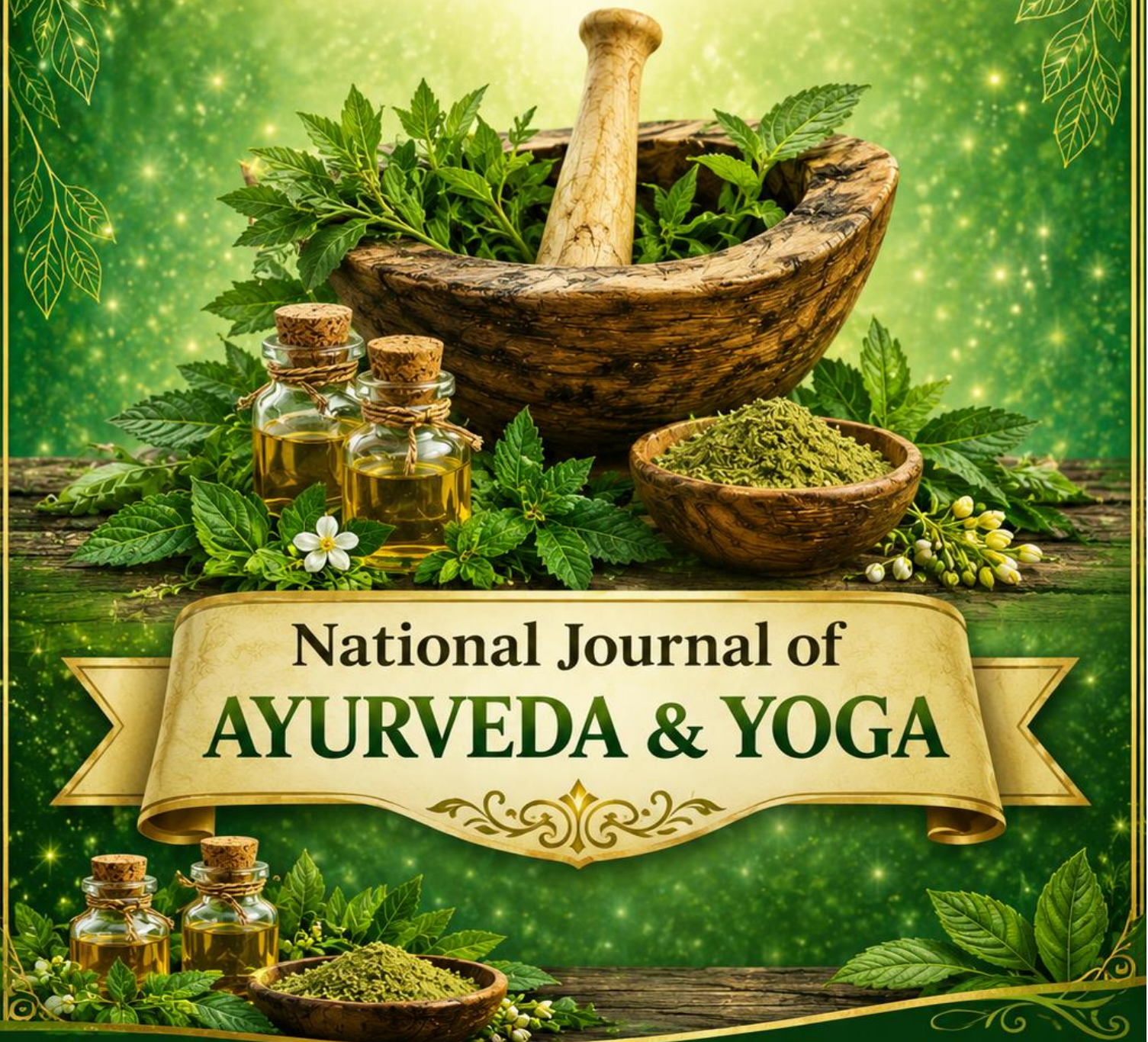




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“MAMAJJAKA GHANA VATI AN EARLY DRUG OF CHOICE FOR THE MANAGEMENT OF KAPHA PITTAJA PRAMEHA (NEWLY DIAGNOSED CASES OF TYPE 2 DIABETES MELLITUS): REVIEW ARTICLE”**Dr. Kundan Sushilkumar Wasnik¹, Dr. Rajaram Mahto², Dr. Archana Dachewar³**

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ABSTRACT:

Diabetes mellitus is a rapidly escalating global health concern, primarily attributed to a sedentary lifestyle, psychological stress, and unhealthy dietary habits. Despite the availability of a wide range of pharmacological interventions in contemporary medicine, their long-term use is frequently associated with adverse effects and suboptimal patient satisfaction. According to the World Health Organization, the global prevalence of diabetes has increased markedly from 108 million in 1980 to 422 million in 2014, underscoring the need for more comprehensive and sustainable management approaches. Modern medical strategies largely focus on achieving target-oriented glycemic control. However, recent evidence emphasizes the importance of a multidimensional approach for improved long-term outcomes. In Ayurveda, diabetes is correlated with Prameha, a group of metabolic disorders classified under Anushangi Vyadhi (chronic and relapsing conditions). Ayurvedic management adopts a holistic and individualized approach, considering etiological factors (Nida), clinical features (Lakshana), pathogenesis (Samprapti), systemic involvement, and the strength of both the patient (Roi Bala) and disease (Vyadhi Bala). Classical Ayurvedic literature describes numerous formulations for the management of Prameha. Among these, Mamajjaka Ghana Vat has gained considerable attention due to its diverse pharmacological properties, including antioxidant, antihyperlipidemic, neuroprotective, and ulcer-healing activities. These properties may contribute not only to glycemic control but also to the prevention and management of iabetic complications. Considering the challenges in selecting appropriate therapeutic interventions for newly diagnosed diabetic patients, the present review aims to critically evaluate Mamajjaka Ghana Vat with respect to its pharmacological profile, mechanism of action, and clinical efficacy based on available scientific evidence.

KEY WORDS:- Diabetes, Prameha, Mamajjaka Ghana Vati, Anti-oxidant, Anti-hyperlipidaemia, Nephroprotective

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INTRODUCTION

Diabetes mellitus is a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, protein and fat metabolism resulting from defects in insulin secretion, insulin action or both. India is widely considered the "Diabetes Capital of the World," with an estimated 100 million+ people living with diabetes and another 135+ million pre-diabetics, accounting for over 17% of global cases.[1,2] According to the World Health Organization (WHO), noncommunicable diseases (NCDs) accounted for 74% of deaths globally in 2019, of which, diabetes resulted in 1.6 million deaths, thus becoming the ninth leading cause of death globally.[3] In Ayurvedic literature the disease Prameha (DM) is described as one of the 'Haggadah' means difficult to treat by Sushrutacharya.

The increasing prevalence of the disease is attributed to genetic predisposition and lifestyle changes associated with modernization, including reduced physical activity, heightened stress, and sedentary behavior. Diabetes has a profound systemic impact, resulting in a broad spectrum of macrovascular and microvascular complications, with mortality representing one of the most serious outcomes. Moreover, emerging evidence suggests its association with nontraditional complications such as mental health disorders, cancer, disability, and liver disease.[4] Many oral hypoglycemic drugs are available on the market and have many side effects like hypoglycemia, weight gain, gastrointestinal disturbance, lactic acidosis and fluid retention.[5]

In Ayurveda, Prameha (correlated with diabetes mellitus) is considered a Tridoshaja Vyadhi, wherein all three Doshas are involved, with predominant visitation of Kappa Dosha. The etiological factors (Nida) primarily contribute to Kappa Pakora and subsequent metabolic derangement. The major causative factors include excessive intake of Kapha-promoting Amara such as Grama, Audaka, and Anura Mama (meat of domesticated, aquatic, and marshy animals), along with their derivatives like milk and curd. Consumption of Nave Dhanya (newly harvested grains), Gouda Vikruta A hara (jaggery-based preparations), and other heavy, unctuous, and difficult-to-digest foods further aggravate Kappa Dosha. Additionally, Mihara factors such as sedentary lifestyle (Avyayama), excessive sleep (At Nida), and lack of physical activity significantly contribute to disease manifestation.[6] The pathological process is initiated by the derangement of Meda and Mama Dhatu, resulting in their Abaddha (loose and unstructured) state. This facilitates the association of Bahudrava Kappa with these tissues. The vitiated Kappa, owing to its similar properties (Samanya Gun), spreads throughout the body and combines with Meda Dhatu, followed by Mama Dhatu, both of which are already increased due to continuous exposure to etiological factors. This interaction leads to excessive formation and accumulation of Kleda (pathological body fluid). Subsequently, due to the influence of gravity and the obstructive effect of Meda and Kleda, the Mutravaha Rotas (urinary channels) become vitiated and obstructed, resulting in abnormal urinary manifestations characteristic of Prameha. Thus, the disease manifests through the interplay of Nida, Dosha, and Dushya, with predominance of Kappa Dosha in its Drama state. Based on the dominance of specific Doshas, different clinical types of Prameha are observed. This Ayurvedic understanding closely parallels the modern concept of diabetes mellitus, particularly Type 2 diabetes, where

lifestyle factors, metabolic dysfunction, and systemic involvement play a crucial role.[7] Without Baht Abaddha, the nature of Meda and Mana, i.e., derangement of body structure there is no combination of Bahudrava Kappa to manifestation of Prameha.[8] Kaphaja Prameha is considered Madhya (curable), whereas Pittaja Prameha is Krichra Madhya (difficult to cure). Therefore, therapeutic interventions aimed at breaking the Samprapti (pathogenesis) of Kappa–Pittaja Prameha are of significant clinical importance.[9] Mamajjaka Ghana Vati, possessing Kappa–Pitta Shaman properties, may play a vital role in the management of Prameha. Owing to its potential to target the underlying Dosha imbalance, it can be considered as one of the drugs of choice, particularly in the early stages of the disease. Hence, the present review is undertaken to evaluate the therapeutic utility of Mamajjaka Ghana Vat in the management of Prameha.

MATERIAL AND METHOD :

The present review was undertaken to evaluate the antidiabetic potential of the Ayurvedic formulation Mamajjaka Ghana Vat. For this purpose, available clinical studies and research work related to this formulation were critically analyzed. In addition, an extensive literary review was conducted to understand its pharmacological actions and probable mechanism in the management of Prameha (diabetes mellitus). Data were collected from both classical Ayurvedic texts and contemporary scientific sources. Classical references were reviewed from authoritative texts such as Karaka Samhita, Sushruta Samhita, Ashtanga Hridaya, and Madhava Nida. Information was further supplemented from standard textbooks of Dravyaguna Vigyana, as well as authentic monographs approved by the Ministry of AYUSH, Government of India. A comprehensive search of electronic databases, including PubMed, Cochrane Library, Google Scholar, and general academic search engines, was performed to identify relevant research articles on Mamajjaka and its individual ingredients with specific reference to antidiabetic activity. Additional sources included Ayurvedic journals, health periodicals, published citations, postgraduate (MD/PhD) theses, and clinical notes from practicing Vaisyas. The collected data were systematically compiled and analyzed through tabulation and thematic categorization. Key parameters such as indications, dosage, formulations, pharmacological properties, phyto active constituents, experimental and clinical study models, and reported outcomes were reviewed and presented with appropriate references.

Result and Discussion

Mamajjaka Ghana Vati mainly used in the Gujarat for the management of diabetes since long years and shows good results and it is mentioned in the Bhaishajya Samhita of Gujarat state government book.

Ingredients

चतुःप्रस्थमितानि स्यान्नागरिकदलानि च ।
 सम्यग्यत्नेन संपिष्य स्थाप्यं चतुर्युगे जले ॥
 यावाष्कं ततो वर्द्धयेत् कुर्यात् च परिमालितम् ।
 चुल्यादावारोप्य मन्दाग्नौ पाच्यं संवासयेद् घनम् ॥
 स घनोऽष्टमिलो ग्राह्यः पिप्पली च तिक्तका च पिप्पली ।
 प्रत्येकं बलिमानं स्यात् जलैर्ज्ञानिभिरुह्यते ॥
 नागारिकघनस्येयं वटी वैद्येषु पूजिता ॥

“भेषजसंहिता”

Table 1: Ingredients of Mamajjaka Ghana Vati

Sr No	Ingredients	Botanical Name	Family	Parts	Chemical Constituents
1	Mamajjaka	<i>Enicostemma littorale</i> (Blume.)	Gentianacea	64 Parts	Alkaloids, Catechins, Saponins, Sterols, Triterpinoids, Phenolic Acids, Flavonoids and Xanthonenes. It also contains Minerals Like Iron, Potassium, Calcium, Silica, Phosphate, Chloride Sulphate and Carbonate ^[10] Oleic Acid, Swertiamarine.
2	Ativisha	<i>Aconitum heterophyllum</i> (Wall.)	Ranunculacea	1 Part	Atisine, Heteratisine, Starch, Heterophylline, Heterophyllidine, Heterophyllisine, Hetisine, Hetidine, Hetisinone, Isoatisine ^[11]
3	Katuka	<i>Picrorhizakurroa</i> (Royle ex Benth.)	Scrophulriaceae	1 Part	Picrorhizin, Kutkin, D – mannitol, Kutkiol, Kutaki sterol
4	Pippali	<i>Piper longum</i> (Linn.)	Piperaceae	1 Part	Piperine, Pipartine, Sesamin, Pipasterol, Piperlonguminin, Volatile oil

Table 2: Pharmacological Properties of Ingredients of Mamajjaka Ghana Vati

S. No	Ingredient	Rasa	Guna	Vipaka	Veerya
1	Mamajjaka	Tikta	Laghu, Ruksha	Katu	Ushna
2	Ativisha	Tikta, Katu	Laghu, Ruksha	Katu	Ushna
3	Katuka	Tikta	Laghu, Ruksha	Katu	Sheeta
4	Pippali	Katu	Laghu, Snigdha, Tikshna	Madhura	Anushnasheeta

Table 3: Doshaghnata, Rogaghnata and Karma of Ingredients of Mamajjaka Ghana Vati

S. No	Ingredient	Doshaghnata	Karma	Rogaghnata
1	Mamajjaka	Kapha pittashamaka	Deepana, Pachana, Yakrut-uttejaka, Shothahara,	Aamdosha, Krumiroga, Raktavikara,
			Pramehaghna, Kushthaghna, Lekhana, Vishaghna.	Madhumeha, Twakroga, Medoroga.
2	Ativisha	Kapha Pittashamaka	Deepana, Pachana, Grahi, Raktshodhaka, Shothahara, Stanyashodhaka, Vajikarana,	Agnimandya, Aamdosha, Raktavikara, Stanyavikara, Medoroga, Balroga.
3	Katuka	Kapha Pittahara	Rochana, Deepana, Yakrututtejaka, Pittasaraka, Pramehaghna, Raktashodhana, Lekhana	Agnimandya, Yakrutvikara, Raktavikara, Hrudroga, Prameha, Medoroga.
4	Pippali	Kapha Vatashamak, When Ardra then Vatakaphavardhak and Pittashamak	Raktotkleshaka, Jantughna, Shirovirechana, Medhya, Deepana, Yakrututtejaka, Raktavardhaka, Shwasahara.	Aruchi, Udar, Yakrutvikara, Pleehavruddhi, Pandu, Kshaya, Mutravikara, Daurbalya.

Table 4: Some Pharmacological Research Works on Ingredients of *Mamajjaka Ghana Vati*

Sr No	Ingredient	Activity Studied	Extract used	Animal Model/ Cell Line Study/ Clinical Trial
1	<i>Mamajjaka</i>	1. Glucose lowering effect of <i>Enicostemma littorale</i> Blume	Aqueous extract	alloxan induced diabetic rats ^[12]
		2. Hypolipidaemic and antioxidant effect of <i>Enicostemma littorale</i> Blume.	Aqueous extract	cholesterol fed rats ^[13]
		3. preventive effect of <i>Mamajjaka</i> on nerve function and oxidative stress in animal model of diabetic neuropathy	Methanolic extract	alloxan induced diabetic neuropathy male Charles foster rats ^[14]
		4. Antidiabetic activity and improves lipid profile	Hot and cold aqueous extract	Streptozotocin-induced type 1 diabetic rats ^[15]
2	<i>Ativisha</i>	1. Antioxidant and Nephroprotective Activities of <i>Aconitum heterophyllum</i> Root	Ethanolic extract	Glycerol induced acute renal failure in Rats ^[16]
		2. Hypolipidemic effect of methanol fraction of <i>Aconitum heterophyllum</i>	Ethanol Extract	Diet Induced Diabetic Rats ^[17]
		3. Antiulcer activity of <i>Aconitum heterophyllum</i>	Ethanol Extract	Albino wistar rat ^[18]
3	<i>Katuka</i>	1. Antidiabetic activity of standardized extract of <i>Picrorhizakurroa</i> in rat model of NIDDM	Aqueous Extract	Streptozotocin nicotinamide induced rat ^[19]
4	<i>Pippali</i>	1. Antidiabetic and antihyperlipidemic activity of <i>Piper longum</i> root	aqueous extract	STZ induced diabetic rats ^[20]
		2. Screening of antidiabetic and antihyperlipidemic potential of oil from <i>Piper longum</i> and piperine with their possible mechanism	Potential oil	STZ induced diabetic rats ^[21]

Table 5: Research works done on the formulation *Mamajjaka Ghana Vati*

Sr. No.	Study Name	Authors	Findings
1.	Single blind placebo controlled clinical evaluation of <i>Mamajjaka Ghana Vati</i> in <i>Prameha</i> with special reference Diabetes Mellitus	Shukla Amarnath, Shukla HM;	The trial drug (<i>Mamajjaka Ghana Vati</i>) and <i>Virechana Karma</i> showed significant result in the reduction of FBS, PPBS, along with the subjective parameters like excessive urination, excessive thirst, turbidity in urine, burning sensation in the palm and soles of body, excessive sweating, excessive hunger and tiredness. ^[22]
2.	Efficacy and safety of <i>Mamajjaka Ghana vati</i> in the treatment of type 2 diabetes mellitus: a prospective open label multi-center clinical study	Malalur Nagesh Shubhashree, Bikartan Das, Gopal Chandra Nanda, Gaddam Kumara Swamy, Sarada Ota5, Shashidhar Doddamani, Meda Mruthyumjaya Rao, Vimal Tewari, Baghwan Sahai Sharma, Shruti Khanduri, Rakesh Rana, Richa Singhal, Adarsh Kumar, Narayanam Srikanth.	Formulation has significant result in the chief complaints and improved Quality of Life on SF-36 scale. There were no significant changes in the hepatic and renal parameters. There is no such improvement on the Blood Sugar Level Parameters. ^[23]
3.	A clinical study on the Naimittika Rasayana effect of Silajatu and <i>Mamajjaka</i> in type-2 Diabetes Mellitus	Sanjai Kumar, Girish Singh, Ajai Kumar Pandey, Ram Harsh Singh	This study suggested that the selected drugs help in preventing or delaying the complication in DM. It shows significant relief in most of the symptoms. FBS shown better percentage fall than the PPBS. ^[24]
4.	Efficacy of <i>Enicostemma littorale</i> in Type 2 Diabetic Patients	Umesh M. Upadhyay and Ramesh K. Goyal	<i>E. littorale</i> provided amelioration of the hyperglycaemic and hyperinsulinaemic conditions of diabetic patients. It normalized
			hypertension and hyperlipidaemia, and provided some nephroprotection. In conclusion, <i>E. littorale</i> possess a significant antidiabetic action, which substantiated the traditional use. ^[25]
5.	Pharmaceutical standardization of <i>Mamajjaka</i> (<i>Enicostemma littorale</i> Auct. non BI) <i>Ghana</i>	Samir P. Tanna, BiswajyotiPatgiri, Vinay J. Shukla, and Pradeep K. Prajapati	The pharmaceutical standardization of this herb ensures the uniformity of the preparation, thereby proving its global acceptance. Physiochemical and phytochemical data as well as HPTLC, and microbial overload are essential parameters followed to develop the SOP. ^[26]

Table no 6: nearby correlation between Ayurveda and Modern literature

Ayurvedic Concept	Description	Modern Correlation (Diabetes Mellitus)
<i>Nidana</i>	Kapha aggravating diet & lifestyle	High-calorie diet, sedentary lifestyle
<i>Kapha Prakopa</i>	Increased heaviness, unctuousness, fluidity	Obesity, dyslipidemia, metabolic syndrome
<i>Bahudrava Avastha</i>	Increased fluidity of Kapha	Hyperglycemia, altered fluid metabolism
<i>Meda Dhatu Vriddhi</i>	Excess fat tissue	Adiposity, insulin resistance
<i>Mamsa Dhatu Dushti</i>	Muscle tissue involvement	Altered glucose uptake in muscles
<i>Abaddha Meda</i>	Loosened/deranged fat metabolism	Dysfunctional adipose tissue
<i>Kleda Vriddhi</i>	Excess pathological fluid	Polyuria, glycosuria
<i>Srotorodha</i>	Channel obstruction	Microvascular dysfunction, insulin resistance
<i>Mutravaha Srotas Dushti</i>	Urinary system involvement	Osmotic diuresis, glucosuria
<i>Prameha</i>	Spectrum of urinary/metabolic disorders	Type 2 Diabetes Mellitus

DISCUSSION

The present integrative review of classical Ayurvedic literature and contemporary scientific evidence indicates that Mamajjaka Ghana Vati possesses significant therapeutic potential in the management of Prameha (Type 2 Diabetes Mellitus). The formulation, primarily derived from Mamajjaka (*Enicostemma littoral*), is described in Ayurvedic texts as possessing Tikta Rasa, Laghu–Ruksha Guna, and Sheet Veerya, which contribute to its Kappa–Pitta Shaman properties and make it particularly effective in Kappa–Pittaja Prameha. From an Ayurvedic perspective, Prameha is a Tridoshaja Vyadhi with predominant involvement of Kapha Dosha, characterized by chronicity and a tendency to progress into

Madhumeha if inadequately managed. The disease involves derangement of Meda, Mama, and Kleda, along with impairment of Dhatvagni. Clinical features such as Bahuabaddha Meda–Mama, Sharirika Kleda Vriddhi, Prabhuta Mutrata, Avila Mutrata, and Pipas reflect the underlying metabolic dysfunction. In this context, Mamajjaka Ghana Vat, owing to its Deepana, Pachanga, Lekhana, Grayi, and Pramehaghna properties, acts at multiple levels of Samprapti, correcting Dhatvagni Mandy, reducing Abaddha Meda, and facilitating Kleda Shoshana. The predominance of Tikka and Catu Rasa, along with Laugh and Ruksha Gun, contributes to stabilization of Kappa and Pitta Dosha, reduction of excessive Meda Dhatu, and restoration of metabolic homeostasis. Additionally, its Yakrutottejaka (hepatostimulatory) effect may play a significant role in correcting metabolic disturbances, given the central role of hepatic function in glucose and lipid metabolism. From a modern biomedical perspective, Mamajjaka Ghana Vat demonstrates multifaceted pharmacological actions, including antihyperglycemic, antihyperlipidemic, antioxidant, and anti-inflammatory effects. Bioactive constituents such as swertiamarin, flavonoids, saponins, and alkaloids present in Mamajjaka contribute to improved glucose utilization, enhanced insulin sensitivity, and reduction of oxidative stress, a key factor implicated in β -cell dysfunction and diabetic complications.

Clinical and Experimental Evidence

Multiple studies support the therapeutic efficacy of Mamajjaka Ghana Vat and its ingredients:

- A study conducted by CRAS reported significant symptomatic relief, with 99.9% improvement in polydipsia, followed by reduction in giddiness (86.3%), polyphagia (82.5%), fatigue (81%), body ache (79%), and visual disturbances (78.5%). Additionally, improvement in quality of life (LOL) was observed using SF-36 assessment, although changes in blood glucose levels were comparatively modest.
- Clinical observations by Amaranth Shula demonstrated improvement in classical Prameha Lakshanas, including Prabhuta Mutrata (64.10%), Pipasa (59.25%), and Kshudha (50%). Objective parameters showed reduction in fasting blood sugar (53.12%) and postprandial blood sugar (52.94%), with enhanced outcomes following Shoshana therapy.
- A study by Mesh Upadhyay reported significant reduction in blood glucose levels (from 205.4 ± 10.2 mg/dl to 150.6 ± 6.8 mg/dl), along with improvement in serum insulin, lipid profile, blood pressure, and renal parameters. Reduction in glucosuria and improvement in HDL levels further indicate metabolic correction.
- Experimental studies have demonstrated that *Enicostemma littoral* enhances insulin secretion, possibly through β -cell stimulation and increased insulin gene expression, along with improved peripheral glucose utilization.
- The antioxidant properties of the formulation help counter oxidative stress, a major contributor to diabetic complications, thereby providing protective effects against neuropathy, nephropathy, and hepatopathy.

Mechanism of Action

Ayurvedic Perspective

The action of *Mamajjaka Ghana Vati* can be understood through its effects on *Dosha*, *Dushya*, *Agni*, and *Srotas*:

- *Kapha–Pitta Shamana*: Balances the important causative *Dosha* involved in *Prameha*
- *Kleda Shoshana*: Reduces pathological fluid accumulation
- *Meda Dhatu Shamana*: Corrects lipid metabolism and reduces adiposity
- *Agni Deepana*: Improves metabolic activity at *Jatharagni* and *Dhatvagni* levels
- *Srotoshodhana*: Removes obstruction in *Mutravaha Srotas*
- *Rasayana* Effect: Improves *Ojas* and overall tissue integrity
- *Yakrutottejaka*: Improves the function of liver to corrects metabolism

It is also effective in *Madhumeha*, particularly in *Avaranajanya Samprapti*, where *Kapha–Pitta* obstruction plays a key role.

Modern Scientific Perspective

The pharmacological mechanisms include:

- Antihyperglycemic action: Enhances glucose uptake and reduces hepatic glucose output
- Insulinotropic effect: Stimulates insulin secretion and improves β -cell function
- Insulin sensitization: Reduces insulin resistance
- Enzyme inhibition: Decreases α -amylase and α -glucosidase activity
- Antioxidant action: Reduces oxidative stress and cellular damage
- Anti-inflammatory effect: Modulates chronic inflammation
- Hypolipidemic activity: Improves lipid profile and reduces cardiovascular risk
- Organ protection: Prevents hepatic and renal damage

Role of Individual Ingredients

- *Mamajjaka (Enicostemma littorale)*: Antihyperglycemic, insulinotropic, antioxidant; improves lipid metabolism (swertiamarin-mediated action)
- *Katuki (Picrorhiza kurroa)*: Hepatoprotective, hypolipidemic; enhances insulin secretion and liver function
- *Ativisha (Aconitum heterophyllum)*: Reduces *Meda* and *Kapha*; exhibits nephroprotective

and anti-inflammatory actions

- Pippali (*Piper longum*): *Rasayana*, enhances bioavailability, improves glucose utilization, and corrects *Dhatu metabolism*

Comparison with Standard Antidiabetic Drugs

The management of Type 2 Diabetes Mellitus using conventional pharmacotherapy primarily involves agents such as metFORMIN, sulfonylureas, DPP-4 inhibitors, SGLT2 inhibitors, and insulin, which act through specific biochemical pathways to achieve glycemic control. While these drugs are effective in lowering blood glucose levels, their long-term use is often associated with limitations such as adverse effects, risk of hypoglycemia, reduced patient compliance, and limited impact on disease progression and associated metabolic disturbances.

In contrast, Mamajjaka Ghana Vat offers a multidimensional and systems-based approach, targeting the underlying Samprapti of Prameha. Unlike conventional drugs that act on isolated pathways, this formulation modulates Dosha, Dushya, Agni, and Rotas, thereby addressing both metabolic dysfunction and systemic imbalance. While drugs such as metFORMIN primarily reduce hepatic glucose production and improve insulin sensitivity, and sulfonylureas stimulate insulin secretion, they do not adequately address associated conditions such as dyslipidemia, oxidative stress, and tissue-level derangement. Mamajjaka Ghana Vat, on the other hand, demonstrates simultaneous antihyperglycemic, antihyperlipidemic, antioxidant, and anti-inflammatory actions, offering broader metabolic correction. Additionally, its ability to correct Dhatvagni Mandy and Kleda Vriddhi parallels modern concepts of metabolic dysfunction and fluid imbalance, thereby targeting the core pathology of insulin resistance. Clinical evidence suggests that while conventional drugs may provide rapid glycemic control, Mamajjaka Ghana Vat offers gradual and sustained improvement, particularly in subjective symptoms and quality of life. However, it is important to note that its glucose-lowering effect may be less pronounced when used as monotherapy in advanced cases, indicating its optimal role in early-stage disease or as an adjunct to conventional therapy. Moreover, the safety profile of Mamajjaka Ghana Vat appears favorable, with minimal reported adverse effects, in contrast to gastrointestinal disturbances, hypoglycemia, and other side effects associated with modern antidiabetic drugs.

CONCLUSION

Thus, the evidence suggests that Mamajjaka Ghana Vat provides a holistic and integrative therapeutic approach, aligning with both Ayurvedic principles and modern pathophysiological understanding. Its incorporation into diabetes management, particularly in early-stage disease and metabolic syndrome, may enhance clinical outcomes, reduce complications, and improve patient quality of life.

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