

A Narrative Review on *Raktapradara* (Menorrhagia): Classical Concepts, Contemporary Evidence, and the Therapeutic Potential of *Punarnava*

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Abstract

Background: *Raktapradara*, the Ayurvedic correlate of menorrhagia, is a common gynecological condition affecting reproductive-age women worldwide. **Objective:** This narrative review synthesizes classical Ayurvedic concepts with current scientific evidence on the burden, pathophysiology, and management of *Raktapradara*, with special emphasis on *Punarnava* (*Boerhavia diffusa*). **Methodology:** A systematic literature search was conducted in PubMed, Google Scholar, Scopus, and IndMed from inception to December 2024 using keywords including “*Raktapradara*,” “menorrhagia,” “*Boerhavia diffusa*,” “*Punarnava*,” and “*Asrigdara*.” Classical Ayurvedic texts were accessed through published translations and commentaries. Original research, systematic reviews, and preclinical studies on pharmacological mechanisms were included. **Results:** Epidemiological data show that menorrhagia affects approximately 30% of reproductive-age women and accounts for 20% of gynecology visits. The FIGO PALM-COEIN classification provides a structured etiological framework. Modern pharmacotherapy includes tranexamic acid (45-50% blood loss reduction), NSAIDs, and hormonal agents, but each has limitations. Several Ayurvedic formulations (Pushyanuga Churna, Darvyadi Kwatha, Gokshuradi Guggulu, etc.) have shown positive outcomes in preliminary clinical studies, though methodological quality is variable. *Punarnava* demonstrates classical indication for *Raktapradara*, with punarnavoside identified as an antifibrinolytic agent that reduces IUD-induced bleeding without affecting systemic coagulation. Anti-inflammatory and antioxidant actions further support its therapeutic potential. **Conclusion:** *Raktapradara* remains a significant health burden. While Ayurveda offers promising interventions, particularly *Punarnava*, the lack of rigorous randomized controlled trials is a major evidence gap. High-quality clinical studies are urgently needed to establish efficacy, safety, and optimal dosing.

1. Introduction

Menorrhagia is defined clinically as cyclic menstrual bleeding at normal intervals

where the blood loss exceeds 80 mL or the duration exceeds seven days (1). It affects

approximately 30% of women of reproductive age, and in about half of these cases, no organic pathology is identified (2). In India, the prevalence of abnormal uterine bleeding among adolescent girls is estimated at 19%, with menorrhagia being the most common complaint among those presenting to tertiary care centers (3,4). The condition leads to iron deficiency anemia, fatigue, reduced work productivity, and impaired quality of life (5).

Within the Ayurvedic framework, this condition is described as *Raktapradara* or *Asrigdara*. Acharya Charaka states, “*Rajah pradarśate yasmāt pradarastena sa smṛtaḥ*” the condition where excessive *raja* (menstrual blood) is discharged is termed Pradara (6). Acharya Sushruta further describes excessive flow even between menstrual periods as *Asrigdara* (7). The classical texts provide detailed etiological factors, pathogenesis, and treatment strategies that remain clinically relevant (8,9).

This narrative review aims to: (a) present the Ayurvedic understanding of *Raktapradara*; (b) summarize the contemporary epidemiological and pathophysiological concepts; (c) critically evaluate the existing evidence for Ayurvedic interventions; and (d) highlight

the therapeutic potential of *Punarnava* (*Boerhavia diffusa*) with a focus on its antifibrinolytic properties.

2. Objectives

This narrative review aims to synthesize classical Ayurvedic concepts with current scientific evidence on the burden, pathophysiology, and management of *Raktapradara*, with special emphasis on *Punarnava* (*Boerhavia diffusa*).

Specifically, the review:

- Presents the Ayurvedic understanding of *Raktapradara*
- Summarizes contemporary epidemiological and pathophysiological concepts
- Critically evaluates existing evidence for Ayurvedic interventions
- Highlights the therapeutic potential of *Punarnava* with focus on its antifibrinolytic properties

3. Methodology

This narrative review was conducted by searching electronic databases including PubMed, Google Scholar, Scopus, and IndMed (Indian Medical Journals) from inception to December 2024. The search

strategy combined keywords such as “*Raktapradara*,” “menorrhagia,” “*Boerhavia diffusa*,” “Punarnava,” “*Asrigdara*,” “Ayurveda,” and “abnormal uterine bleeding.” Additional search terms included “antifibrinolytic,” “punarnavoside,” and “heavy menstrual bleeding.” Only articles published in English or with English abstracts were included. Classical Ayurvedic texts in Sanskrit, Hindi, and Marathi were accessed through published translations and commentaries.

Included studies were original research (RCTs, cohort, case-control, case series), systematic reviews, and narrative reviews on *Raktapradara*/menorrhagia with Ayurvedic interventions or Punarnava; preclinical studies only for mechanisms. Excluded: postmenopausal, pregnancy-related, or malignant bleeding. Hand-searching of references was done. Data extraction focused on etiology, pathophysiology, treatment, and pharmacology. No meta-analysis due to heterogeneity. Quality was assessed (Jadad for RCTs, Newcastle-Ottawa for observational studies) but scores not reported.

4. Ayurvedic Framework of *Raktapradara*

4.1 Definition and Characteristics of Normal Menstruation

According to Acharya Charaka, normal *Artava* (menstrual blood) is discharged monthly for five days without burning sensation, abdominal pain, backache, or clots. Its color resembles that of *Gunja* (*Abrus precatorius*), *Kamala* (lotus), or *Indragopida* (a red insect) (6). Acharya Vagbhata adds that normal *Artava* has a color like rabbit’s blood or *Laksha rasa* (lac dye) and does not stain the cloth (10).

4.2 Etiology (*Nidana*) and Pathogenesis (*Samprapti*)

The causative factors for *Raktapradara* include excessive consumption of sour, salty, pungent, unctuous, and heavy foods, as well as *Vidahi* (burning-type) foods, preparations from flour paste, milk puddings, curd, and alcoholic drinks (11). These factors vitiate *Pitta* and *Vata doshas*, leading to *Rakta dhatu dushti* (vitiation of blood tissue). The aggravated *Vata* then expels the vitiated *Rakta* through the *Artavavaha Srotas* (menstrual channels) in excessive amounts (12). The condition is primarily considered a *Pitta-pradhana* disorder with secondary *Vata* involvement (13).

4.3 Treatment Principles

The management of *Raktapradara* involves both *Shodhana* (purification) and *Shamana* (pacification) therapies. *Shodhana* aims to expel vitiated *Doshas* through procedures such as *Virechana* (therapeutic purgation) (14). *Shamana* includes the use of drugs predominantly possessing *Kashaya* (astringent) and *Tikta* (bitter) tastes, along with *Pittashamaka* (Pitta-pacifying) and *Raktastambhaka* (hemostatic) actions (15). Dietary modifications include iron-rich foods, avoidance of spicy and sour items, and adequate rest (16).

5. Contemporary Understanding of Menorrhagia

5.1 Epidemiology and Burden

A systematic review and meta-analysis of 31 studies from India reported that almost one-fifth (19%) of Indian adolescent girls experience abnormal uterine bleeding (3). Among women of reproductive age, the prevalence of any menstrual disorder ranges from 3% to 87% across different studies (4). Menorrhagia accounts for 20% of gynecology outpatient visits and nearly 25% of gynecological operations (1). The direct and indirect costs include diagnostic

procedures, medications, hospitalizations, and lost workdays (17).

5.2 Etiological Classification: PALM-COEIN

The FIGO PALM-COEIN classification system categorizes abnormal uterine bleeding into structural (Polyp, Adenomyosis, Leiomyoma, Malignancy) and non-structural (Coagulopathy, Ovulatory dysfunction, Endometrial, Iatrogenic, not yet classified) causes (18). In women with menorrhagia and a normal pelvic examination, ovulatory dysfunction and coagulopathies (e.g., von Willebrand disease) are common underlying factors (19).

5.3 Modern Pharmacological Management

First-line medical treatments include:

- **Tranexamic acid:** an antifibrinolytic agent that reduces menstrual blood loss by approximately 45–50% (20). A randomized trial showed a reduction from 175 mL to 97 mL ($p < 0.0001$) (21).
- **Non-steroidal anti-inflammatory drugs (NSAIDs):** reduce prostaglandin levels and decrease blood loss by 20–50% (22).

- **Levonorgestrel-releasing intrauterine system:** reduces blood loss by 70–95% (23).
- **Combined oral contraceptives and oral progestins:** effective but associated with hormonal side effects (24).

Tranexamic acid is generally well tolerated, but it is contraindicated in women with a history of thromboembolism (25). These limitations underscore the need for safe and effective alternative therapies.

6. Evidence for Ayurvedic Interventions in *Raktapradara*

A substantial body of clinical research, primarily postgraduate dissertations, has evaluated various Ayurvedic formulations for *Raktapradara* (Table 1). Most studies report positive outcomes, but methodological limitations (small sample sizes, lack of blinding, short follow-up) are common (26).

Table 1: Selected Clinical Studies on Ayurvedic Interventions for *Raktapradara* / *Asrigdara*

Study (Year)	Intervention	Key Finding
Ghadge S. (2001)	Darvyadi Kwatha + Madhu	Significant relief in Pittaja <i>Raktapradara</i> (27)
Kharode M.S. (1998)	Shalmali Ghrita	Effective in reducing bleeding (28)
Kulkarni H.D. (2003)	Pushyanuga Churna	Beneficial for Rakta-Pradara (29)
Patil P.V. (2017)	Gokshuradi Guggulu	Significant symptom reduction in <i>Asrigdara</i> (30)
Pandya N.R. (2007)	Madhukadi Vati & Sarivadi Vati	Promising results (31)
Pandey R.S. (2017)	Mudgadya Ghrita	Positive outcomes in functional menorrhagia (32)

Hridhya R.S.	Saraseeja Makarandhadi Churna	Effective in menorrhagia (33)
Devi R. (2009)	Pradarhar Yoga	Effective in Rakta Pradara (34)

Several single herbs are also frequently cited (Table 2). Their primary actions are based on classical texts and preliminary modern studies.

Table 2: Key Single Herbs Used in *Raktapradara*

Latin name of Drug	Rasa	Proposed Mechanism
<i>Ashoka (Saraca asoca)</i>	<i>Kashaya, Tikta</i>	Uterotonic, haemostatic (6)
<i>Lodhra (Symplocos racemosa)</i>	<i>Kashaya, Tikta, Sheeta</i>	Astringent, Pitta-pacifying (7)
<i>Sariva (Hemidesmus indicus)</i>	<i>Madhura, Tikta, Kashaya</i>	Blood purifier, Raktapittahara (10)
<i>Dhataki (Woodfordia fruticosa)</i>	<i>Kashaya</i>	Astringent, useful in menorrhagia (35)
<i>Nagkeshar (Mesua ferrea)</i>	<i>Kashaya, Tikta</i>	Hemostatic, Kapha-Pitta pacifying (36)

7. Punarnava (*Boerhavia diffusa*): A Focused Review

7.1 Classical Ayurvedic Profile

In Raj Nighantu (Parpatadivarga), Punarnava is described as:

“रक्ता पुनर्नवा तिक्ता सारिणी शोफनाशिनी ।
रक्तप्रदरदोषघ्नी पाण्डुपित्तप्रमेहनुत् ॥” (35)

This indicates that the red variety (*Rakta Punarnava*) is bitter, anti-inflammatory,

alleviates *Raktapradara* and its associated dosha vitiation, and treats anemia, Pitta disorders, and diabetes.

The *Rasapanchaka* is as follows (37):

- **Rasa:** *Madhura* (sweet), *Tikta* (bitter), *Kashaya* (astringent)
- **Guna:** *Laghu* (light), *Ruksha* (dry)

- **Virya:** *Ushna* (hot)
- **Vipaka:** *Katu* (pungent)

The astringent taste provides a direct rationale for use in bleeding disorders by promoting vasoconstriction and reducing excessive secretions (38).

7.2 Phytochemistry

Boerhavia diffusa contains a wide range of bioactive compounds, including punarnavoside (a rotenoid glycoside), punarnavine (an alkaloid), lignans (e.g., liriodendrin), flavonoids (e.g., quercetin, kaempferol), and ecdysteroids (39). Punarnavoside has been identified as the primary compound responsible for antifibrinolytic activity (40).

7.3 Pharmacological Evidence for Menorrhagia

Antifibrinolytic activity: Punarnavoside demonstrated significant inhibition of fibrinolytic activity *in vitro* and *in vivo* in

animal models. In a clinical study on women with IUD-induced bleeding, punarnavoside reduced blood loss without affecting systemic coagulation parameters (prothrombin time, partial thromboplastin time) (40,41).

Anti-inflammatory and immunomodulatory effects: Punarnavine has shown dose dependent inhibition of pro-inflammatory cytokines (TNF- α , IL-6, IL-1 β) in experimental models (42). These actions may reduce endometrial inflammation, a contributing factor in some cases of menorrhagia.

Antioxidant activity: The flavonoids in *Boerhavia diffusa* scavenge free radicals and protect against oxidative stress, which could support endometrial health (43). Figure 1 summarizes the multi-targeted actions of Punarnava relevant to menorrhagia.

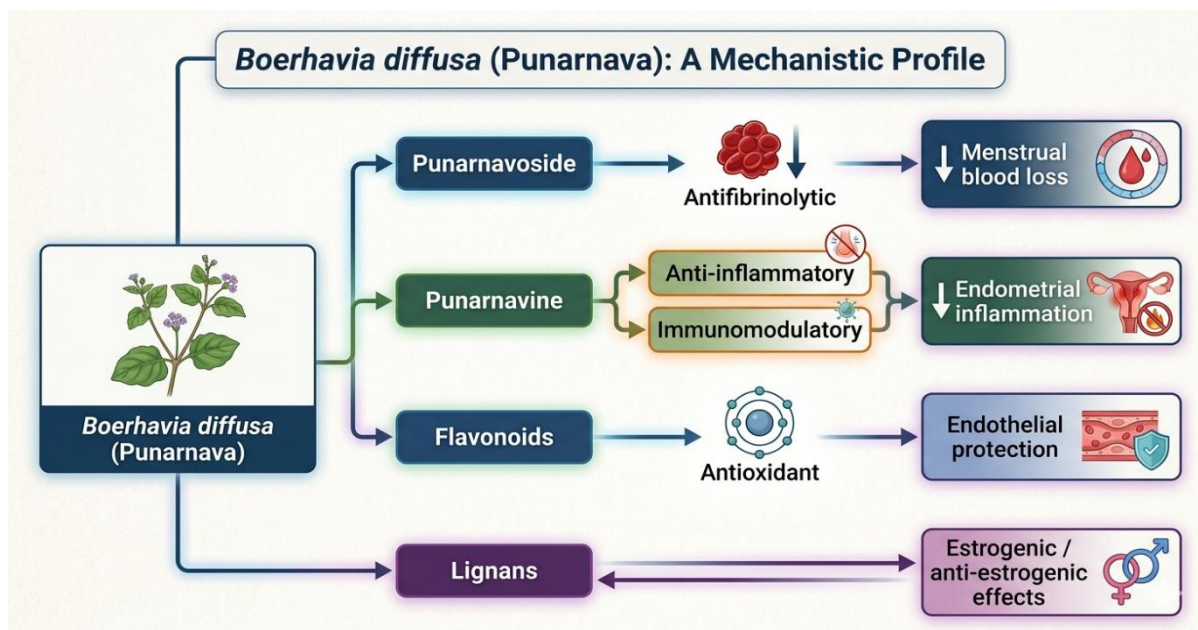


Figure 1: Multi-Targeted Pharmacological Actions of *Boerhavia diffusa* (Punarnava) in Menorrhagia

7.4 Clinical Evidence Gap

Despite the promising preclinical data, there is a striking lack of robust clinical trials on Punarnava specifically for menorrhagia. Most available evidence comes from traditional use and small, uncontrolled studies. A search of major databases (PubMed, Google Scholar, IndMed) up to 2024 identified only one clinical study on punarnavoside for IUD bleeding and no randomized controlled trials comparing Punarnava with placebo or active comparators for *Raktapradara* (44). This represents a critical evidence gap that needs to be addressed.

8. Discussion

This narrative review highlights a fundamental discordance between the rich classical heritage of Ayurveda for *Raktapradara* and the current level of scientific evidence. The Ayurvedic framework offers a coherent pathophysiological model and a wide range of therapeutic options. Several clinical studies on formulations such as Pushyanuga Churna, Darvyadi Kwatha, and Gokshuradi Guggulu have reported positive outcomes. However, these studies suffer from methodological limitations that preclude definitive conclusions (45).

The case of *Punarnava* is particularly instructive. The herb has a clear classical

indication, a plausible biological mechanism (antifibrinolysis via punarnavoside), and supportive preclinical data. Yet, no Phase II or Phase III randomized controlled trial has been published on its use for menorrhagia. This gap must be filled by well-designed studies that adhere to CONSORT guidelines, use standardized extracts, and include objective outcome measures (e.g., alkaline hematin method for blood loss, Pictorial Blood Loss Assessment Chart).

Another important consideration is the distinction between *Rakta Punarnava* (*Boerhavia diffusa*) and *Shveta Punarnava* (*Trianthema portulacastrum*). Classical texts recognize two varieties, and most pharmacological studies have focused on *Boerhavia diffusa*. Researchers must ensure proper botanical identification and authentication of plant material (37).

The integration of Ayurveda into mainstream gynecology requires not only clinical trials but also the standardization of formulations, quality control measures, and pharmacovigilance. The *Ayurvedic Pharmacopoeia of India* provides monographs for several herbs, but not yet for Punarnava Churna Vati as a finished product (46). Future research should also explore the potential synergistic effects of

Punarnava in combination with other *Raktastambhaka* herbs.

9. Conclusion

Raktapradara remains a common and debilitating condition with significant health and economic consequences. Ayurveda offers a time-tested framework and numerous therapeutic options that align with modern pathophysiological concepts. Among these, *Punarnava* (*Boerhavia diffusa*) stands out due to its classical indication, the identification of punarnavoside as an antifibrinolytic agent, and its multi-targeted pharmacological profile. However, the lack of rigorous clinical trials is a major barrier to clinical acceptance. High-quality randomized controlled trials are urgently needed to determine the efficacy, safety, and optimal dosing of Punarnava in women with menorrhagia. Until such evidence is available, clinicians should consider Punarnava as a promising but unproven intervention, best used within the context of well-monitored clinical research.

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