



## Review Article

# Diabetes and Erectile Dysfunction: Exploring the Ayurvedic Understanding of Madhumehaj Klaibya

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## Keywords

Madhumehaj Klaibya,  
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Mellitus Induced Erectile  
Dysfunction, Rasayana,  
Vajikarana.

## Abstract

**Background:** Erectile dysfunction (ED) is a common and early complication of diabetes mellitus, affecting over half of diabetic men. Ayurveda describes this condition as Madhumehaj Klaibya, arising from Vata–Kapha vitiation, Meda and Shukra Dhatu deterioration, and Ojas depletion. These concepts parallel modern mechanisms of diabetic ED, including endothelial dysfunction, neuropathy, oxidative stress, and impaired nitric oxide signaling. **Objective:** To critically analyze the Ayurvedic understanding of Madhumehaj Klaibya and correlate it with contemporary biomedical insights into diabetes-related ED, with emphasis on integrative therapeutic strategies. **Methods:** Classical Ayurvedic texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Bhavaprakasha) were reviewed to elucidate concepts of Klaibya and Madhumeha. Modern scientific literature from PubMed and the AYUSH Research Portal was analyzed to identify etiopathogenesis and management of diabetic ED. A comparative synthesis was undertaken. **Outcomes:** Ayurveda attributes Madhumehaj Klaibya to Kapha–Meda Avarana causing Vata dysfunction, Agnimandya, Shukra Dushti, and Ojas Kshaya—comparable to vascular insufficiency, oxidative damage, and hormonal imbalance. Experimental and clinical studies suggest that Rasayana and Vajikarana therapies (Ashwagandha, Shilajatu, Musali Pak, Gudmar, Gokshura) possess antioxidant, adaptogenic, and androgen-supportive effects. When integrated with PDE-5 inhibitors, hormonal therapy, and lifestyle modification, these approaches may improve metabolic control, nitric oxide bioavailability, and psychosexual well-being. **Conclusion:** Madhumehaj Klaibya demonstrates a strong conceptual convergence between Ayurveda and modern biology in diabetic ED. Integrative strategies combining Agnideepana, Srotoshodhana, Rasayana, and Vajikarana with contemporary care offer a holistic, evidence-informed framework. Further multicentric trials, formulation standardization, and biomarker-based validation are warranted.

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## 1. Introduction

Ayurveda describes diabetes mellitus as *Madhumeha*, a chronic metabolic disorder characterized by impaired glucose metabolism and inadequate insulin regulation. Diabetes mellitus represents a major global health challenge, with its prevalence increasing due to longer life expectancy, sedentary lifestyles, and reduced physical activity [1]. Persistent hyperglycemia results in several long-term complications, among which erectile dysfunction, referred to as *Klaibya* in Ayurveda, is a clinically significant yet underrecognized condition. Men with diabetes develop erectile dysfunction at a younger age and with greater

severity than non-diabetic individuals, with prevalence reported in a substantial proportion of affected patients [2].

The pathogenesis of diabetes-related erectile dysfunction is multifactorial. Chronic hyperglycemia induces vascular injury, autonomic neuropathy, endothelial dysfunction, oxidative stress, and psychological disturbances, collectively leading to impaired erectile function. These mechanisms reflect the systemic and progressive nature of diabetic complications [3].

In Ayurvedic literature, diabetes-associated erectile dysfunction is termed *Madhumehaj Klaibya*. Its pathogenesis is attributed to *Vata prakopa*, *Avarana* of *Kapha*, *Shukra dhatu kshaya*, and *Oja kshaya* [4]. Classical texts describe multiple forms of *Klaibya*, including *Doshaja*, *Sahaja*, *Vyadhija*, *Shukrakshaya*, and *Medoja*, based on etiological factors, all fundamentally linked to disturbances of *Shukra dhatu*. *Madhumehaj Klaibya* is best understood within the framework of *Doshaja* and *Vyadhija Klaibya*, indicating that chronic metabolic derangements adversely affect reproductive and psychological health [5].

Ayurvedic management emphasizes an individualized and holistic approach that includes *Shodhana* therapies such as *Virechana* and *Snehapana*, *Shamana* therapy using herbal formulations, and *Vajikarana* therapy aimed at reproductive rejuvenation. These interventions seek to restore doshic balance, nourish *Shukra dhatu*, enhance *Ojas*, and improve metabolic function [6]. In contrast, contemporary pharmacological agents primarily provide symptomatic relief and may be associated with limitations and adverse effects. Ayurvedic protocols integrate dietary regulation, lifestyle modification, *Panchakarma*, *Rasayana*, and *Vajikarana*, offering comprehensive management. With the rising prevalence of diabetes-associated erectile dysfunction, a transdisciplinary understanding of *Madhumehaj Klaibya* supports integrative strategies that address metabolic, psychological, and physiological dysfunctions [7].

## 2. Review of Literature

### 2.1 Classical Ayurvedic Review

#### 2.1.1 Terminology and Definitions

Ayurvedic literature defines *Klaibya* as the inability to achieve or maintain satisfactory sexual performance due to disturbances in *Shukra dhatu* and *Ojas*, thereby affecting both the physical and psychological dimensions of virility. *Madhumeha*, a subtype of *Prameha*, is characterized by *Kapha* and *Meda Avarana*, leading to *Vata prakopa* and *Ojas kshaya* [8]. Clinically, this manifests as polyuria, fatigue, and progressive tissue depletion. When these chronic metabolic disturbances involve *Shukra dhatu*, the condition progresses to *Madhumehaj Klaibya*, corresponding to diabetes mellitus-associated erectile dysfunction. This condition reflects a profound depletion of *Ojas* and a consequent decline in sexual vitality [9].

#### 2.1.2 Nidana (Etiology)

*Apathya ahara* and *vihara*, encompassing unwholesome dietary habits and inappropriate lifestyle practices, along with excessive intake of heavy, oily, and sweet foods, prolonged physical inactivity, and overindulgence in sexual activity, are recognized etiological factors for both *Klaibya* and *Madhumeha*. These factors aggravate *Kapha* and *Meda*, promote *Srotorodha* or obstruction of bodily channels, and impair the normal functioning of *Vata*, thereby disrupting the proper formation and nourishment of

*Shukra dhatu* [10].

Psychological factors such as *Chinta*, *Shoka*, and *Bhaya* are also emphasized in Ayurvedic texts, as they vitiate the *Manasika doshas*, namely *Rajas* and *Tamas*. This disturbance adversely affects mental equilibrium and contributes to *Manasika Klaibya*, or psychogenic erectile dysfunction, highlighting the integral role of psychological health in sexual function [11].

#### 2.1.3 Samprapti (Pathogenesis)

*Kapha* and *Meda Avarana* obstruct the normal movement of *Vata*, particularly *Apana* and *Vyana Vayu*, resulting in dysfunction of *Shukravaha* and *Medovaha srotas* [12]. This pathological process leads to *Dhatu kshaya* and *Agnimandya*, thereby impairing cellular metabolism and diminishing reproductive vitality. The depletion of *Ojas* may be conceptually correlated with endothelial dysfunction and heightened oxidative stress observed in diabetes mellitus, while *Vata kshaya* resembles neurovascular insufficiency that contributes to erectile dysfunction [13], [14].

#### 2.1.4 Lakshana (Clinical Features)

*Klaibya* is clinically manifested by loss of libido, absence or inadequacy of erection, reduced seminal volume, and persistent fatigue. *Madhumeha* presents with *Prabhuta mutrata* or excessive urination, *Pipasadhikya* or excessive thirst, *Kshaya* or emaciation, and *Daurbalya* or generalized weakness. When these conditions coexist, the clinical entity is described as *Madhumehaj Klaibya*, reflecting the simultaneous presence of sexual and metabolic dysfunction resulting from *Vata* and *Kapha* pathology accompanied by depletion of *Ojas* [15].

#### 2.1.5. Chikitsa (Principles of Management)

Ayurveda emphasizes *Shodhana* or bio purification, *Shamana* or palliative therapy, *Rasayana* or rejuvenation, and *Vajikarana* or aphrodisiac therapy as the principal components of management. *Shodhana* procedures such as *Virechana* and *Basti* help eliminate *Kapha* and *Meda* obstruction and restore the physiological balance of *Vata* [16].

*Rasayana* and *Vajikarana* therapies, including formulations containing *Ashwagandha*, *Kapikacchu*, *Shilajatu*, *Musali Pak*, and *Gokshuradi Guggulu*, are employed to replenish *Shukra dhatu*, enhance physical strength, and support metabolic homeostasis [17]. Lifestyle interventions such as *Sattvika ahara*, observance of *Brahmacharya*, and stress management through *Sattvavajaya chikitsa* complement pharmacological measures by addressing the psychogenic components of *Klaibya* and promoting overall wellbeing [18].

Multiple Ayurvedic herbs and formulations exhibit antihyperglycemic, antioxidant, endothelial-protective, neuroprotective, and androgen-supportive effects relevant to diabetes-associated erectile dysfunction, as summarized in Table 1 [19].

**Table 1:** Ayurvedic Herbs and Formulations Used in Madhumehaj Klaibya with Modern Pharmacological Evidence.

S. No.	Ayurvedic Herb/Formulation	Bioactive Constituents	Experimentally / Clinically Reported Evidence Relevant to DMED	References
1.	Ashwagandha ( <i>Withania somnifera</i> )	Withanolides	Improves testosterone, reduces oxidative stress, neuroprotective, improves erectile function	[20], [21]
2.	Shilajatu	Fulvic acid, humic substances	Enhances mitochondrial bioenergetics, improves glycemic control, increases androgen levels	[22]
3.	Kapikacchu ( <i>Mucuna pruriens</i> )	L-DOPA	Improves libido, dopaminergic signaling, spermatogenesis	[23], [24]
4.	Gokshura ( <i>Tribulus terrestris</i> )	Protodioscin	Enhances nitric oxide signaling and endothelial function	[25], [26]
5.	Safed Musli ( <i>Chlorophytum borivillianum</i> )	Saponins	Improves sexual performance, antioxidant, androgen-supportive	[27]
6.	Gudmar ( <i>Gymnema sylvestre</i> )	Gymnemic acids	Antihyperglycemic, improves insulin sensitivity	[28], [29]
7.	Shatavari ( <i>Asparagus racemosus</i> )	Steroidal saponins	Adaptogenic, antioxidant, hormonal balance	[30]
8.	Bala ( <i>Sida cordifolia</i> )	Alkaloids	Neuroprotective, improves neuromuscular transmission	[31]
9.	Vidarikanda ( <i>Pueraria tuberosa</i> )	Isoflavonoids	Improves insulin sensitivity, antioxidant	[32], [33]
10.	Yashtimadhu ( <i>Glycyrrhiza glabra</i> )	Glycyrrhizin	Anti-inflammatory, endothelial protective	[34], [35]
11.	Amalaki ( <i>Emblica officinalis</i> )	Polyphenols, vitamin C	Potent antioxidant, endothelial support	[36], [37]
12.	Haritaki ( <i>Terminalia chebula</i> )	Chebulinic acid	Anti-inflammatory, metabolic regulator	[38]
13.	Bibhitaki ( <i>Terminalia bellirica</i> )	Tannins	Hypolipidemic, antioxidant	[39]
14.	Triphala	Polyphenols	Improves glycemic control and endothelial health	[40], [41]
15.	Guggulu ( <i>Commiphora mukul</i> )	Guggulsterones	Improves lipid metabolism, anti-inflammatory	[42]
16.	Arjuna ( <i>Terminalia arjuna</i> )	Flavonoids	Improves vascular tone and endothelial function	[43], [44]
17.	Punarnava ( <i>Boerhaavia diffusa</i> )	Alkaloids	Improves renal and vascular function	[45]
18.	Daruharidra ( <i>Berberis aristata</i> )	Berberine	Improves insulin sensitivity and NO signaling	[46], [47]
19.	Haridra ( <i>Curcuma longa</i> )	Curcuminoids	Antioxidant, anti-inflammatory, endothelial protection	[48], [49]
20.	Shunthi ( <i>Zingiber officinale</i> )	Gingerols	Improves circulation and insulin sensitivity	[50], [51]
21.	Tvak ( <i>Cinnamomum verum</i> )	Cinnamaldehyde	Improves insulin sensitivity	[52]
22.	Methi ( <i>Trigonella foenum-graecum</i> )	Diosgenin	Improves testosterone and glycemic control	[53], [54]
23.	Lashuna ( <i>Allium sativum</i> )	Allicin	Improves nitric oxide bioavailability	[55]
24.	Maricha ( <i>Piper nigrum</i> )	Piperine	Enhances bioavailability, antioxidant	[56], [57]
25.	Pippali ( <i>Piper longum</i> )	Piperlongumine	Improves circulation and metabolism	[58]
26.	Brahmi ( <i>Bacopa monnieri</i> )	Bacosides	Neuroprotective, autonomic regulation	[58], [59]
27.	Mandukaparni ( <i>Centella asiatica</i> )	Triterpenoids	Improves microcirculation	[60]
28.	Ashwagandha	Polyherbal	Improves vitality and hormonal balance	[61], [62]

	Rasayana			
29.	Musali Pak	Polyherbal	Improves erectile function and libido	[63], [64]
30.	Gokshuradi Guggulu	Polyherbal	Supports urinary, metabolic, and reproductive health	[65], [66]

## 2.2 Contemporary Medical Review

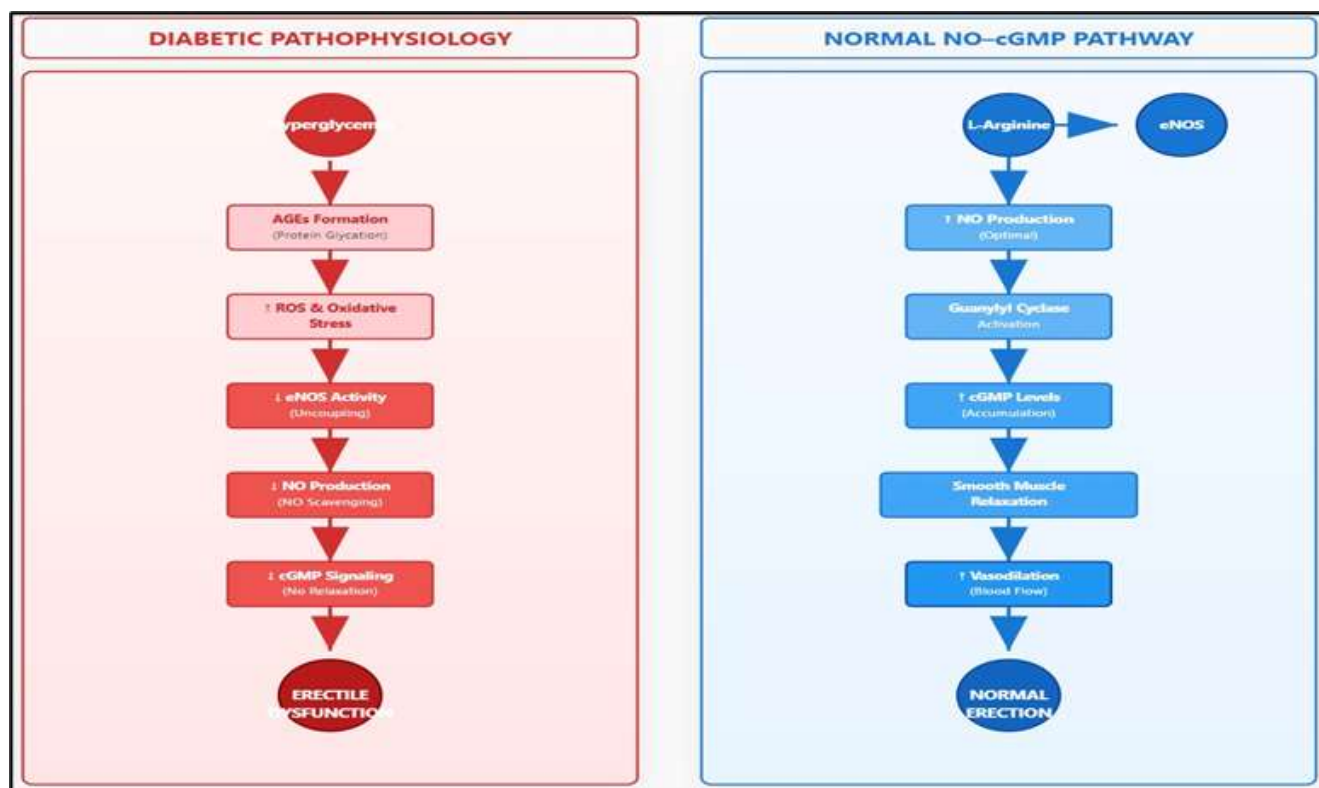
### 2.2.1 Pathophysiology

Erectile dysfunction is a common chronic complication of diabetes mellitus, affecting approximately thirty five to seventy five percent of men with long standing disease and typically manifesting nearly a decade earlier than in non diabetic populations [67]. The underlying pathophysiology is multifactorial and involves vascular, neurological, endocrine, and psychogenic mechanisms. Persistent hyperglycemia promotes non enzymatic glycation of vascular and neural proteins, leading to endothelial dysfunction, microangiopathy, and autonomic neuropathy [68].

Oxidative stress plays a central role in this process, as sustained elevation of blood glucose generates excessive reactive oxygen species. These reactive species reduce nitric oxide bioavailability, impair endothelial nitric oxide synthase activity, and compromise vasodilation within the corpus cavernosum [69]. In addition, the accumulation of advanced glycation end products increases vascular stiffness and promotes cavernosal fibrosis. Insulin resistance and reduced testosterone levels further aggravate vascular and neural injury. Collectively, these pathological alterations result in impaired relaxation of penile smooth muscle, inadequate cavernosal blood filling, and diminished erectile

rigidity [70].

Figure 1 Schematic representation of nitric oxide and cyclic guanosine monophosphate signaling in normal erectile function and diabetic erectile dysfunction [71]. The diabetic pathway illustrates impaired nitric oxide production from endothelial and neuronal nitric oxide synthase due to chronic hyperglycemia, oxidative stress, advanced glycation end products, and reduced synthase activity. This results in diminished activation of soluble guanylate cyclase, reduced cyclic guanosine monophosphate synthesis, and defective protein kinase G signaling, leading to increased intracellular calcium, corpus cavernosum smooth muscle contraction, and erectile failure [72]. In contrast, the normal pathway demonstrates intact neural stimulation with adequate nitric oxide release, efficient cyclic guanosine monophosphate generation, and effective protein kinase G activation, culminating in smooth muscle relaxation and penile erection [73]. The table summarizes key diabetic mechanisms including endothelial dysfunction, insulin resistance, reactive oxygen species mediated cellular injury, neuropathy related loss of neural signaling, and Rho kinase mediated smooth muscle contraction, all contributing to vascular, neural, and corporal impairment in diabetes [74].



**Figure 1:** Pathophysiology and insight of Ayurvedic drugs in DMED.



### 2.2.2 Clinical and Experimental Research

Clinical and experimental evidence supports the vascular neurogenic hypothesis of diabetic erectile dysfunction. A comprehensive meta-analysis involving more than twelve thousand men with diabetes demonstrated a markedly higher prevalence of erectile dysfunction compared with non-diabetic controls [75]. Experimental animal models further corroborate these findings by showing reduced nitric oxide cyclic guanosine monophosphate signaling, decreased endothelial nitric oxide synthase expression, and increased oxidative stress within cavernosal tissue. Inflammatory mediators such as tumor necrosis factor alpha and interleukin six have also been implicated in mitochondrial dysfunction and endothelial apoptosis in penile tissue, thereby aggravating vascular and neural impairment [76], [77].

Therapeutic strategies aimed at restoring nitric oxide signaling and achieving optimal glycemic control have demonstrated clinically meaningful benefits. Evidence from clinical studies indicates that strict glycemic regulation, reflected by glycated hemoglobin levels below seven percent, significantly delays the onset and progression of erectile dysfunction [78]. In addition, antioxidant therapy and L arginine supplementation have been shown to improve erectile function scores in men with diabetes, highlighting the importance of targeting oxidative stress and endothelial dysfunction in the management of diabetic erectile dysfunction [79].

### 2.2.3 Current Management

Contemporary management of diabetic erectile dysfunction emphasizes a multimodal therapeutic approach that integrates pharmacological, hormonal, mechanical, and lifestyle interventions. Phosphodiesterase type 5 inhibitors such as sildenafil, tadalafil, and vardenafil enhance nitric oxide mediated cyclic guanosine monophosphate signaling, thereby facilitating penile vasodilation [80], [81]. However, their therapeutic efficacy is often diminished in men with diabetes because of underlying endothelial

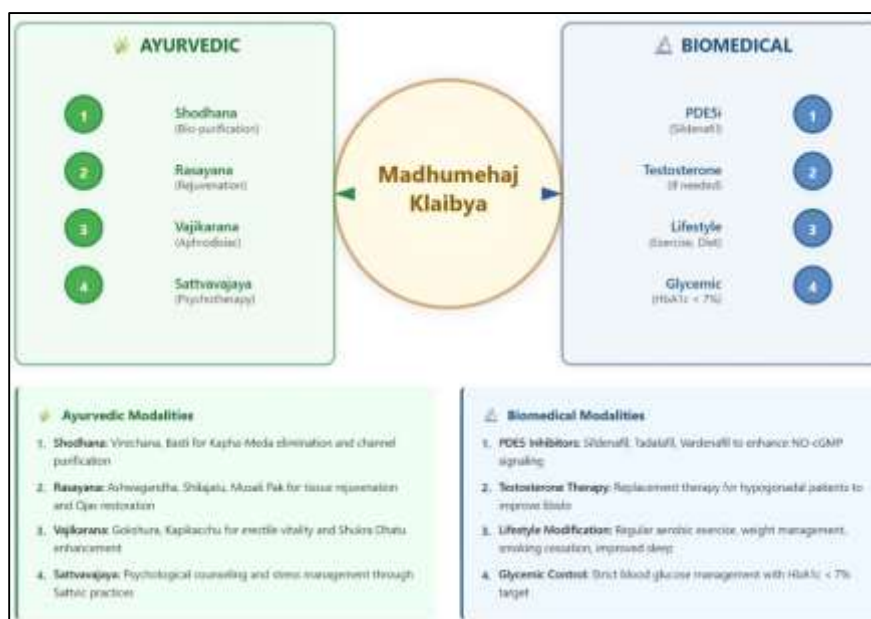
dysfunction and peripheral neuropathy. In individuals with hypogonadism, testosterone replacement therapy is recommended to improve libido and augment responsiveness to phosphodiesterase type 5 inhibitors [82], [83].

Mechanical and regenerative modalities are increasingly utilized in refractory cases. These include vacuum erection devices, intracavernosal injections of prostaglandin E1, and low intensity shockwave therapy, all of which have demonstrated clinical benefit in selected patient populations [84].

Non pharmacological strategies remain an essential component of care. Lifestyle modifications such as regular aerobic exercise, dietary optimization, smoking cessation, and weight reduction improve insulin sensitivity, enhance vascular function, and contribute to the restoration of sexual health [85], [86]. Mind body interventions including yoga and meditation have also been shown to increase parasympathetic activity and reduce psychological stress, thereby serving as valuable adjuncts to conventional biological therapies [87].

### 2.2.4 Integrative Perspective

The integration of contemporary pathophysiological insights with classical Ayurvedic principles provides a comprehensive framework for understanding *Madhumehaj Klaibya* as illustrated in Figure 2 [88]. Modern biomedical approaches primarily emphasize dysregulation of nitric oxide signaling, endothelial dysfunction, and metabolic control, whereas Ayurveda focuses on the restoration of *Agni*, nourishment of *Shukra dhatu*, and replenishment of *Ojas*. The convergence of evidence based biomedical therapies with *Rasayana* and *Vajikarana* interventions offers the potential to improve therapeutic outcomes, minimize long term pharmacological dependence, and promote overall physical and psychological wellbeing in men with diabetes associated erectile dysfunction [89].



**Figure 2:** Integrative approach in the cases of DMED.

### 3. Discussion

In Ayurveda, diabetes associated erectile dysfunction is termed *Madhumehaj Klaihya*, a disorder arising from *Kapha* and *Meda avarana* leading to *Vata* vitiation, *Agnimandya*, *Ojas kshaya*, and *Shukra dushti* [90]. In biomedical terms, this clinical phenotype corresponds to endothelial dysfunction, autonomic and somatic neuropathy, oxidative stress, reduced testosterone levels, and cavernosal fibrosis. Both explanatory models converge along a shared pathological continuum in which metabolic dysfunction leads to microvascular and neuronal impairment, culminating in compromised erectile function [91].

According to Ayurvedic principles, *Madhumeha* provokes *Vata* and obstructs the *Medovaha* and *Shukravaha srotas*, resulting in diminished strength and vitality of the *Upasthendriya*. This conceptual framework parallels modern evidence demonstrating reduced nitric oxide bioavailability, accumulation of advanced glycation end products, mitochondrial stress, and autonomic neuropathy in diabetes related erectile dysfunction [92]. Clinically, both paradigms recognize an earlier onset and increased severity of erectile dysfunction in men with poor glycemic control and multiple metabolic risk factors. Stringent glucose regulation aligns with *Agnideepana* and *Kapha Meda shamana*, thereby restoring physiological homeostasis [93].

A pragmatic integrative paradigm combines contemporary first line biomedical therapy with Ayurvedic *Rasayana* and *Vajikarana* interventions alongside structured lifestyle modification. From a biomedical perspective, management includes phosphodiesterase type five inhibitors to augment nitric oxide cyclic guanosine monophosphate signaling, evaluation and correction of hypogonadism, and advanced options for refractory cases such as intracavernosal prostaglandin E1, vacuum erection devices, and low intensity shockwave therapy [94].

Ayurvedic pharmacotherapy emphasizes *Rasayana* and *Vajikarana* agents including *Ashwagandha*, *Shilajatu*, *Gokshura*, *Kapikacchu*, and *Gudmar*, selected for their *Vata shamana*, antioxidant, insulin sensitizing, neuroprotective, and androgen supporting properties. These interventions may promote endothelial and neuronal repair while enhancing physical stamina, mood, and sexual vitality [95].

Lifestyle and psychosomatic interventions constitute an essential component of integrated care. Regular physical activity, weight reduction, optimization of sleep quality, smoking cessation, and the practice of yoga or meditation reduce sympathetic overactivity, improve endothelial function, and enhance insulin sensitivity [96]. These measures closely resemble the Ayurvedic concepts of *Dinacharya*, *Sattvavajaya*, and *Ahara vihara*. Addressing psychological stress,

performance anxiety, and depressive symptoms through counseling or *Sattvavajaya chikitsa* is particularly important, as these factors significantly exacerbate erectile dysfunction and impair treatment adherence [97].

For patients with suboptimal response to phosphodiesterase inhibitors, therapeutic strategies should prioritize improved glycemic control, assessment of androgen status, and adjunctive use of *Rasayana* and *Vajikarana* agents with demonstrated antioxidant and adaptogenic properties. Such an approach may enhance pharmacological responsiveness while reducing the need for dose escalation. Careful monitoring is essential when combining botanical therapies with antihyperglycemic and antihypertensive medications to avoid adverse interactions [98].

Although evidence supporting integrative management of diabetic erectile dysfunction is encouraging, it remains heterogeneous. Many Ayurvedic studies are limited by small sample sizes, non standardized formulations, and the absence of clearly defined clinical endpoints [99]. Future research should prioritize well designed multicenter randomized controlled trials using standardized botanicals with rigorous quality control, integrated diagnostic frameworks incorporating both Ayurvedic and biomedical parameters, and composite outcome measures including erectile function scores, glycemic indices, hormonal profiles, endothelial function, and patient reported outcomes [100].

Figure 3 Conceptual framework illustrating the Ayurvedic understanding of *Madhumeha* as a central metabolic disorder arising from the interplay of *Tridosha* imbalance involving *Kapha*, *Vata*, and *Pitta*. The model integrates contributory factors such as metabolic dysregulation, insulin deficiency, aging, genetic predisposition related to *Rasayana*, and lifestyle influences, and demonstrates their impact on metabolic equilibrium, *Ojas*, reproductive function, *Srotas*, vascular integrity, and mental health [101]. At the core, *Madhumeha* is characterized by *Kapha* predominance with secondary aggravation of *Vata* and *Pitta*, primarily due to *Kapha avarana*, leading to *Dhatu kshaya* with particular involvement of *Meda*, *Rasa*, and *Shukra dhatu*. These alterations manifest clinically as systemic complications including vascular dysfunction and neuropathy [102]. The lower intervention matrix depicts Ayurvedic and biomedical correlations, highlighting therapeutic strategies such as *Sattvavajaya*, *Vajikarana*, and *Panchakarma* for dosha balance alongside biomedical approaches including hormonal regulation, glycemic control, physical activity, sleep optimization, and long term metabolic and neurological management aimed at restoring endocrine function and preventing disease progression [103].



**Figure 3:** Holistic Framework for *Madhumehaj Klaibya*.

## Conclusion

Diabetes mellitus induced erectile dysfunction, described in Ayurveda as *Madhumehaj Klaibya*, represents a complex interplay of metabolic, vascular, neurological, and psychological factors. From an Ayurvedic perspective, this condition arises due to *Vata* and *Kapha* imbalance associated with *Meda* and *Shukra dhatu dushti*, culminating in *Ojas kshaya*. These concepts may be conceptually correlated with endothelial dysfunction, oxidative stress, and hypogonadism described in contemporary biomedical science. Ayurvedic management, encompassing *Agnideepana*, *Srotoshodhana*, *Rasayana*, and *Vajikarana chikitsa*, provides a holistic therapeutic framework that addresses both metabolic dysregulation and psychosexual impairment. Classical formulations such as *Ashwagandha Rasayana*, *Shilajatu*, *Musali Pak*, *Gudmar churna*, and *Gokshuradi Guggulu* are recognized for their adaptogenic, hypoglycemic, antioxidant, and androgen supporting properties. The integration of these interventions with modern therapeutic modalities including phosphodiesterase type five inhibitors, hormone replacement therapy, and structured lifestyle modification may enhance endothelial function,

improve treatment responsiveness, and reduce long term pharmacological dependence. Despite promising outcomes, further validation through well designed multicentric randomized controlled trials employing standardized formulations, objective biomarkers, and integrative diagnostic frameworks is essential to substantiate the role of Ayurvedic therapies within evidence-based management strategies for diabetic erectile dysfunction.

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## Author Contributions

**RRM**; Literature survey, **HS**; Critical analysis of literature, **SKB**; Manuscript drafting, **SKJ**; Conceptualization of the review, **SKT**; Supervision and final approval, **SC**; Interpretation of published studies, **PK**; Reference management.



**Conflict of Interest**

The authors declare that there is no conflict of interest related to this manuscript.

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**Ethical Statement**

As this article is a narrative review and conceptual analysis, it did not involve human participants or animal experimentation. Hence, approval from an

institutional ethics committee was not required.

**Use of Artificial Intelligence Tools**

The authors used AI-based language tools (ChatGPT and Grammarly Premium) only for language editing and clarity. All scientific content was created, reviewed, and approved by the authors.

**Data Availability Statement**

No new data were generated or analyzed in this study. All information is derived from previously published literature.

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