascular, renal, and nervous systems. Type 2 Diabetes Mellitus (T2DM), which constitutes about 90-95% of all diabetes cases, is particularly alarming due to its strong association with lifestyle factors such as obesity, sedentary behavior, and poor dietary habits.

The rising prevalence of T2DM is not just confined to industrialized nations; it is increasingly affecting low- and middle-income countries as well. In India, the rapid urbanization and changing dietary patterns have resulted in a staggering increase in diabetes cases, with the country projected to have the highest number of diabetic patients globally. The World Health Organization estimates that the number of people with diabetes will reach 642 million by 2040, underscoring an urgent need for effective management strategies.

Traditional management of T2DM has predominantly relied on pharmacological interventions, including oral hypoglycemic agents and insulin therapy. While these treatments can help control blood glucose levels, they often come with adverse side effects and may not address the underlying metabolic dysfunction. This has led to a growing interest in complementary and alternative medicine, particularly in the realm of herbal therapies.

Ayurveda, an ancient holistic system of medicine, offers a wealth of knowledge regarding the management of chronic diseases, including diabetes. Ayurvedic practices emphasize a comprehensive approach to health, focusing on diet, lifestyle, and natural remedies that promote balance within the body. One such herb, Meshashringi (Gymnema sylvestre), has garnered attention for its potential anti-diabetic properties. Known in Ayurveda as a powerful hypoglycemic agent, Meshashringi has been used traditionally to support healthy blood sugar levels and enhance metabolic functions.

This clinical study aims to investigate the efficacy of Meshashringi in managing Madhumeha (Type 2 Diabetes Mellitus). By evaluating its impact on blood glucose levels and overall metabolic health, this research seeks to contribute to the growing body of evidence supporting

the integration of Ayurvedic practices into modern diabetes management, potentially offering a safer and more effective alternative for patients.

Methods

Inclusion/Exclusion Criteria

1.1 Inclusion Criteria

- Age group between 30-60 years in both sexes.
- Patients willing to participate in the study.
- Fasting blood glucose level > 126 mg/dl.
- Postprandial blood glucose level < 300 mg/dl.
- Uncomplicated diabetes.
- Classical symptoms of diabetes.

1.2 Exclusion Criteria

- Age group below 30 years and above 60 years in both sexes.
- Patients unwilling to participate in the study.
- Postprandial blood glucose level above 300 mg/dl.
- Diabetes with complications such as diabetic foot, retinopathy, chronic kidney disease, or heart disease.
- Patients currently taking modern anti-diabetic medications at the time of research.

1.3 Diagnostic Criteria

- **Subjective Criteria**: Clinical signs and symptoms as per Ayurvedic and modern trends.
- **Objective Criteria**: Laboratory investigations including fasting and postprandial blood sugar levels, HbA1C, and urine sugar in selected cases.

Informed Consent- Informed consent was obtained from all patients using a consent form.

Study Period- The study was conducted over a period of 18 months, with individual patients monitored for 90 days.

Treatment Protocol- Thirty patients were treated orally with Meshashringi powder in a dose of 3g twice daily before meals with water.

Assessment Criteria: The patient was assess on the basis of relief of sign and symptom through the following scoring pattern

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Assessment Criteria	Score	Description
1. Prabhuta Mutrata (Polyuria)		
A. Quantity	0	1.5 to 2.5 lit/day
	1	2.5 to 3.0 lit/day
	2	3.0 to 3.5 lit/day
	3	> 3.5 lit/day
B. Frequency	0	3 to 5 times/day
	1	5 to 7 times/day
	2	7 to 10 times/day
	3	10 to 12 times/day
2. Atipipasa (Polydipsia)		
	0	1.5 to 2.5 lit/day
	1	2.5 to 3.0 lit/day
	2	3.0 to 3.5 lit/day
	3	> 3.5 lit/day
3. Ati Khuda (Polyphagia)		
	0	Normal appetite
	1	Mild appetite (2 meals/day)
	2	Moderate appetite (3 meals/day)
	3	Severe appetite (4 meals/day)
4. Abil Mutrata (Turbid Urine)		
	0	Clear urine
	1	Mildly turbid

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Assessment Criteria	Score	Description
	2	Moderately turbid
	3	Severely turbid
5. Mutra Madhurjya		
	0	Absence of glucose
	1	+ Glucose in urine
	2	++ Glucose in urine
	3	+++ Glucose in urine

Statistical analysis: All the observation made on the aforesaid criteria & were compared and grouping was analyzed statistically in terms of mean (x), standard deviation (SD), standard error (SE). The student paired (t) test were carried out and the information were interpreted in terms of label of significant (p value).

Results

1. **Glycemic Control-** The effects of Meshashringi (Gymnema sylvestre) on glycemic control are summarized in Table 1. The mean values of fasting blood glucose (FBS) and postprandial blood glucose (PPBS) were significantly reduced after treatment.

Table 1: Glycemic Control Before and After Treatment

Parameter	**N=30**	**Mean (BT)**	**Mean (AT)**	**% Relief**	**SD**	**SE**	**T-Value**	**P-Value**
FBS		139.26	115.5	17.06%	9.44	1.723	9.337	<0.0001
PPBS		265	225	15.09%	17.65	3.222	8.221	<0.0001

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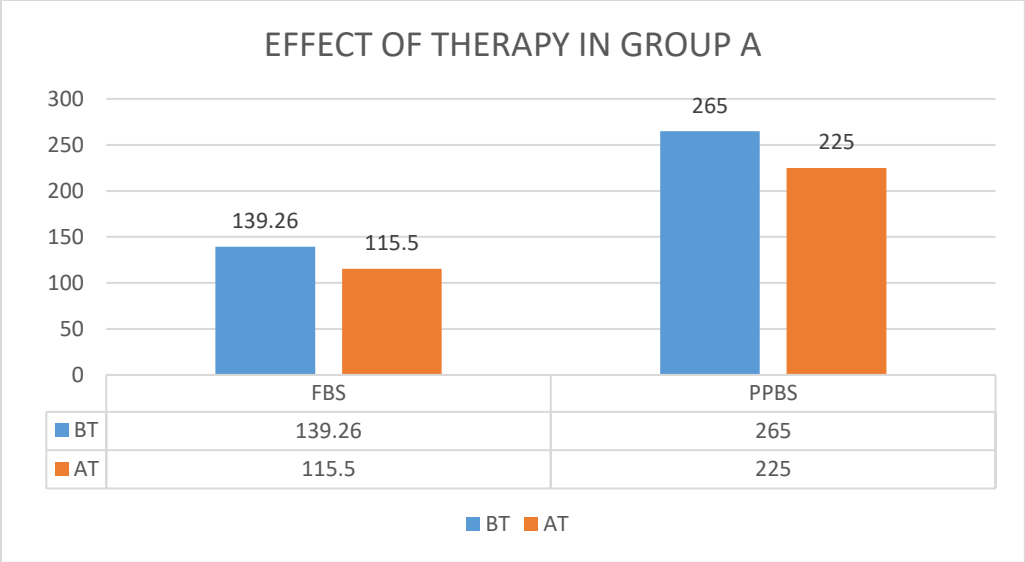
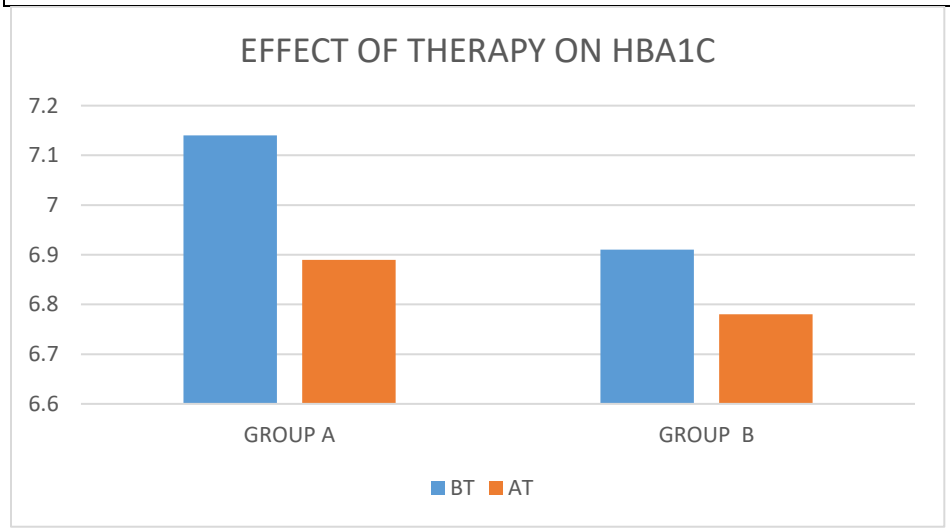


Graph 1: Effect Of Treatment In Group 'A' Patient Of Madhumeha(Type 2 Diabetes Mellitus

2. **HbA1C Levels-** The impact of Meshashringi on HbA1C levels is illustrated in Table 2. A significant decrease was observed post-treatment.

Table 2: HbA1C Levels Before and After Treatment

Group	HbA1C (Mean)	N=20	% Improvement	SD	SE	T-Value	P-Value
Group A	7.14	20	3.50%	0.3836	0.1213	10	<0.001



Graph 2: Effect Of Therapy On HbA1C

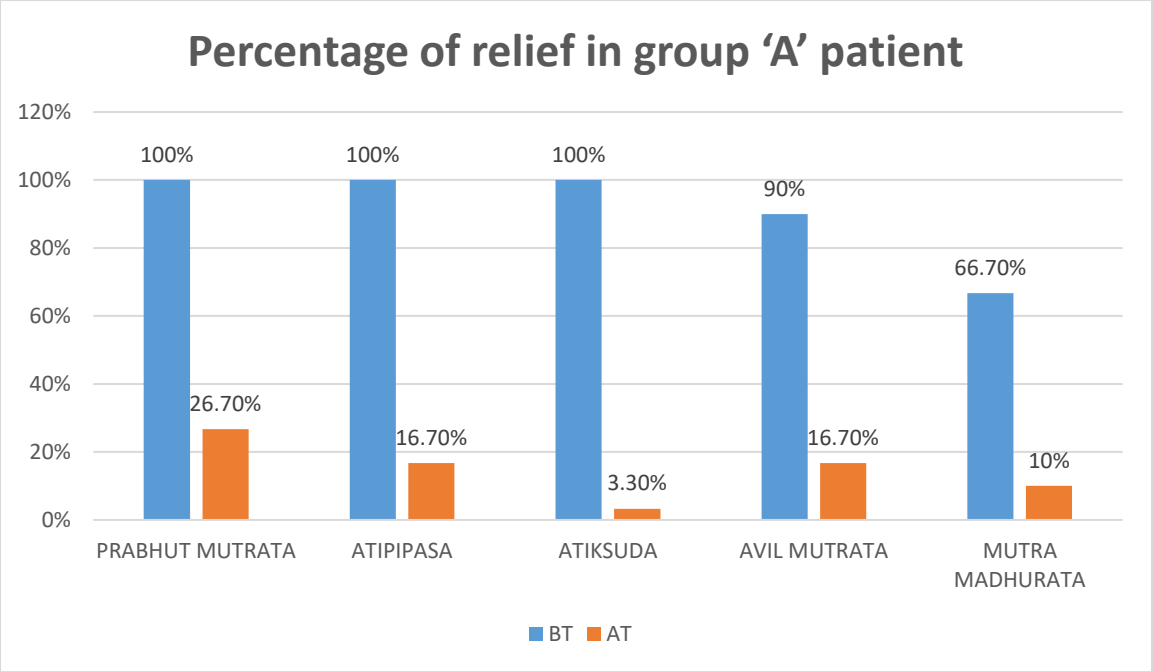
ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed(Group –I) Journal Volume 11, Iss 13, Dec 2022

3. Symptom Relief

The percentage of relief of classical symptoms of Madhumeha before and after treatment in Group A patients is presented in Table 3. A significant improvement was observed in all symptoms after the administration of Meshashringi.

Table 3: Percentage of Relief of Symptoms Before and After Treatment in Group A Patients

SN	Symptoms	Before Treatment (%)	After Treatment (%)	Percentage of Improvement (%)
1	Prabhut Mutrata	100%	26.7%	73.3%
2	Atipipasa	100%	16.7%	83.3%
3	Atiksuda	100%	3.3%	96.7%
4	Avil Mutrata	90%	16.7%	73.3%
5	Mutra Madhurata	66.7%	10%	56.7%



Graph 3: Percentage of relief of symptoms before and after treatment of group 'A' patient

The results indicate that treatment with Meshashringi significantly improved glycemic control and alleviated classical symptoms of diabetes in patients. The reductions in both fasting and postprandial blood glucose levels, along with improvements in HbA1C and symptomatic relief, suggest that Meshashringi is effective in managing Madhumeha (Type 2 Diabetes Mellitus).

DISCUSSION:

Mechanism of Action

Meshashringi has been traditionally recognized for its hypoglycemic effects, which can be attributed to several phytochemical constituents, including gymnemic acids, flavonoids, and saponins. Gymnemic acids are particularly noteworthy for their ability to inhibit glucose absorption in the intestines and promote insulin secretion from the pancreas, thus lowering blood glucose levels. Additionally, these compounds may enhance glucose utilization by improving insulin sensitivity in peripheral tissues, which is crucial for patients with insulin resistance, a hallmark of T2DM.

Clinical Outcomes

The findings of our study demonstrate a statistically significant reduction in fasting blood glucose (FBS) and postprandial blood glucose (PPBS) levels among patients treated with Meshashringi. The mean decrease in FBS (17.06%) and PPBS (15.09%) after treatment reflects the herb's efficacy in managing hyperglycemia. Moreover, the reduction in HbA1c levels further corroborates the long-term glycemic control that Meshashringi may offer, with an observed improvement of 3.50% post-treatment. These outcomes align with previous research highlighting the hypoglycemic properties of Gymnema sylvestre, suggesting its potential as an adjunct therapy in diabetes management.

Safety and Tolerability

One of the critical advantages of utilizing Meshashringi in diabetes treatment is its favorable safety profile. Unlike many conventional anti-diabetic medications, which often lead to adverse effects such as hypoglycemia, gastrointestinal disturbances, and weight gain, our study participants did not report significant side effects related to Meshashringi supplementation. This aligns with Ayurveda's emphasis on natural remedies that not only target disease management but also maintain the overall well-being of individuals.

Comparison with Conventional Treatments

The integration of Meshashringi into diabetes management protocols presents a complementary approach to conventional therapies. While pharmacological agents are effective in controlling

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blood glucose levels, they may not address the underlying lifestyle factors contributing to T2DM. In contrast, Ayurveda promotes holistic health by advocating for dietary modifications, physical activity, and herbal supplementation. Thus, incorporating Meshashringi may enhance patient compliance and overall treatment outcomes.

Limitations and Future Directions

While the results are promising, the study has limitations that warrant consideration. The sample size, though sufficient for preliminary findings, may not be representative of the broader population. Additionally, the study duration of 90 days may not be long enough to fully assess the long-term effects of Meshashringi on glycemic control and related complications. Future research should involve larger, multicentric trials with extended follow-up periods to further elucidate the herb's efficacy and safety.

Conclusion

In conclusion, this clinical study supports the potential of Meshashringi (Gymnema sylvestre) as a safe and effective intervention for managing Madhumeha (Type 2 Diabetes Mellitus). By demonstrating significant reductions in blood glucose levels and improvements in overall metabolic health, Meshashringi emerges as a valuable addition to diabetes management strategies, particularly within an Ayurvedic framework. The findings advocate for further exploration of herbal therapies in the pursuit of comprehensive diabetes care, emphasizing the importance of integrating traditional knowledge with modern medical practices to enhance patient outcomes.