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Original Research Article

Efficacy and Safety of Levonorgestrel IUCD in the Management of Abnormal Uterine Bleeding and its Varied Etiologies

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Abstract:

Background: Abnormal uterine bleeding (AUB) is one of the most common gynecological complaints in Indian women, particularly in the reproductive and perimenopausal age groups. The levonorgestrel-releasing intrauterine contraceptive device (LNG-IUCD) presents itself as a promising therapeutic alternative for AUB. Therefore, the study was aimed to evaluate the efficacy, safety, and acceptability of LNG-IUD in women with AUB over 6 months at tertiary care hospital.

Material and Methods: The present prospective observational study was undertaken in Department of Obstetrics and Gynecology at Sri Siddhartha Medical College and Hospital, Tumakuru & District Hospital, Tumakuru during the period from August 2025 to January 2026. A total sample size of 100 patients with heavy menstrual bleeding not on any medication was included in the study population. The study was conducted after taking ethical clearance from the institute and informed consent from the patients. Patients were instructed to utilise the Pictorial Blood Loss Assessment Chart (PBAC).

Results: The majority of participants were aged 20–39 years (93%) and were multiparous (85%). Most participants had no co-morbidities (68%); however, hypertension and obesity were each present in 18%. , IUCD remained in place in 77% of patients. Spontaneous expulsion occurred in 7%, 6% required removal, and 10% were lost to follow-up. A significant reduction in mean PBAC score following LNG-IUCD insertion was observed.

Conclusion: The present study concludes that the Levonorgestrel Intrauterine Contraceptive Device is a highly effective and safe non-surgical option for managing heavy menstrual bleeding.

Keywords: Levonorgestrel IUCD, Abnormal uterine bleeding (AUB), Dysfunctional uterine bleeding (DUB), Efficacy, Safety.

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Introduction

Abnormal uterine bleeding (AUB), is one of the most common gynecological complaints in Indian women, particularly in the reproductive and perimenopausal age groups.[1] It significantly impacts quality of life, contributes to anemia, and increases healthcare burden due to frequent outpatient visits, investigations, and surgical interventions such as hysterectomy. [2]

The treatment modalities for heavy menstrual bleeding (HMB) include pharmacological intervention, conservative surgical procedures (endometrial ablation), and final surgical intervention (hysterectomy). [3]

In India, many women suffer from limited access to advanced diagnostic tools and surgical facilities, especially in rural and semi-urban areas. In such settings, cost-effective, non-invasive, long-acting solutions are essential. [4,5]

The levonorgestrel-releasing intrauterine device (LNG-IUS), launched as a contraceptive in Finland in 1990, has proven effective in treating severe irregular uterine bleeding in industrialised nations. LNG-IUS has demonstrated superior efficacy compared to conventional medical therapy in women suffering from severe monthly bleeding, therefore enhancing quality of life. [6] LNG-IUS is a long-acting, non- surgical alternative to traditional medication and surgical treatments for menorrhagia. [7]

The levonorgestrel-releasing intrauterine contraceptive device (LNG-IUCD) presents itself as a promising therapeutic alternative for AUB due to

the following reasons with high efficacy in reducing menstrual blood loss, safety profile, fertility-sparing, cost-effective long-term therapy and versatile uses. [8]

Therefore, the study was aimed to evaluate the efficacy, safety, and acceptability of LNG-IUD in women with AUB over 6 months at tertiary care hospital.

Objective:

- To study the efficacy, safety, and acceptability of LNG-IUD in women with Abnormal uterine bleeding at tertiary care hospital

Material and Methods

The present prospective observational study was conducted in Department of Obstetrics and Gynaecology at Sri Siddhartha Medical College and Hospital, Tumakuru & District Hospital, Tumakuru during the period from August 2025 to January 2026. A total sample size of 100 patients with heavy menstrual bleeding not on any medication and willing to participate in the study were included in the study. Patients with fibroid more than 12 weeks, patients on any other hormonal therapy, sexually Transmitted Infections at the time of insertion including cervicitis, vaginitis, or any other lower genital infection, malignancies of lower genital tract, pregnancy and related complications and patients who are not willing to participate in the study were excluded.

All patients who satisfied the inclusion criteria were enrolled in the trial. A pre- designed, pre-tested, semi-structured, and pre-coded proforma was utilised to document all findings. The questions were semi-closed-ended. The study was done following the acquisition of ethical clearance from the Institutional Ethical Committee.

Patients presenting to the gynaecology outpatient department at Government Maternity Hospital, Tumkur, with primary symptoms of menorrhagia were assessed using fundamental laboratory investigations, abdominal and pelvic ultrasonography, Pap screening, hysteroscopy, and endometrial biopsy. Levonorgestrel IUCD was implanted in the participants of the trial group.

Patients were instructed to utilise the Pictorial Blood Loss Assessment Chart (PBAC), [9] which assigns ratings based on the staining of menstrual cups and cotton- based sanitary pads used during the menstrual cycle, to evaluate their menstrual blood volume and to input the data for three months. The data was inputted in Microsoft Excel 2016. Data were analysed with Microsoft Excel 2016 and Epi Info 7.2.0. P value less than 0.05 was taken as statistically significant.

Results

Table 1: Distribution according to socio-demographic profile of patient

Variables		No. of Patients (n=100)	Percentage
Age group (years)	20-29	46	46.00
	30-39	47	47.00
	40-49	07	07.00
Education	Illiterate	34	34.00
	Primary school	17	17.00
	Secondary school	24	24.00
	Intermediate	21	21.00
	Graduation & above	04	04.00
Socio-economic class	Class I (Upper)	06	06.00
	Class II (Upper middle)	15	15.00
	Class III (Lower middle)	38	38.00
	Class IV (Upper lower)	35	35.00
	Class V (Lower)	06	06.00
Duration of married life	1-5 years	20	20.00
	6-10 years	69	69.00
	>10 years	11	11.00

Table 1 shows that the majority of participants were aged 20–39 years (93%). A considerable proportion were illiterate (34%). Most belonged to lower middle (38%) and upper lower (35%) socio-economic classes. The majority (69%) had a marital duration of 6–10 years.

Table 2: Distribution according to clinical profile of patient

Variables		No. of Patients (n=100)	Percentage
Parity	Nulliparous	15	15.00
	Multiparous (1 to 4)	85	85.00
Co-morbidities	Hypertension	18	18.00
	Obesity	18	18.00
	Diabetes Mellitus	08	08.00
	Thyroid abnormalities	06	06.00
	None	68	68.00
Symptoms	Menorrhagia	52	52.00
	Menometrorrhagia	16	16.00
	Menorrhagia with Dysmenorrhea	32	32.00

Table 2 shows that the majority of patients were multiparous (85%). Most participants had no co-morbidities (68%); however, hypertension and obesity were each present in 18% of patients, followed by diabetes mellitus (8%) and thyroid abnormalities (6%). Menorrhagia was the most common presenting symptom (52%), followed by menorrhagia with dysmenorrhea (32%) and menometrorrhagia (16%).

Table 3: Distribution according to investigation findings of patient:

Variables		No. of Patients (n=100)	Percentage
USG findings	Normal	52	52.00
	Fibroid	16	16.00
	Adenomyosis	11	11.00
	PCOD	06	06.00
	Thickened Endometrium	15	15.00
Hysteroscopy Findings	Normal study	62	62.00
	Endometrial Hyperplasia	14	14.00
	Fibroid	16	16.00
	Polyp	08	08.00
Histopathology findings	Normal	12	12.00
	Proliferative endometrium	67	67.00
	Secretory endometrium	09	09.00
	Simple hyperplasia without atypia	14	14.00

Table 3 shows that on ultrasonography, 52% of patients had normal findings, while fibroid (16%) and thickened endometrium (15%) were the most common abnormalities. On hysteroscopy, the majority had normal findings (62%), followed by fibroid (16%), endometrial hyperplasia (14%), and polyp (8%). Histopathological examination revealed proliferative endometrium as the most common finding (67%), followed by simple hyperplasia without atypia (14%), secretory endometrium (9%), and normal endometrium (12%).

Table 4: Distribution according patients' status during follow up period after LNG-IUD

Variables		No. of Patients (n=100)	Percentage
Complaints	Spotting	32	32.00
	White discharge per vagainum	18	18.00
	Back ache	15	15.00
Outcome	IUCD in place	77	77.00
	Lost to follow up	10	10.00
	Spontaneous Expulsion	07	07.00
	Removal of IUCD	06	06.00

Table 4 shows that during the follow-up period after LNG-IUD insertion, the most common complaint was spotting (32%), followed by white discharge per vaginum (18%) and backache (15%). Regarding outcomes, IUCD remained in place in 77% of patients. Spontaneous expulsion occurred in 7%, 6% required removal, and 10% were lost to follow-up.

Table 5: Distribution according alternate treatment option for LNG IUCD Failure patients

Alternate treatment	No. of Patients (n=13)	Percentage
Hysterectomy	10	76.92
Hormonal Therapy	03	23.08

Table 5 shows that among 13 patients with LNG-IUCD failure, the majority underwent hysterectomy (76.92%), while 23.08% were managed with hormonal therapy.

Table 6: Comparison of mean PBAC before and after LNG IUCD insertion

Timing	PBAC (Mean ± SD)	P value
Before insertion of LNG IUCD	265.68 ± 120.67	<0.0001 *
After 3 months of insertion of LNG IUCD	89.78 ± 59.42	

(* Statistically significant by Paired T test)

Table 6 shows a significant reduction in mean PBAC score following LNG-IUCD insertion. The mean PBAC decreased from 265.68 ± 120.67 before insertion to 89.78 ± 59.42 at 3 months after insertion, which was statistically highly significant ($p < 0.0001$).

Discussion

Sexual and reproductive health are fundamental human rights that greatly enhance women's empowerment and the achievement of gender equality; ensuring widespread access to these services is essential for realising this goal.

The present prospective observational research was done at the Department of Obstetrics and Gynaecology, Tumkur, with objective to evaluate the efficacy of the Levonorgestrel Intrauterine Contraceptive Device in women experiencing heavy menstrual bleeding.

In the present study, most participants were aged 20–39 years (93%) indicating that abnormal uterine bleeding was more common in the reproductive age group. Comparable findings were reported by Nidhi et al. [10] (2022) and Bafna BA et al. [11] (2021), who observed mean ages of 44.73 and 39.53 years, respectively. Sinharoy SS et al. [12] (2023) reported a mean age of 31.5 years, which closely aligns with the present study. Wilson L et al. [13] (2025) also noted higher prevalence in women aged 39–47 years. Differences across studies may be due to variations in population and study settings.

In the present study, most participants belonged to the lower middle (38%) and upper lower (35%) socioeconomic classes. Similar observations were reported by Nidhi et al. [10] (2022), where a majority had moderate socioeconomic status. Sinharoy SS et al. [12] (2023) also noted higher prevalence of heavy menstrual bleeding in low- and middle-income settings. These findings indicate that abnormal uterine bleeding is more common among women from middle and lower socioeconomic groups.

The study showed hypertension and obesity were most common (18% each), followed by diabetes (8%) and thyroid abnormalities (6%). Nidhi et al. [10] (2022) reported comorbidities in 47.6% of patients, including hypothyroidism (40%), diabetes (25%), and hypertension (15%). Bafna BA et al. [11] (2021) observed obesity and hypertension in 18.6% each, diabetes in 6.6%, and thyroid disorders in 8%. Mishra S et al. [14] (2025) reported obesity as the most common comorbidity (42%).

In the present study, 52% had normal USG findings; among abnormalities, fibroids (16%) were most common, followed by thickened endometrium (15%), adenomyosis (11%), and PCOD (6%). Similar findings were reported by Nidhi et al. [10] (2022), Bafna BA et al. [11] (2021), and Choudhury SA et al. [15] (2020), highlighting fibroid and adenomyosis as common structural causes.

Histopathologically, proliferative endometrium was most frequent (67%), followed by simple hyperplasia without atypia (14%). Comparable results were noted by Bafna BA et al. [11] (2021), Mishra J et al. [14] (2023), and Nidhi et al. [10] (2022), confirming proliferative endometrium as the predominant pattern in abnormal uterine bleeding.

The present study showed that 76% of women reported reduction in menstrual blood flow at 3 months following LNG-IUCD insertion, indicating early therapeutic effectiveness. Similar findings were reported by Bafna BA et al. [11] (2021), who observed that intermenstrual spotting was common at 3 months (50.6%) but declined to 3% by 3 years, with 80.6% of women becoming amenorrheic. Likewise, Priyanka Dahiya et al. [16] (2025) demonstrated progressive reduction in blood loss, reaching 72.16% by 6 months. In addition, Gupta A et al. [17] (2024) reported significant reduction in endometrial thickness and menstrual flow after 6 months of LNG-IUS use. These findings are consistent with the present study and reaffirm the effectiveness of LNG-IUS in significantly reducing menstrual blood loss over time.

In the present study, the mean PBAC score before LNG-IUCD insertion was 265.68 ± 120.67, which significantly declined to 89.78 ± 59.42 at 3 months follow-up ($p < 0.00001$), indicating a marked

reduction in menstrual blood loss. Comparable findings were reported by Agarwal M et al. [18] (2024), who observed a significant decrease in mean PBAC score from 185 at baseline to 75 at follow-up ($p < 0.001$). Nidhi et al. [10] (2022) also demonstrated a progressive decline in median PBAC score from 280 (IQR 246–306) pre-insertion to 124 at 4 weeks, 45 at 12 weeks, and 32 at 24 weeks ($p < 0.001$). Priyanka Dahiya et al. [16] (2025) reported a reduction in mean PBAC score from 358 at insertion, with a 14.86% subjective reduction in blood loss at first follow-up. Similarly, Gupta A et al. [17] (2024) noted a fall in median PBAC score from 430 to 90 over six months. These findings consistently demonstrate that LNG-IUS insertion leads to a significant reduction in menstrual blood loss as assessed by PBAC scores.

In the current study, the majority of the population did not display any adverse effects; 32% had spotting, 18% reported white vaginal discharge, and 15% experienced back pain. Among the patients, 7% had spontaneous expulsion of the LNG IUCD, whereas 6% chose voluntary removal because to intolerable side effects such as backache and vaginal spotting lasting over one month. The majority of patients, 76.92%, chose hysterectomy, while the remaining 23.07% opted for hormonal treatment due to incomplete family size.

The Levonorgestrel IUCD is best non-surgical alternative for reduction of heavy Menstrual bleeding. It is superior to medical management as patient need not be compliant to taking medication on a regular basis. The LNG IUCD also serves the purpose of contraception and it also reduces dysmenorrhea.

Conclusion:

The present study concludes that the Levonorgestrel Intrauterine Contraceptive Device is a highly effective and safe non-surgical option for managing heavy menstrual bleeding, showing significant reduction in menstrual blood loss and PBAC scores within three months of insertion. In addition to providing reliable contraception and relief from dysmenorrhea, LNG-IUCD offers a convenient long-term alternative to medical therapy, particularly benefiting women in the reproductive age group.

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