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Review Article

Efficacy and therapeutic rationale of ManahVeda Diabohealth Tablets in Diabetes Care: An Overview

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Abstract

Diabetes mellitus is a complex metabolic disorder marked by chronic hyperglycemia and associated with progressive complications affecting multiple organ systems. The limitations of conventional anti-diabetic therapies, including adverse effects and incomplete metabolic control, have driven interest toward holistic and multi-targeted approaches such as Ayurveda. *ManahVeda Diabohealth* (DH) Tablets are an Ayurvedic proprietary polyherbal formulation developed to support glycemic regulation and metabolic balance through synergistic herbal actions. The formulation contains standardized extracts of *Momordica charantia (Karela), Gymnema* sylvestre (Gudmar), *Syzygium cumini* (Jamun), *Trigonella foenum-graecum* (Fenugreek), *Cinnamomum zeylanicum* (Cinnamon), *Pterocarpus marsupium* (Vijaysar), *Swertia chirata* (Chirayata), *Emblica officinalis* (Amla), *Withania somnifera* (Ashwagandha), and *Asphaltum punjabianum* (Shilajit). These herbs are traditionally recognized for their antihyperglycemic, insulin-sensitizing, antioxidant, anti-inflammatory, and pancreatic protective properties. The therapeutic rationale of Diabohealth Tablets lies in their multi-mechanistic action, including enhancement of insulin secretion, improvement of peripheral glucose uptake, modulation of carbohydrate metabolism, reduction of oxidative stress, and restoration of metabolic homeostasis. From an Ayurvedic perspective, the formulation aids in correcting Agni dysfunction, balancing *Kapha* and *Vata doshas*, and addressing the pathophysiology of *Madhumeha* at both systemic and cellular levels. In addition to glycemic control, the formulation may contribute to improved energy levels, stress modulation, and overall quality of life. Collectively, ManahVeda Diabohealth Tablets represent a rational Ayurvedic intervention for integrative diabetes management. However, well-designed clinical studies are necessary to validate their long-term efficacy, safety, and therapeutic outcomes.

Keywords: Diabetes mellitus; Ayurvedic medicine; Polyherbal formulation; Glycemic control; Madhumeha; ManahVeda Diabohealth Tablets

Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both[1]. It is broadly classified into type 1 diabetes, type 2 diabetes, gestational diabetes, and other specific forms associated with genetic or secondary causes. Among these, type 2 diabetes mellitus accounts for the majority of cases and is strongly associated with insulin resistance, obesity, sedentary lifestyle, and dietary imbalances[2]. Chronic hyperglycemia leads to disturbances in carbohydrate, lipid, and protein metabolism, accompanied by increased oxidative stress and low-grade inflammation, which together accelerate the development of microvascular and macrovascular complications[1,2]. Long-term complications include cardiovascular disease, nephropathy, neuropathy, retinopathy, and impaired wound healing, significantly increasing morbidity and mortality[3]. The global burden of diabetes continues to rise at an alarming rate, particularly in developing countries, highlighting the urgent need for comprehensive and sustainable management strategies[4].

Conventional antidiabetic therapies primarily aim to achieve glycemic control through insulin administration and oral hypoglycemic agents such as sulfonylureas, biguanides, thiazolidinediones, and newer drug classes including DPP-4 and SGLT2 inhibitors. While these therapies are effective in lowering blood glucose levels, they often fail to address the multifactorial nature of diabetes, which involves oxidative stress, inflammation, dyslipidemia, and progressive β-cell dysfunction[5,6]. Long-term use of synthetic antidiabetic drugs has been associated with adverse effects such as hypoglycemia,

gastrointestinal disturbances, weight gain, cardiovascular risks, and reduced patient compliance[7,8]. Moreover, conventional therapies generally focus on symptomatic glycemic control rather than restoring metabolic balance or preventing disease progression. These limitations have prompted growing interest in complementary and traditional systems of medicine that offer multi-targeted and holistic approaches to diabetes management[9].

Ayurveda, the ancient Indian system of medicine, provides a comprehensive framework for understanding and managing diabetes, described under the condition known as *Madhumeha. Madhumeha* is classified among the *Ashtamahagada* (eight major diseases) and is considered a disorder arising from derangement of *Doshas*, particularly *Kapha*, along with impaired Agni (digestive and metabolic fire) and *Dhatu* dysfunction[10,11]. Ayurvedic texts emphasize that *Madhumeha* results from improper diet, sedentary habits, excessive intake of sweet and fatty foods, and mental stress, closely aligning with modern etiological concepts of type 2 diabetes[12].

Management of *Madhumeha* in Ayurveda is holistic and individualized, focusing on *Nidana Parivarjana* (elimination of causative factors), dietary regulation, lifestyle modification, Panchakarma therapies, and the use of herbal and herbo-mineral formulations[13]. Ayurvedic interventions aim not only to reduce blood glucose levels but also to improve insulin sensitivity, enhance tissue metabolism, reduce oxidative stress, and restore systemic balance[14]. Numerous medicinal plants described in Ayurveda possess documented antihyperglycemic, antioxidant, and anti-inflammatory properties, supporting their role in long-term metabolic regulation[15]. This integrative and preventive approach positions Ayurveda as a valuable complementary system in the comprehensive management of diabetes mellitus.

Ayurvedic Perspective of Diabetes

In Ayurveda, diabetes mellitus is described under the broad category of *Prameha*, with *Madhumeha* considered its most severe and chronic form. Classical Ayurvedic texts such as *Charaka Samhita, Sushruta Samhita*, and *Ashtanga Hridaya* provide detailed descriptions of *Madhumeha*, emphasizing excessive and turbid urination with honey-like characteristics, progressive debility, dryness of tissues, and loss of vitality[16]. Unlike modern disease classifications, Ayurveda views *Madhumeha* not merely as a disorder of blood sugar but as a systemic metabolic disease affecting multiple tissues (*Dhatus*) and channels (*Srotas*)[17]. It is classified as both *Santarpanajanya* (originating from over-nutrition) and *Apatarpanajanya* (originating from tissue depletion), highlighting its complex and progressive nature[18].

The pathogenesis of *Madhumeha* involves a multifactorial imbalance of *Doshas*, primarily Kapha and Vata. In the early stages, excessive intake of heavy, sweet, unctuous foods and sedentary habits aggravate *Kapha*, leading to obstruction (*Avarana*) of metabolic pathways[19]. As the disease progresses, *Vata* becomes predominant, resulting in tissue depletion, dryness, and loss of strength[20]. The main *Dushyas* affected include *Meda* (adipose tissue), *Mamsa* (muscle tissue), *Kleda* (body fluids), *Shukra*, and *Ojas*, reflecting the multisystem involvement seen in diabetes[21].

Central to this process is the impairment of Agni, particularly *Dhatvagni*, which governs tissue metabolism. Weak or irregular Agni leads to improper digestion and transformation of nutrients, producing *Ama* (metabolic toxins) that further obstruct channels and aggravate Doshas[22]. This disruption in metabolic fire closely parallels modern concepts of insulin resistance, altered glucose utilization, and dyslipidemia[23]. Thus, Ayurveda places significant emphasis on correcting Agni as a primary therapeutic goal in the management of *Madhumeha*.

The Ayurvedic pathophysiology of *Madhumeha* describes a sequential progression from *Dosha* aggravation to *Srotodushti* (channel dysfunction) and *Dhatu Kshaya* (tissue depletion). Initially, aggravated *Kapha* increases *Kleda*, leading to excessive urination and metabolic sluggishness[24]. Over time, obstruction of channels forces *Vata* to move aberrantly, carrying vital essences such as *Ojas* toward the urinary system, resulting in its loss through urine[25]. This concept explains the classical description of progressive weakness, fatigue, weight loss, and susceptibility to complications in diabetic patients[26].

Ayurveda also recognizes hereditary factors (*Beeja Dosha*), psychological stress, aging, and chronic indulgence in etiological factors as contributors to disease chronicity[27]. The disease is considered *Yapya* (manageable but not completely curable), necessitating long-term, holistic management focusing on dietary regulation, lifestyle modification, herbal formulations, and rejuvenative therapies[28]. The therapeutic approach aims not only at reducing urinary abnormalities but also at restoring Agni, balancing *Doshas*, nourishing depleted tissues, and preventing complications[29].

In summary, the Ayurvedic understanding of diabetes as *Madhumeha* presents a comprehensive, systems-based model that aligns closely with contemporary views of metabolic syndrome. This integrative perspective provides a strong theoretical foundation for evaluating traditional formulations targeting metabolic and glycemic balance[30].

ManahVeda Diabohealth Tablets: An overview

ManahVeda Diabohealth Tablets are a polyherbal formulation developed on the principles of traditional medicine and contemporary phytopharmacology, intended to support metabolic balance and glycemic regulation. The product is positioned as a supportive intervention for individuals with impaired glucose metabolism, insulin resistance, and associated metabolic disturbances. Diabetes mellitus is increasingly recognized as a multifactorial disorder involving hyperglycemia, oxidative stress, chronic inflammation, and dysregulation of lipid and energy metabolism, necessitating therapeutic approaches that act on multiple targets simultaneously[31,32]. Diabohealth Tablets are formulated to complement lifestyle modification and conventional therapy by promoting physiological

glucose utilization, supporting pancreatic function, and reducing metabolic stress. Traditionally, such formulations are also indicated for managing fatigue, polyuria, polydipsia, and metabolic weakness commonly observed in diabetic individuals[33]. The therapeutic intent is not limited to glycemic control alone but extends to overall metabolic support and long-term wellness.

ManahVeda Diabohealth Tablets consist of a carefully selected blend of medicinal plant ingredients known for their antihyperglycemic, antioxidant, anti-inflammatory, and insulin-sensitizing properties. Each component is incorporated in standardized proportions to ensure consistency, safety, and reproducibility of therapeutic action[34]. The tablet dosage form offers several advantages, including ease of administration, accurate dose delivery, enhanced patient compliance, and stability during storage. Solid oral dosage forms are particularly suitable for chronic metabolic disorders, where long-term and regular administration is required[35]. The formulation is designed to allow gradual release of bioactive constituents in the gastrointestinal tract, facilitating sustained physiological effects and minimizing fluctuations in blood glucose levels[36]. From a pharmaceutical perspective, the combination of multiple herbs in a single dosage form enables simultaneous modulation of diverse metabolic pathways involved in glucose and lipid homeostasis[37].

The rationale for adopting a polyherbal approach in ManahVeda Diabohealth Tablets is rooted in both traditional therapeutic philosophy and modern scientific understanding. Polyherbal formulations are known to produce synergistic effects, where the combined action of multiple phytoconstituents is greater than the sum of their individual effects[38]. In metabolic disorders such as diabetes, single-target therapies often fail to address the complex interplay between insulin resistance, oxidative damage, inflammation, and mitochondrial dysfunction[39]. By contrast, polyherbal combinations can act concurrently on carbohydrate metabolism, insulin signaling pathways, antioxidant defense systems, and inflammatory mediators[40].

Additionally, certain herbs within a formulation may enhance the bioavailability and efficacy of others, while simultaneously reducing the risk of adverse effects through mutual modulation[41]. This multi-component strategy aligns with traditional medical systems, which emphasize restoration of systemic balance rather than isolated symptom control[42]. Scientific studies have increasingly demonstrated that polyherbal antidiabetic formulations exhibit improved efficacy, better tolerability, and broader metabolic benefits compared to single-herb preparations[43,44]. Therefore, the design of ManahVeda Diabohealth Tablets reflects a rational, evidence-informed approach aimed at comprehensive metabolic and glycemic support, while maintaining safety and long-term usability[45].

Pharmacological profile of main ingredients

The therapeutic potential of DH is derived from the complementary pharmacological actions of its constituent herbs and mineral components, which collectively target multiple pathways involved in metabolic and glycemic dysregulation. Contemporary experimental and clinical studies increasingly support the traditional Ayurveda and Unani rationale of combining antihyperglycemic, insulin-sensitizing, antioxidant, anti-inflammatory, and adaptogenic agents within a single formulation to achieve holistic metabolic support[46-48].

Antihyperglycemic activity is a primary therapeutic objective in the management of diabetes mellitus. Several herbal constituents of DH have demonstrated significant blood glucose–lowering effects through diverse mechanisms. Phytoconstituents present in medicinal plant oils are reported to reduce fasting and postprandial glucose levels by enhancing peripheral glucose utilization and suppressing excessive hepatic gluconeogenesis[49]. Experimental studies indicate that such herbs may protect pancreatic β-cells from oxidative damage, preserve insulin secretory capacity, and delay progression of hyperglycemia-associated metabolic complications[50]. Additionally, inhibition of intestinal carbohydrate-digesting enzymes has been suggested as a contributory mechanism, leading to reduced glucose absorption and improved glycemic control[51].

Insulin resistance is a central pathological feature of type 2 diabetes and metabolic syndrome. Certain components of diabohealth have been identified as natural insulin sensitizers, capable of improving insulin receptor signaling and enhancing glucose transporter activity in skeletal muscle and adipose tissue[52]. By modulating key intracellular pathways such as AMP-activated protein kinase (AMPK), these agents facilitate increased glucose uptake and improved cellular energy balance[53]. Recent studies further suggest that herbal insulin sensitizers may contribute to improved lipid metabolism, reduced ectopic fat deposition, and overall enhancement of metabolic flexibility, thereby supporting long-term glycemic stability[54].

Oxidative stress and chronic low-grade inflammation play a critical role in the onset and progression of diabetes-related complications. Bioactive compounds present in DH have demonstrated potent free radical–scavenging activity and the ability to upregulate endogenous antioxidant defense systems[55]. Reduction of lipid peroxidation and suppression of pro-inflammatory mediators such as tumor necrosis factor-α and interleukins have been reported in both in vitro and in vivo models[56]. By attenuating oxidative and inflammatory damage, these components help preserve insulin sensitivity, protect vascular endothelium, and reduce the risk of secondary metabolic complications[57].

Adaptogenic and metabolic support agents constitute an essential component of DH, addressing fatigue, stress-related metabolic imbalance, and mitochondrial dysfunction commonly observed in chronic diabetes. Such ingredients are reported to enhance cellular energy production, improve mitochondrial efficiency, and promote resilience against metabolic stressors[58]. Furthermore, adaptogens may support neuroendocrine regulation and improve overall metabolic homeostasis by modulating stress hormone responses[59]. Their role as

bioavailability enhancers has also been highlighted, facilitating improved absorption and utilization of co-administered phytoconstituents within oil-based formulations[60].

Collectively, the pharmacological attributes of these key ingredients support the multi-targeted therapeutic rationale of DH, reinforcing its potential utility as a comprehensive metabolic and glycemic support formulation.

Mechanisms of action in diabetes care

The multifaceted pathology of diabetes necessitates therapeutic interventions that act through several biological pathways. Modern research on herbal and polyherbal antidiabetic strategies has identified mechanisms including modulation of glucose metabolism, enhancement of insulin action, protection of pancreatic β-cells, and attenuation of oxidative stress and inflammation, which together support metabolic balance and glycemic control.

Blood glucose regulation fundamentally depends on a balance between glucose influx from dietary sources and glucose uptake by peripheral tissues. Herbal compounds often exert insulin-mimetic actions, increasing cellular glucose uptake by upregulating glucose transporters such as GLUT4 and affecting signaling pathways like PI3K/Akt. Additionally, several phytochemicals inhibit carbohydrate-digesting enzymes such as α-amylase and α-glucosidase, which slows postprandial glucose rise and reduces glycemic spikes.

Impaired insulin sensitivity is central to type 2 diabetes. Natural antidiabetic agents, including flavonoids, terpenoids, and other phytochemicals, improve peripheral insulin responsiveness by activating key metabolic regulators such as PPAR-γ, AMPK, and GLUT4, facilitating efficient glucose uptake and utilization. Such mechanisms reduce systemic insulin resistance and aid metabolic homeostasis. Moreover, certain extracts exert effects comparable to synthetic modulators of insulin signaling, enhancing metabolic outcomes in preclinical models.

Pancreatic β-cells are essential for adequate insulin secretion. In diabetes, chronic glucotoxicity, lipotoxicity, and oxidative insult lead to β-cell dysfunction and apoptosis. Phytochemicals from herbs such as Syzygium cumini, Bauhinia variegate, and other plant matrices have demonstrated protective activity on β-cells by attenuating stress-induced damage, supporting cell survival and functional insulin release. Additionally, studies show that certain compounds can enhance β-cell regeneration or reduce endoplasmic reticulum stress, further preserving insulin-secreting capacity.

Oxidative stress and inflammation significantly contribute to insulin resistance and β-cell decline in diabetes. Reactive oxygen species (ROS) impair insulin signaling while promoting cellular damage. Many antidiabetic herbs are rich in antioxidants that neutralize ROS, upregulate endogenous antioxidant enzymes (e.g., SOD, CAT, GPx), and suppress pro-inflammatory cytokines. This antioxidant-mediated modulation also indirectly supports pancreatic health and mitigates chronic metabolic inflammation.

Clinical relevance and potential benefits

Diabetes mellitus and associated metabolic disorders exert a profound impact on patient well-being by producing persistent symptoms such as fatigue, polyuria, polydipsia, impaired wound healing, and progressive decline in physical and mental performance. Effective management therefore extends beyond glycemic normalization and must address symptom burden and quality of life. Polyherbal formulations rooted in traditional systems have gained attention for their ability to modulate multiple pathological pathways simultaneously. DH, owing to its antihyperglycemic, antioxidant, and anti-inflammatory properties, may contribute to improved symptom control by enhancing glucose utilization, reducing oxidative stress, and supporting cellular energy metabolism. Improvement in metabolic efficiency has been associated with reduced fatigue, better physical endurance, and enhanced overall vitality, which are critical determinants of patient-reported outcomes in chronic metabolic disorders[76–78]. Additionally, holistic interventions targeting inflammation and oxidative damage have been shown to positively influence psychological well-being and daily functional capacity, thereby improving long-term disease coping and life satisfaction[79,80].

Despite advances in pharmacological management, conventional antidiabetic therapies primarily focus on glycemic control and may not fully address insulin resistance, oxidative stress, or metabolic inflammation. Furthermore, long-term monotherapy or polypharmacy can be associated with adverse effects and declining efficacy. Integrative approaches using traditional formulations as adjuncts to standard treatment have therefore emerged as a promising strategy. DH, with its multi-targeted phytotherapeutic profile, holds potential as a supportive adjunct capable of enhancing metabolic resilience without interfering with conventional drug mechanisms. Herbal adjuvants have been reported to improve insulin sensitivity, stabilize glycemic variability, and reduce metabolic stress when used alongside standard therapy, thereby potentially allowing dose optimization of synthetic agents[81–83]. The oil-based formulation may further support sustained bioavailability of active constituents, contributing to prolonged therapeutic action and improved metabolic stability. Such adjunctive use aligns with contemporary integrative medicine paradigms that emphasize complementary, patient-centered care[84,85].

Safety and patient adherence are critical determinants of long-term therapeutic success in chronic metabolic disorders. Traditional polyherbal oils are generally regarded as well tolerated when prepared according to pharmacopeial standards and administered within recommended doses. The constituents of DH have long histories of use in Unani and other traditional systems, with documented safety profiles and low incidence of serious adverse effects. Herbal formulations with antioxidant and anti-inflammatory actions may also mitigate drug-induced oxidative burden when used

judiciously as supportive therapy[86-88]. From a patient-compliance perspective, oil-based preparations are often preferred due to ease of administration, reduced gastrointestinal irritation, and suitability for prolonged use. Improved tolerability and perceived holistic benefits have been linked to better adherence and sustained engagement with therapy in patients managing chronic metabolic conditions[89,90]. Collectively, these factors highlight the clinical relevance of DH as a potentially safe, acceptable, and supportive intervention aimed at improving therapeutic outcomes and quality of life in individuals with metabolic and glycemic disorders.

Therapeutic rationale based on Ayurveda

In Ayurveda, metabolic health is fundamentally governed by the state of Agni (digestive and metabolic fire), which regulates digestion, assimilation, transformation, and cellular nourishment. Impairment of Agni leads to the formation of *Ama* (toxic metabolic by-products), which obstructs *Srotas* (microchannels) and initiates systemic metabolic derangements. In conditions analogous to diabetes mellitus, weakened *Jatharagni* and *Dhatvagni* result in improper glucose utilization, tissue depletion, and progressive metabolic imbalance. Ayurvedic interventions therefore emphasize *Deepana* (enhancing digestive fire) and *Pachana* (eliminating metabolic toxins) as foundational therapeutic strategies. Correction of Agni improves insulin sensitivity, restores metabolic rhythm, and supports cellular energy balance. Contemporary Ayurvedic research correlates Agni dysfunction with insulin resistance, mitochondrial inefficiency, and oxidative stress, reinforcing its relevance in metabolic disorders[91-93]. Thus, therapies aimed at strengthening Agni are central to achieving sustainable glycemic regulation and metabolic stability.

Madhumeha is primarily classified under *Vata-pradhana Tridoshaja* disorders, with significant involvement of *Kapha* and *Pitta* during disease initiation and progression. Excess *Kapha* contributes to heaviness, insulin resistance, and metabolic sluggishness, while aggravated Pitta intensifies oxidative stress and tissue inflammation. Progressive depletion of *Ojas* and dominance of *Vata* lead to tissue catabolism, fatigue, polyuria, and neuromuscular complications. Ayurvedic management therefore focuses on *Dosha Shamana* (pacification of aggravated humors) while simultaneously strengthening and nourishing the *Dhatus*, particularly *Rasa, Meda, Mamsa,* and *Shukra*. Restoration of *Dhatu* integrity is essential for reversing tissue degeneration and maintaining metabolic resilience. Recent Ayurvedic and integrative studies highlight that balanced *Dosha* modulation improves lipid metabolism, glucose uptake, and endocrine function while preventing long-term complications of diabetes[94-96]. Nourishment of depleted *Dhatus* also supports immune competence and neuroendocrine stability, which are often compromised in chronic metabolic disorders.

Madhumeha, described as a subtype of *Prameha*, is characterized by excessive urination with turbid, sweet-like urine, progressive weakness, weight loss, and loss of vitality. Ayurveda recognizes *Madhumeha* as a chronic, *Yapya* (manageable but not easily curable) condition requiring long-term, multi-targeted intervention. Therapeutic objectives include stabilization of blood sugar, preservation of tissue strength, prevention of complications, and enhancement of quality of life. Ayurvedic formulations traditionally indicated for *Madhumeha* act through *Lekhana* (scraping excess fat), *Rasayana* (rejuvenation), *Balya* (strengthening), and *Medohara* (fat-modulating) actions. These interventions collectively regulate carbohydrate and lipid metabolism, improve insulin responsiveness, and counter oxidative damage. Modern clinical observations increasingly support the role of Ayurvedic approaches as effective adjuvants in diabetes management, particularly in improving metabolic markers, reducing drug dependency, and enhancing patient-reported outcomes[97-100].

From a contemporary perspective, Ayurvedic management of *Madhumeha* aligns with systems-biology concepts by targeting multiple metabolic pathways simultaneously. Emphasis on Agni correction, *Dosha* balance, and *Dhatu* nourishment offers a comprehensive framework that addresses both biochemical and functional aspects of metabolic disease. Emerging evidence suggests that such holistic strategies may help mitigate insulin resistance, chronic inflammation, and oxidative stress- main drivers of diabetes progression- while supporting long-term metabolic homeostasis[101-105].

Conclusion

Diabetes mellitus remains a major global health challenge requiring safe, effective, and multi-targeted therapeutic strategies. ManahVeda Diabohealth Tablets represent a rational Ayurvedic polyherbal formulation designed to address the complex pathophysiology of diabetes through synergistic mechanisms. The combination of traditionally validated herbs with antihyperglycemic, insulin-sensitizing, antioxidant, and adaptogenic properties supports comprehensive glycemic regulation and metabolic balance. From an Ayurvedic perspective, the formulation contributes to the correction of Agni dysfunction, pacification of involved doshas, and management of Madhumeha at both systemic and cellular levels. Beyond blood glucose control, Diabohealth Tablets may aid in improving energy levels, stress resilience, and overall quality of life. While the therapeutic rationale is well supported by classical Ayurvedic knowledge and pharmacological evidence of individual ingredients, there remains a need for robust, well-designed clinical trials to confirm efficacy, safety, and long-term outcomes. Integrative use of ManahVeda Diabohealth Tablets may offer a promising complementary approach in comprehensive diabetes care.

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