

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20253099>

## Original Research Article

# Levonorgestrel intrauterine system for heavy menstrual bleeding: a real-world experience from a tertiary centre in Northern India

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**Received:** 26 July 2025

**Revised:** 14 September 2025

**Accepted:** 16 September 2025

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## ABSTRACT

**Background:** Heavy menstrual bleeding (HMB) affects quality of life and health in reproductive-age women. Levonorgestrel intrauterine system (LNG-IUS) offers a conservative treatment option. This study aimed to evaluate the clinical efficacy and acceptability of LNG-IUS in women with HMB.

**Methods:** Retrospective analysis of 63 women (32-50 years) with HMB at Dr. RPGMC, Kangra, over two years. Follow-up was conducted at 1, 3, 6, and 12 months. Data included demographics, clinical presentation, hematological investigations, ultrasonographic findings, follow-up outcomes, and patient satisfaction scores.

**Results:** Mean age was 44.28 years; 50.79% were 45-50 years. Majority (68.25%) were para 2; 96.82% were married. Socioeconomic status varied, with 25.39% in the upper-lower class. The most common diagnosis was dysfunctional uterine bleeding (57.14%), followed by fibroid uterus (25.39%), adenomyosis (11.11%), and endometriosis (6.34%). Comorbidities included hypertension (15.87%) and diabetes (11.11%). Hemoglobin analysis showed moderate anemia in 52.38% and severe anemia in 26.98%. Bleeding patterns improved significantly: at 1 month, 57.14% had scanty flow; by 3 months, 74.60% reported reduced bleeding; at 6 months, 86.27% had scanty or no bleeding. By 12 months, 41.17% developed amenorrhea. Expulsion occurred in 2 cases; 2 others requested removal. Overall, 82.35% were satisfied with bleeding pattern; 98.03% had no dysmenorrhea. Social, sexual life, and mobility improved notably. Satisfaction assessment showed 80.38% of patients were either satisfied or very satisfied.

**Conclusions:** LNG-IUS is effective, safe, and well accepted for treating HMB, particularly in resource-limited settings. Its impact on reducing blood loss, correcting anemia, and improving life quality supports its wider use.

**Keywords:** Fetal distress, Hypertension in pregnancy, Stillbirths

## INTRODUCTION

Heavy menstrual bleeding (HMB) is a frequent gynecological issue, affecting 10-30% of reproductive-age women and contributing to one-third of outpatient visits.<sup>1</sup> Defined by blood loss  $\geq 80$  mL per cycle, HMB can lead to anemia, reduced quality of life, and psychosocial stress.<sup>2-4</sup> In India, where anemia affects over 50% of women due to nutritional deficiencies, heavy bleeding poses a public health challenge.<sup>5</sup>

HMB may result from structural or non-structural causes, per FIGO's PALM-COEIN classification.<sup>6</sup> Historically managed by hysterectomy, a shift toward conservative, fertility-preserving therapies has favored the LNG-IUS (7-9). This T-shaped device releases levonorgestrel locally (20 mcg/day) for 5 years, causing endometrial atrophy and minimal systemic effects. Despite earlier limitations due to cost and availability, Indian-made LNG-IUS products have improved access and acceptability. This study evaluates LNG-IUS outcomes in a real-world, tertiary-care

setting, focusing on clinical effectiveness and patient satisfaction in women with HMB.

## METHODS

This was a retrospective observational study conducted at the Department of Obstetrics and Gynecology, Dr. Rajendra Prasad Government Medical College, Tanda (Kangra), Himachal Pradesh, India. The study period spanned from June 2022 to June 2024. A total of 63 women aged 32-50 years presenting with heavy menstrual bleeding (HMB) were included. Diagnosis was confirmed clinically and supported by ultrasonography.

### Inclusion criteria

Women with HMB of benign etiology who consented for LNG-IUS insertion were included.

### Exclusion criteria

Women with uterine anomalies, submucosal fibroids, pelvic malignancies, pelvic inflammatory disease, coagulation disorders, or suspected pregnancy were excluded.

Following counseling and informed consent, all women underwent dilatation and curettage (D&C) under sedation to exclude premalignant or malignant pathology before LNG-IUS insertion. The LNG-IUS was placed under aseptic conditions in the proliferative phase of the menstrual cycle. Patients were instructed to maintain menstrual diaries. Follow-up visits were scheduled at 1, 3, 6, and 12 months after insertion. Clinical outcomes assessed included bleeding pattern, hemoglobin improvement, presence of dysmenorrhea, and adverse events (expulsion or device removal). Patient satisfaction was recorded using a 5-point Likert scale and quality-of-life domains (social, sexual life, and mobility) were documented. The study was retrospective in design, with anonymized data analysis. Formal ethical approval was waived by the Institutional Ethics Committee of Dr. RPGMC, Kangra.

### Statistical analysis

Data were compiled in Microsoft Excel and analyzed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean±standard deviation (SD), while categorical variables were presented as frequencies and percentages.

## RESULTS

This retrospective analysis included 63 women aged 32-50 years presenting with heavy menstrual bleeding (HMB) and treated with the levonorgestrel-releasing intrauterine system (LNG-IUS) between June 2022 and June 2024 at Dr. Rajendra Prasad Government Medical College, Tanda (Kangra), Himachal Pradesh.

**Table 1: Demographic profile.**

Demographic characteristics		No. of patients	Percentage
Age (years)	32-40	11	17.46
	40-45	20	31.74
	45-50	32	50.79
Marital status	Married	61	96.82
	Unmarried	2	3.17
Socio-economic status	Upper class	10	15.87
	Upper middle	14	22.22
	Lower middle	11	17.46
	Upper lower	16	25.39
	Lower	12	19.04

Demographic and clinical characteristics (table 1) showed that majority of women (50.79%) were in the 45-50 years age group, with the mean age being 44.28 years. Most participants (96.82%) were married, and the socio-economic distribution indicated a predominance of upper-lower (25.39%) and lower-class women (19.04%), reflecting the reach of this modality among economically weaker sections. In terms of parity, the majority (68.25%) were Para 2, followed by Para 3 (14.28%). Presenting complaints were menorrhagia (46.03%), polymenorrhagia (19.04%), and menorrhagia associated with dysmenorrhea (31.74%). Uterine size ranged from normal multiparous (65.07%) to 10-12 weeks in a small proportion (4.76%), suggesting moderate uterine enlargement in some cases (Table 2).

**Table 2: Clinical features at presentation.**

Clinical features		No. of patients	Percentage
Symptoms	Menorrhagia	29	46.03
	Polymenorrhagia	12	19.04
	Menorrhagia with dysmenorrhea	20	31.74
	Dysmenorrhea	2	3.17
Signs	Normal multiparous uterus	41	65.07
	Uterine size 6-8 weeks	11	17.46
	Uterine size 8-10 weeks	8	12.69
	Uterine size 10-12 weeks	3	
	Adnexal mass present	5	4.76

### Comorbidities and investigations

A significant proportion of patients (73.01%) had no comorbidities; however, 15.87% had hypertension, and 11.11% had diabetes, which can influence menstrual patterns. Hemoglobin analysis showed moderate anemia (7-9.9 gm%) in 52.38% and severe anemia (<7 gm%) in

26.98%, highlighting the burden of chronic blood loss and its impact on overall health.

Pelvic ultrasonography revealed a normal uterus in 57.14% of cases, leiomyoma in 25.39%, adenomyosis in 11.11%, and endometriotic cysts in 6.34%. These findings correlated with the etiologic diagnoses: dysfunctional uterine bleeding (57.14%), fibroid uterus (25.39%), adenomyosis (11.11%), and endometriosis (6.34%) (Table 3).

### Etiologies of HMB

Dysfunctional uterine bleeding (DUB) was the most common underlying cause of heavy menstrual bleeding (57.14%), followed by fibroid uterus with a normal uterine cavity (25.39%). Adenomyosis and endometriosis were responsible in 11.11% and 6.34% of cases, respectively. A small proportion (1.58%) presented with both fibroids and endometriosis, highlighting the overlap of etiologies in chronic cases of HMB (Table 4).

### Treatment outcome and bleeding patterns

Follow-up data over 1 year showed a progressive and substantial improvement in bleeding patterns (Table 5). After 6 months, 67.85% (38/56) reported scanty flow, and 16.07% (9/56) achieved amenorrhea. At 12 months and later, 41.17% (21/51) had amenorrhea, and only 3.92% (2/51) reported ongoing normal flow. Notably, no patients reported no relief at 12 months, indicating universal improvement among those retained in follow-up.

**Table 3: Investigations.**

Investigations		No. of patients	Percentage
Hemoglobin	Normal (>11 gm %)	4	6.34
	Mild (10-10.9 gm %)	9	14.28
	Moderate (7-9.9 gm %)	33	52.38
	Severe (<7 gm %)	17	26.98
Ultrasound	Normal	36	57.14
	Leiomyoma	16	25.39
	Adenomyosis	7	11.11
	Endometriotic cysts	4	6.34

**Table 4: Etiology of heavy menstrual bleeding.**

Diagnosis	No. of patients	Percentage
Dysfunctional uterine bleeding	36	57.14
Fibroid uterus with normal cavity	16	25.39
Endometriosis	4	6.34
Adenomyosis	7	11.11
Fibroid uterus with endometriosis	1	1.58

**Table 5: Follow-up of LNG-IUS.**

Bleeding patterns	1 months (n=63)	3 months (n=63)	6 months (n=56)	12 months & later (n=51)
No relief	5	4	1	-
Moderate flow	16	9	-	-
Normal flow	6	3	8	2
Scanty flow	36	47	38	28
Irregular spotting	-	26	22	9
Amenorrhea	-	-	9	21
Expulsion	-	2	2	2
Device removed	-	1	2	2
Dysmenorrhea	16	9	1	-

A small number of expulsions were documented (n=2; 3.17%), and 2 patients (3.17%) had their LNG-IUS removed due to dissatisfaction or complications. Spontaneous expulsions occurred within 3 months in all cases, consistent with known expulsion windows.

Dysmenorrhea, reported in 34.92% at baseline, showed a remarkable reduction over time. Only 1 patient reported mild dysmenorrhea at 6 months, and none reported pain by 12 months, highlighting the anti-inflammatory and endometrial suppressive effects of LNG-IUS.

### Patient perception and satisfaction

Among the 51 women who completed long-term follow-up, 82.35% were satisfied with their altered bleeding pattern. A vast majority reported no or tolerable spotting (82.35% no spotting; 5.88% negligible). Relief from dysmenorrhea was nearly universal. Quality of life measures, including social life (88.23%), sexual life (78.43%), and mobility (100%), improved significantly (Table 6).

**Table 6: Women perception with LNG-IUS.**

Women perception with LNG-IUS		No. of patients (n=51)	Percentage
<b>Bleeding pattern</b>	Ok	42	82.35
	Not ok	6	11.76
	Can't say	3	5.88
<b>Vaginal spotting</b>	Yes	9	17.64
	No	42	82.35
	Yes, but doesn't bother much	3	5.88
<b>Dysmenorrhea</b>	Yes	0	0
	No	50	98.03
	Mild	1	1.96
<b>Social life</b>	Ok	45	88.23
	Not ok	4	7.84
	Can't say	2	3.92
<b>Sexual life</b>	Ok	41	78.43
	Not ok	8	15.68
	Can't say	2	3.92
<b>Mobility</b>	I am mobile	51	100
	My mobility is restricted	-	0
	I am confined to bed	-	0

Satisfaction scores on the Likert scale indicated that 41.2% of participants were very satisfied, 39.2% were satisfied, and 19.6% reported being neutral. Only 7.84% were dissatisfied, and 3.92% very dissatisfied, corresponding with device expulsion or removal.

## DISCUSSION

Heavy menstrual bleeding (HMB) significantly impacts women's health and quality of life, and our study findings reinforce earlier Indian reports demonstrating the efficacy of LNG-IUS in reducing menstrual blood loss and improving patient satisfaction.<sup>1</sup> Warner et al emphasized that the burden of HMB is often underestimated and that clinical features alone are insufficient to predict menstrual blood loss.<sup>2</sup> Classic studies have shown wide inter-individual variation in menstrual blood loss, highlighting the need for objective treatment strategies.<sup>3</sup> Janssen et al later argued for reconsideration of traditional definitions of menorrhagia, advocating for individualized approaches.<sup>4</sup>

Hurskainen et al compared LNG-IUS with hysterectomy and found comparable long-term outcomes at reduced cost, making LNG-IUS an attractive conservative option.<sup>5</sup> The PALM-COEIN system standardized classification of abnormal uterine bleeding, allowing better diagnosis and management pathways.<sup>6</sup> Randomized controlled trials confirmed that LNG-IUS reduces menstrual blood loss more effectively than oral progestins, while systematic

reviews demonstrated its superiority compared to endometrial ablation.<sup>7,8</sup>

Clinical trials in perimenopausal women showed LNG-IUS to be effective and acceptable, and studies on fibroid-related menorrhagia confirmed its role as a non-surgical option.<sup>9-11</sup> Beyond fibroids, Sheng et al demonstrated its long-term effectiveness in adenomyosis, while Lockhat et al reported similar benefits in endometriosis.<sup>12,13</sup> Evidence from Pakistan also supports LNG-IUS as a dual option for both abnormal uterine bleeding and contraception.<sup>14</sup>

Apart from therapeutic effects, LNG-IUS offers important contraceptive and non-contraceptive benefits.<sup>15</sup> Quality-of-life studies have shown improvements in physical and social well-being after LNG-IUS insertion, with multicentre data also supporting its role in idiopathic menorrhagia.<sup>16,17</sup> More recently, meta-analyses have confirmed that LNG-IUS provides greater reduction in blood loss compared to medical therapy.<sup>18</sup> Indian midlife health studies, such as Desai's, have highlighted its value in managing benign perimenopausal bleeding disorders.<sup>19</sup>

In our cohort, the device achieved substantial reduction in bleeding and dysmenorrhea, with high satisfaction rates and minimal adverse events, consistent with global data. Expulsion and removal rates were low, comparable to those in international literature. Additionally, improvements in quality-of-life parameters such as mobility, sexual health, and social life paralleled outcomes reported elsewhere.

Thus, the present findings add to the existing evidence base by demonstrating that LNG-IUS is a safe, effective, and acceptable alternative to surgical interventions for Indian women with HMB, especially in resource-limited settings.

## CONCLUSION

LNG-IUS is a safe, effective, and highly acceptable conservative option for managing HMB in Indian women. With high continuation, low complication, and improved quality-of-life indicators, it presents a viable alternative to surgical interventions.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee of Dr. RPGMC, Kangra, Himachal Pradesh, India*

## REFERENCES

1. Kaur H, Sikka P, Kaur T. Efficacy of LNG-IUS in heavy menstrual bleeding: a cohort study. *Int J Reprod Contracept Obstet Gynecol.* 2021;10(2):456-60.
2. Warner PE, Critchley HO, Lumsden MA, Campbell-Brown M, Douglas A, Murray GD. Menorrhagia I: measured blood loss, clinical features, and outcome in

- women with heavy periods. *Am J Obstet Gynecol.* 2004;190(5):1216-23.
3. Cole SK, Billewicz WZ, Thomson AM. Sources of variation in menstrual blood loss. *J Obstet Gynaecol Br Commonw.* 1971;78:933-9.
  4. Janssen CA, Scholten PC, Heintz AP. Reconsidering menorrhagia in gynecological practice. *Eur J Obstet Gynecol Reprod Biol.* 1998;78:69-72.
  5. Hurskainen R, Teperi J, Rissanen P, Aalto AM, Grenman S, Kivelä A, et al. Clinical outcomes and costs with LNG-IUS or hysterectomy for menorrhagia: RCT 5-year follow-up. *JAMA.* 2004;291(12):1456-63.
  6. Munro MG, Critchley HO, Broder MS, Fraser IS. FIGO classification (PALM-COEIN) for AUB. *Int J Gynaecol Obstet.* 2011;113(1):3-13.
  7. Kaunitz AM, Bissonnette F, Monteiro I. LNG-IUS vs medroxyprogesterone for HMB: RCT. *Practice Bulletin No. 115: Vaginal Birth After Previous Cesarean Delivery.* *Obstet Gynecol.* 2010;116(3):625-32.
  8. Kaunitz AM, Meredith S, Inki P, Kubba A, Sanchez-Ramos L. LNG-IUS vs endometrial ablation in HMB: systematic review & meta-analysis. *Obstet Gynecol.* 2009;113(5):1104-16.
  9. Kucuk T, Ertan K. Medroxyprogesterone acetate vs LNG-IUS in perimenopausal menorrhagia: RCT. *Clin Exp Obstet Gynecol.* 2008;35:57-60.
  10. Senol T, Kahramanoglu I, Dogan Y, Baktiroglu M, Karateke A, Suer N. Levonorgestrel-releasing intrauterine device use as an alternative to surgical therapy for uterine leiomyoma. *Clin Exp Obstet Gynecol.* 2015;42(2):224-7.
  11. Awasthi D, Kulshrestha V, Agarwal N. Efficacy of LNG-IUS in uterine leiomyoma. *Int J Gynaecol Obstet.* 2012;116(1):35-8.
  12. Sheng J, Zhang WY, Zhang JP, Lu D. LNG-IUS study on adenomyosis: 3-year follow-up. *Contraception.* 2009;79(3):189-93.
  13. ockhat FB, Emembolu JO, Konje JC. Effectiveness of LNG-IUS in endometriosis. *Hum Reprod.* 2005;20(3):789-93.
  14. Tariq N, Ayub R, Jaffery T, Khan AT. Efficacy of LNG-IUS for AUB & contraception. *J Coll Physicians Surg Pak.* 2011;21(4):210-3.
  15. Paula HB, Jeffrey TJ. LNG-IUS use: contraceptive & non-contraceptive benefits. *Int J Womens Health.* 2009;1:45-58.
  16. Gorgen H, Api M, Akça A, Cetin A. Use of the Levonorgestrel-IUS in the treatment of menorrhagia: assessment of quality of life in Turkish users. *Arch Gynecol Obstetr.* 2009;279(6):835-40.
  17. Lete I, Obispo C, Izaguirre F, Orte T, Rivero B, Cornellana MJ, Bermejo I, et al. The levonorgestrel intrauterine system (Mirena®) for treatment of idiopathic menorrhagia. Assessment of quality of life and satisfaction. *The Europ J Contracep Reproduct Health Care.* 2008;13(3):231-7.
  18. Chen X, Liu Y, Peng Z. LNG-IUS vs medical therapies for HMB: systematic review & meta-analysis. *Eur J Obstet Gynecol Reprod Biol.* 2022;273:112-8.
  19. Desai RM. LNG-IUS for menorrhagia due to benign uterine lesions in perimenopausal women. *J Midlife Health.* 2012;3(1):20-3.

**Cite this article as:** Thakur M, Gupta A, Verma M. Levonorgestrel intrauterine system for heavy menstrual bleeding: a real-world experience from a tertiary centre in Northern India. *Int J Reprod Contracept Obstet Gynecol* 2025;14:3502-6.