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BIOMEDICAL STUDY OF ERECTILE DYSFUNCTION WITH SPECIAL REFERENCE TO THE DISEASE KLAIBYA MENTIONED IN AYURVEDA

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ABSTRACT

Background: Erectile Dysfunction (ED) is a globally prevalent male sexual disorder, affecting over 150 million men worldwide with projections exceeding 322 million by 2025. Ayurveda describes a parallel condition, Klaibya, with remarkable clinical, aetiological, and prognostic precision in the Charaka Samhita, Sushruta Samhita, Bhavprakasha, and Ashtanga Hridayam.

Objective: To conduct a systematic conceptual-analytical study of Klaibya and correlate its typology, aetiology, pathogenesis, and prognosis with contemporary biomedical understanding of ED.

Methods: Classical references from Charaka Samhita (Chikitsa Sthana 30), Sushruta Samhita (Chikitsa Sthana 26), Bhavprakasha Uttarakhanda (72), and Ashtanga Hridayam were systematically reviewed. Modern biomedical literature was sourced from PubMed and Scopus using standard MeSH terms for erectile dysfunction.

Results: Seven distinct types of Klaibya were identified, correlating with vasculogenic, neurogenic, psychogenic, endocrinological, traumatic, age-related, and congenital ED. Aetiological factors overlap significantly with established biomedical risk factors including obesity, metabolic syndrome, psychological stress, and hormonal dysregulation.

Conclusion: The Ayurvedic conceptualisation of Klaibya demonstrates a sophisticated, multi-dimensional understanding of ED that offers integrative insights relevant to contemporary andrology and sexual medicine.

KEYWORDS: Klaibya, Erectile Dysfunction, Ayurveda, Dhwaja Upaghataj, Vajikarna, Shukra Dhatu, Sexual Medicine, Conceptual Study, Klaibya Nidana.

1. INTRODUCTION

Erectile Dysfunction (ED) is defined by the National Institutes of Health (NIH) Consensus Panel as the consistent or recurrent inability of a man to attain and/or maintain penile erection sufficient for sexual activity [1]. It ranks among the most prevalent chronic conditions in men globally. Worldwide projections estimate over 152 million men experienced ED in 1995, with figures projected to reach approximately 322 million by 2025 — nearly double — owing to the global ageing of populations and rising prevalence of metabolic comorbidities [2]. The Massachusetts Male aging Study (MMAS) documented that approximately 52% of men aged 40–70 years, experience some degree of ED, with complete ED affecting approximately 9.6% of this cohort [3].

Ayurvedic medicine has long recognised this condition under the nomenclature of Klaibya — a term encompassing impotence, sexual debility, and erectile failure. The classical texts conceptualise Klaibya across physiological, psychological, nutritional, genetic, and lifestyle dimensions, strikingly consonant with the modern biopsychosocial model of ED endorsed by the International Society of Sexual Medicine (ISSM) [5]. Despite this convergence, a rigorous analytical study correlating the Ayurvedic typology and patho-mechanism of Klaibya with modern biomedical evidence remains underrepresented in indexed literature. The present study bridges this evidence gap through systematic analysis of classical references and their biomedical correlates.

2. AIMS AND OBJECTIVES

- To systematically review the Ayurvedic conceptualisation of Klaibya (ED) from primary classical sources.
- To analyse and classify the typology, aetiology, pathogenesis, clinical features (Rupa), and prognosis of Klaibya.
- To correlate each type and aetiological category of Klaibya with contemporary biomedical categories and mechanisms of erectile dysfunction.
- To identify the integrative clinical relevance of Ayurvedic insights for modern andrology and sexual medicine.

3. MATERIALS AND METHODS

3.1 Study Design
This is a conceptual-analytical original research study based on systematic review of classical Ayurvedic literature. No clinical trial or human subject data was involved; ethical clearance was therefore not required.

3.2 Classical Sources Reviewed
- Charaka Samhita – Chikitsa Sthana, Adhyaya 30 (Vajikarana Chikitsa) [8]
- Sushruta Samhita – Chikitsa Sthana, Adhyaya 26 [9]
- Bhavprakasha – Uttarakhanda, Chapter 72 [10]
- Ashtanga Hridayam – Uttara Sthana (supplementary reference)
- Commentaries: Chakrapani Datta on Charaka; Dalhana on Sushruta

3.3 Modern Literature Search
PubMed and Scopus databases were searched (2000–2024) using MeSH terms: erectile dysfunction, vasculogenic ED, psychogenic ED, hypogonadism and ED, obesity and testosterone, penile rehabilitation, aromatase and testosterone, and male sexual dysfunction. English-language peer-reviewed articles were included. Case reports and non-peer-reviewed sources were excluded.

3.4 Analytical Framework
Classical descriptions were extracted verbatim with Sanskrit shlokas, transliterated, and translated. Biomedical correlations were established by pattern-matching aetiological, pathophysiological, and clinical parameters across both knowledge systems.

4.0 REVIEW OF LITERATURE
4.1 Definition and Diagnostic Criterion
Bhavprakasha defines Klaibya as: “Dhvajah syat surata shaktihi, tat abhavah Klaibya uchyate” (Bha.Pra.U.Kha. 72/2) — loss of power to perform sexual intercourse.
Charaka Samhita (C.Chi. 30/155-156) elaborates the cardinal diagnostic features: failure to achieve penile erection (Linga Shaithilya) even with a consenting partner; onset of breathlessness and sweating upon attempted intercourse; and failure of both erection and emission (Mogha Sankalpacheshita). This maps precisely to the NIH consensus definition [1], and to the IIEF (International Index of Erectile Function) assessment tool [11] which remains the gold standard diagnostic instrument.

4.2 Classification of Klaibya – Seven Types
Charaka (C.Chi. 30/154) identifies four primary types and Sushruta (S.Chi. 26/10-14) describes six types. Integration of both classifications yields the following seven comprehensive categories such as - 1. Bija Upaghataj2. Dhwaja Upaghataj3. Jaraya Klaibya4. Shukra Kshayaj5.Manas Klaibya6. Sahaj Klaibya, 7. Brahmacharya Nimittaj

4.3 Aetiology (Hetwani) and Biomedical Risk Factor Correlation
Charaka Samhita (C.Chi. 30/158-159) enumerates aetiological factors across five major domains:
Nutritional (Ahara) - Sheeta-Ruksha Ahara, Viruddha Anna, Ajirna Bhojanat, Anashanat, Rasadinam Sankshaya
Lifestyle (Vihara) - Ati Stri Sevanat, Shrama, Avistrambha
Psychological (Manasa) - Shoka, Bhaya, Chinta, Trasa
Iatrogenic (Chikitsa) - Panchakarma Apachara

4.4 Pathogenesis (Samprapti) and Biomedical Pathophysiology
4.4.1 Shukra Kshayaj – Nutritional Pathway
Charaka describes the pathogenic cascade as: Rasa Kashaya → Raktadi Dhatu Kshaya → Shukra Kshaya → Klaibya (C.Chi. 30/185-187). In modern terms, this represents: malnutrition → systemic hypoproteinaemia → impaired steroidogenesis → hypogonadotropic hypogonadism → ED. The concept of Rasa Dhatu as the primary nutritive plasma parallels the role of serum micronutrients and albumin in hormonal synthesis. Testosterone deficiency has been established as both a consequence and driver of metabolic syndrome, creating a bidirectional relationship with ED [6].

4.4.2 Dhwaja Upaghataj – Vascular-Traumatic Pathway
The clinical features — Shwayathu (oedema), Raga (erythema), Sphota (blistering), Kathin Valaya (induration), Tivra Daha (burning), Krimaya Jayante (infected ulcer) — span a continuum from simple penile cellulitis to Fournier’s gangrene (polymicrobial necrotising fasciitis). Viryawahi Sira Chhedat (injury to seminal ducts) corresponds precisely to iatrogenic injury to the vas deferens or cavernous arteries, a recognised cause of vasculogenic ED in modern urology [5,17].

4.4.3 Manas Klaibya – Psychogenic Pathway
Sushruta (S.Chi. 26/10) states that excessive psychological states (Bhaya, Shoka, Krodha, Dveshya Stri Prayogat) destroy the Rasa of the mind, leading to failure of sexual arousal. This aligns with the neuroscience of psychogenic ED, where central sympathetic arousal inhibits parasympathetic-mediated nitric oxide (NO) release required for cavernosal smooth muscle relaxation [4]. Dveshya Stri Prayogat (intercourse with an unwanted partner) anticipates partner-specific contextual

ED — a recognised psychosexual entity in modern sexual medicine [4]. Diagnostic assessment using validated tools such as the IIEF [11] captures the psychological domain of ED precisely.

4.4.4 Obesity, Aromatase, and Shukra Kshaya

A critical modern correlation is the adipose aromatase pathway: increased adiposity → elevated aromatase activity → androgen-to-oestradiol conversion → decreased free testosterone → impaired libido and erection [6]. Leptin excess and inhibin-B elevation further suppress spermatogenesis and insulin sensitivity. In Ayurvedic terms, excess Meda Dhatu (adipose tissue) causes Shukra Dhatu Dushti (qualitative semen/testosterone impairment). Lifestyle interventions targeting obesity have been demonstrated in an RCT to restore erectile function in approximately one third of obese men with ED at baseline [13].

4.4.5 Brahmacharya Nimittaj – Disuse Pathway

The description of impotence resulting from prolonged celibacy anticipates the modern concept of penile rehabilitation. Mulhall et al. demonstrated that erection absence after radical prostatectomy leads to penile smooth muscle fibrosis and hypoxia-driven collagen deposition [7,18], confirming that disuse of the erectile mechanism results in progressive structural deterioration. Early pharmacological or vacuum device-based penile rehabilitation is now standard urological practice [7].

4.5 Prognosis (Sadhya-Asadhyata) and Modern Prognostic Correlation

As per Ayurveda, Manas Klaibya (Mental erectile dysfunction) Shukra Kshayaj Klaibya (ED due to excessive loss of semen) are curable whereas Jaraya Klaibya (ED due senility), Sahaj Klaibya, Matruj-Pitruj Bijadoshaj (hereditary erectile dysfunction) are incurable.

5. OBSERVATIONS

Table No. 1- Classification of Klaibya

No.	Klaibya Type (Ayurvedic)	Classical Reference	Modern Biomedical Equivalent	Key Mechanism
1	Bija Upaghataj	C.Chi. 30/160	Genetic / Spermatogenic ED	Chromosomal anomalies; azoospermia
2	Dhwaja Upaghataj	C.Chi. 30/163-175; S.Chi. 26/10-12	Vasculogenic / Traumatic / Infective ED	Penile vascular injury, Peyronie's disease, Fournier's gangrene
3	Jaraya Klaibya	C.Chi. 30/176-180	Age-related / Senile ED	Testosterone decline; vascular aging; Leydig cell atrophy
4	Shukra Kshayaj	C.Chi. 30/181-187; S.Chi. 26/11	Nutritional / Seminal deficiency ED	Hypogonadism; malnutrition; hypospermia
5	Manas Klaibya	S.Chi. 26/10	Psychogenic ED	Sympathoadrenal inhibition of NO-mediated erection
6	Sahaj Klaibya	S.Chi. 26/13	Congenital / Hereditary ED	Klinefelter syndrome; androgen insensitivity; congenital azoospermia
7	Brahmacharya Nimittaj	S.Chi. 26/14	Disuse atrophy / Abstinence-related ED	Penile smooth muscle fibrosis from sexual inactivity

Table 1: Comparative Classification of Klaibya and Modern ED Categories

Table No. 2 – Aetiology of Klaibya (ED)

Ayurvedic Domain	Classical Factors	Modern Biomedical Correlate
Nutritional (Ahara)	Sheeta-Ruksha Ahara, Viruddha Anna, Ajirna Bhojanat, Anashanat	Malnutrition, zinc deficiency, low antioxidant diet, metabolic syndrome, obesity [13,14]
Psychological (Manasa)	Shoka, Bhaya, Chinta, Trasa	Depression, anxiety disorders, performance anxiety, sympathoadrenal hyperactivation [4]
Lifestyle (Vihara)	Ati Stri Sevanat, Shrama, Avistrambha	Relationship dysfunction, physical exhaustion, HPA axis dysregulation [14]
Iatrogenic (Chikitsa)	Panchakarma Apachara	Drug-induced ED: antihypertensives, antidepressants, antiandrogens [5]

Doshic / Systemic	**Rasadinam Sankshaya – dhatu depletion**	**Chronic systemic disease: DM, CVD, renal failure, hypothyroidism, hypogonadism [6]**

Table 2: Aetiological Correlation of Klaibya with Modern ED Risk Factors

Table No. 3 – Prognosis of Klaibya (ED)

Klaibya Type	Ayurvedic Prognosis	Modern Prognostic Outcome	Reference
Manas Klaibya	Sadhya (Curable)	Highly responsive to psychosexual therapy and PDE5 inhibitors	S.Chi. 26/15; [4,12]
Shukra Kshayaj	Sadhya (Curable)	Responsive to hormonal, nutritional, and Vajikarna therapy	C.Chi. 30/188; [6,13]
Jaraya Klaibya	Yapya (Manageable)	Partially managed with TRT and PDE5 inhibitors; not fully reversible	C.Chi. 30/180; [6]
Sahaj Klaibya	Asadhya (Incurable)	Requires penile prosthetics / ART; no pharmacological cure	S.Chi. 26/15; [5]
Dhwajabhangaj (Shefa Chheda)	Asadhya (Incurable)	Post-penectomy ED irreversible without phalloplasty	C.Chi. 30/190; [5]
Matruj-Pitruj Bijadoshaj	Asadhya (Incurable)	Congenital azoospermia / Y-chr microdeletion: no pharmacological cure	C.Chi. 30/189; [5,20]

Table 3: Prognostic Correlation of Klaibya with Modern ED Outcomes

5. DISCUSSION

The present study reveals that the Ayurvedic understanding of Klaibya constitutes a coherent, multi-dimensional nosological framework that anticipates nearly every major category of ED recognised in contemporary sexual medicine.

The seven-type integrated classification parallels the multifactorial model adopted in EAU guidelines [5], which categorise ED as vasculogenic, neurogenic, hormonal, anatomical, psychogenic, or mixed. The Ayurvedic insight that Bija Upaghataj (spermatic/genetic disorder) forms a distinct category anticipates modern genetic andrology, which identifies Y-chromosome microdeletions, Klinefelter syndrome (47XXY), and congenital bilateral absence of vas deferens (CBAVD) as incurable causes of male infertility and ED [20].

Particularly noteworthy is the Ayurvedic recognition of the obesity-testosterone axis. Excess Meda Dhatu causing Shukra Dhatu Dushti maps precisely to the aromatase-mediated androgen-to-oestrogen conversion in visceral adipose tissue, which is a primary endocrinological driver of ED in obese men [6]. An RCT by Esposito et al. (2004) demonstrated that lifestyle-based weight reduction restored erectile function in 31% of obese men with ED, with improved IIEF scores, providing strong translational validation [13].

The description of Brahmacharya Nimittaj Klaibya — impotence from prolonged celibacy — anticipates the concept of penile rehabilitation pioneered by Mulhall et al. [7,18]. Animal and human studies confirm that absence of erections causes corporal smooth muscle fibrosis, venous leak, and loss of erectile capacity, forming the mechanistic basis for post-prostatectomy penile rehabilitation protocols now endorsed by EAU [5,15].

The prognostic framework is equally significant. Sahaj Klaibya and Shefa Chheda are designated incurable, aligning with modern andrology where congenital azoospermia and post-penectomy states have no pharmacological solution and require penile prosthetics, phalloplasty, or ART [5,16]. The Yapya (manageable) designation for Jaraya Klaibya corresponds to age-related hypogonadism that can be managed but not reversed with testosterone replacement therapy (TRT).

The Mediterranean dietary pattern, analogous in principle to the Ayurvedic Sattvic Ahara (wholesome food), has been demonstrated in clinical studies to significantly improve IIEF scores in men with metabolic syndrome and ED [19], providing further translational convergence.

Limitations include the conceptual-analytical study design, which precludes direct clinical validation of Ayurvedic aetiological constructs. Future directions include RCTs of Vajikarna (Ayurvedic androgenic) formulations across specific ED subtypes, and prospective cohort studies correlating Prakriti-based constitution with ED risk profiles.

6. CONCLUSION

The Ayurvedic concept of Klaibya represents a sophisticated, clinically coherent, and multidimensional nosological framework for erectile dysfunction that demonstrates striking convergence with contemporary biomedical understanding. The seven-type classification, multi-domain aetiological matrix, pathomechanistic descriptions, and prognostic stratification of Klaibya offer actionable integrative insights for sexual medicine practitioners. Further translational and clinical research is warranted to validate specific Vajikarna interventions across the identified subtypes, and to explore constitution (Prakriti) based personalised risk stratification in male sexual health.

DECLARATIONS

Conflict of Interest - The authors declare no conflict of interest.
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Ethical issue – There is no ethical issue involved as it is scientific review

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