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LNG-IUS: Emerging Non-Surgical Alternative in AUB Cases

Dr. Priyanka Dahiya[1], Dr. Vimla Dahiya[2], Dr. Atul Beniwal[3]

[1]Associate Professor, Dept. of Obstetrics and Gynaecology, Kalpana Chawla Government Medical College, Karnal. (Haryana)
[2]Senior Consultant and Director, Bharat Hospital, Sector-14, Sonipat. (Haryana)
[3]Associate Professor, Dept. of Pathology, Kalpana Chawla Government medical college, Karnal. (Haryana)

Corresponding Author: Dr. Vimla Dahiya

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ABSTRACT

Background: Abnormal uterine bleeding (AUB), affects 10-30% of reproductive-age group women and constitute about one-third of all outpatient gynecological visits. can normalize blood flow in women with heavy menstrual blood loss, as high level of levonorgestrel released locally induces considerable effects leading to the distinctive mode of therapeutic along with contraceptive action. The study aimed to study the efficacy of LNG-IUS in women with AUB.
Methods: This prospective interventional study was carried out at a private hospital in Haryana, over a period of 5years. A total of 50 women suffering from AUB, who underwent LNG-IUS insertion were included in study. The effectiveness of device was assessed by reduction in amount of blood loss, symptomatic improvement along with improvement in quality of life. The participants were followed-up after 1st, 3rd, and 6th month of insertion.
Results: The mean subjective percentage reduction in blood loss reduced from 13.64% at the first visit to 72.16% at the end of 6th month. The mean Hb level improved from 6.8gm/dl to 9.8gm/dl at the end of 6th month.
Conclusions: The LNG-IUS, provides a miraculous, cost-effective, non-surgical alternative in treatment of menorrhagia due to benign pathologies like endometrial polyps, adenomyosis and endometrial hyperplasia.

Keywords: Abnormal Uterine Bleeding, LNG-IUS, Menorrhagia, Mirena, Adenomyosis, Endometrial Polyp.

INTRODUCTION

Abnormal uterine bleeding (AUB) negatively impacts a woman's quality of life, since unexpected or excessive bleeding may result in psychological, physical, social, and sexual issues, hence requiring suitable and effective care. It is characterized by alterations in length, frequency, or volume of bleeding affecting 10-30% of women of reproductive age and accounts for approximately one-third of all outpatient gynecological consultations.1 Levonorgestrel containing intrauterine system (LNG-IUS) is a hormonal, progestin based IUCD is classified as long acting reversible contraception. Besides contraception, it has been found beneficial for long term medical management of AUB and other gynaecological disorders. Several studies have reported its superiority over

other treatment modalities (surgical and non-surgical) in terms of both higher efficacy and lesser side effects.2,3 This is a T-shaped moulded polyethylene outline device (T-body) with a steroid supply (made of a combination of levonorgestrel and polydimethylsiloxane), containing 52 mg of levonorgestrel around the upward stem. Levonorgestrel is released at an initial rate of 20 µg/day and declines to a rate of 14 µg following 5 years, which is still in the range of clinical effectiveness.4 The primary mechanism of action of the LNG-IUS seems to occur at the endometrial level, where the elevated concentration of local progestogen induces decidualization, epithelial atrophy, and direct vascular alterations.

Anipindi G concluded that LNG-IUS may serve as a therapy option throughout a woman's reproductive lifespan and facilitates a seamless transition to menopause.5

METHODS

It was a prospective interventional study conducted over five years (March 2020 to February 2025) at a private hospital in Haryana.

Inclusion criteria

1. Women in reproductive age group between 30-45 years with complaints of heavy menstrual bleeding
2. Size of uterus < 12 weeks.

Exclusion criteria

1. Pregnant and lactating women.
2. Any uterine anomaly
3. Known or suspected carcinoma of the uterus, cervix or breast.
4. Fibroids more than 3 cm or distorting the uterine cavity
5. Acute pelvic inflammatory disease
6. Genital bleeding of unknown aetiology
7. Liver or renal disease
8. Severe cardio-respiratory disorders
9. Taking hormone replacement therapy or tamoxifen.

Study procedure

A comprehensive assessment of the bleeding pattern, including frequency, regularity, and duration, together with an obstetric history, a meticulous general physical examination, and a per vaginum examination, was conducted. A speculum and vaginal examination were conducted to evaluate the location, size, shape, mobility, consistency, and tenderness of the uterus. Evaluation of both adnexal regions was performed, and pertinent findings were documented. A comprehensive hematological and biochemical workup was undertaken, including hemoglobin, total and differential leukocyte counts, ESR, blood glucose, lipid profile, routine urine analysis with microscopy, and TSH levels. In addition, gynecologic evaluations comprising a Pap smear, transvaginal ultrasonography, and endometrial biopsy were performed. The levonorgestrel intrauterine system (LNG-IUS) was inserted in an outpatient setting using the no-touch technique with a preloaded inserter, following bladder evacuation and measurement of uterocervical length. Patients were instructed to return for follow-up after one month.

Device efficacy was evaluated based on reduction in menstrual blood loss among patients with abnormal uterine bleeding (AUB), as well as improvements in quality of life and subjective symptom relief. Patients maintained menstrual diaries and recorded any side effects. Menstrual blood loss was quantified using the Pictorial Blood Loss Assessment Chart (PBAC), with scores >100 indicating heavy menstrual bleeding (HMB), <10 indicating hypomenorrhea, and scores between 10 and 99 considered within normal range.

Participants were asked to maintain a menstrual calendar for four months, marking days of spotting or bleeding. Follow-up assessments were conducted at 1-, 3-, and 6-months post-insertion. At each visit, patients underwent general, systemic, pelvic (to confirm LNG-IUS thread visibility), and breast examinations.

Transvaginal ultrasonography was performed at every follow-up to confirm LNG-IUS positioning and monitor for any new or evolving pelvic pathology, including ovarian cysts. Hemoglobin levels were reassessed during subsequent visits to evaluate hematological improvement.

RESULTS

Amongst 50 study participants, maximum number of patients were of AUB (L) followed by AUB (A). Table 1 elaborates the category of AUB amongst study participants.

Table 1: Categorization of AUB in study participants

Category of A.U.B.	No. of patients (n=50)	Percentage
AUB-P (polp)	3	6
AUB-A (Adenomyosis)	15	30
AUB-L (Leiomyoma)	18	36
AUB-M (Hyperplasia)	6	12
AUB-O (Ovulatory dysfunction)	8	16

Table 2 enlists the clinical symptoms observed in study participants. 38% patients, presented with menorrhagia followed by polymenorrhoea. 41.2% patients had uterine size corresponding to 12 weeks, followed by 57.9%, with uterine size between 8-10 weeks.

Table 2: Clinical presentation in study participants

Symptoms	Frequency	Percentage
Menorrhagia	19	38
Menometrorrhagia	10	20
Polymenorrhoea	11	22
Dysmenorrhoea	10	20

Table 3 summarizes the symptomatic response of various categories of AUB patients post LNG-IUS insertion in subsequent visits. In AUB(P) patients, 66.6% had polymenorrhoea at their first visit and33.3% of them had inter-menstrual spotting which was seen even at the end of 6 months. Patients were relieved of polymenorrhoea by the end of 6 months and developed oligomenorrhoea. 73.3% patients of AUB(A), presented with inter-menstrual bleeding which reduced over time and was experienced only by 13.3% cases. Polymenorrhoea which was reported by 26.6% on their first visit was relieved by the end of 6 months, with. 66.6% reporting oligomenorrhoea.

Majority patients with AUB(L) presented with inter-menstrual bleeding (83.3%), which reduced by the end of 6 moths to only 22.2%. In patients with AUB(L) post LNG-IUS insertion, 16.6% of patients with polymenorrhoea were ultimately relieved by the end of 6 months. Eventually, oligomenorrhoea followed by hypomenorrhoea was reported by 33% and 22.2% respectively on their follow up visits. 33.3% of patients in this category developed amenorrhoea by end of 6 months. Patients of AUB(M) presented with both polymenorrhoea and inter-menstrual spotting (50% each). 16.6% of them reported both reduction in amount and frequency of bleeding (16.6% each) by their second visit. Eventually 50% cases in this category reported amenorrhoea by end of 6 months of LNG-IUS usage.

In 62.5% patients with AUB(O) post LNG-IUS insertion had polymenorrhoea on their first visit, which was completely relieved by the end of 3rd month. Oligomenorrhoea was seen in 50% of the patients on their third follow up visit. 37.5% of the women had amenorrhoea by the end of 6th month. Intermenstrual bleeding was seen in 37.5% of the patients on their first follow up visit which reduced to 12.5% on their third follow up visit.

Table 3: Symptomatic response of study participants during subsequent visits after LNG-IUS insertion

Category of AUB	Symptoms	First visit (%)	Second visit (%)	Third visit (%)
AUB-P (n=3)	Polymenorrhoea	2 (66.6)	0	0
	Oligomenorrhoea	0	2(66.6)	2(66.6)
	Hypomenorrhoea	0	0	0
	Intermenstrual spotting	1(33.3)	1(33.3)	1(33.3)
	Amenorrhoea	0	0	0
AUB-A (n=15)	Polymenorrhoea	4(26.6)	0	0
	Oligomenorrhoea	0	7(46.6)	10(66.6)
	Hypomenorrhoea	0	0	3(20)
	Intermenstrual spotting	11(73.3)	8(53.3)	2(13.3)
	Amenorrhoea	0	0	0
AUB-L (n=18)	Polymenorrhoea	3(16.6)	0	0
	Oligomenorrhoea	0	6(33.3)	4(22.2)
	Hypomenorrhoea	0	0	4(22.2)
	Intermenstrual spotting	15(83.3)	9(50)	4(22.2)
	Amenorrhoea	0	3(16.6)	6(33.3)
AUB-M (n=6)	Polymenorrhoea	3(50)	1(16.6)	0
	Oligomenorrhoea	0	1(16.6)	0
	Hypomenorrhoea	0	1(16.6)	3(50)
	Intermenstrual spotting	3(50)	1(16.6)	0
	Amenorrhoea	0	2(33.3)	3(50)
AUB-O (n=8)	Polymenorrhoea	5(62.5)	0	0
	Oligomenorrhoea	0	3(37.5)	4(50)
	Hypomenorrhoea	0	0	0
	Intermenstrual spotting	3(37.5)	4(50)	1(12.5)
	Amenorrhoea	0	1(12.5)	3(37.5)

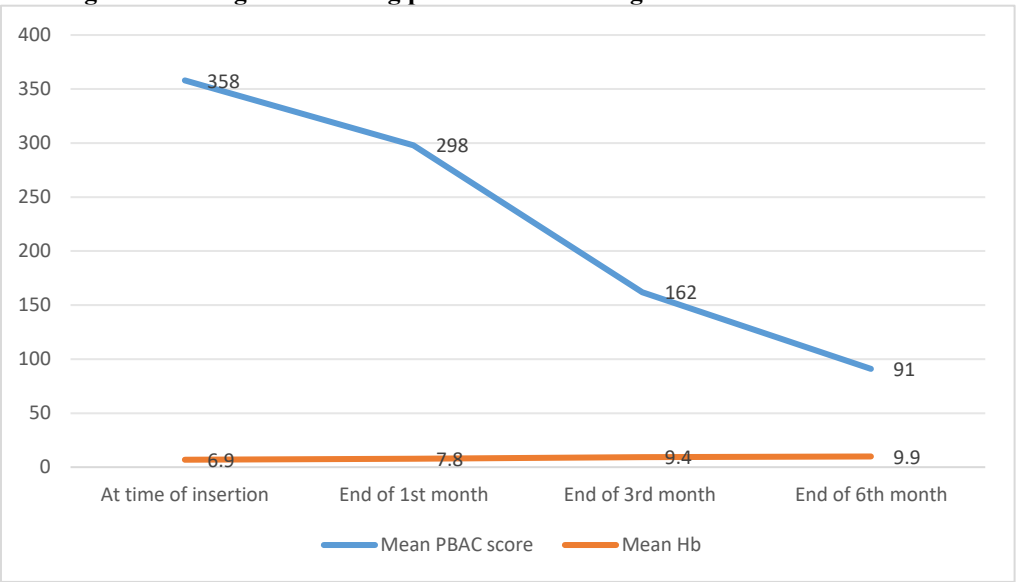
Table 4 shows symptomatic response of study participants post insertion during follow up visits. Polymenorrhoea and inter-menstrual spotting reduced significantly over time. 22% cases developed amenorrhoea and 20% had hypomenorrhoea by 3rd follow-up visit.

Table 4: Symptomatic response during subsequent visits post insertion.

Symptoms	First visit (%)	Second visit (3rd month) (%)	Third visit (6th month) (%)
Polymenorrhoea	17(34)	1(2)	0
Oligomenorrhoea	0	19(38)	20(4)
Hypomenorrhoea	0	1(2)	10(20)
Intermenstrual spotting	33(66)	23(46)	8(16)
Amenorrhoea	0	6(12)	12(22)

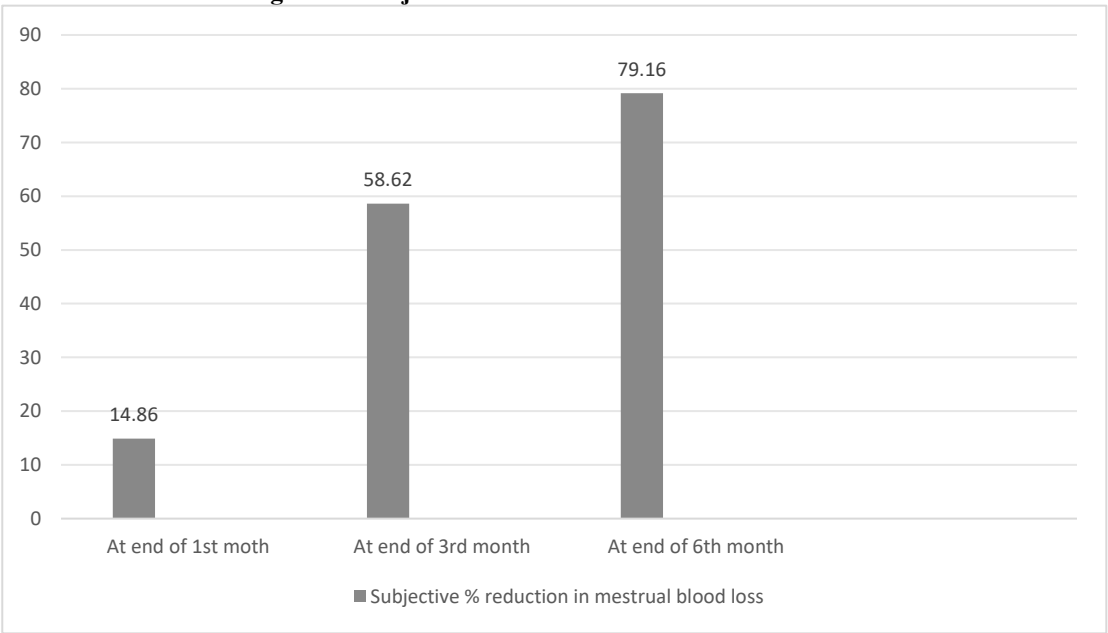
The mean PBAC score which was 358 at the time of insertion of LNG-IUS, reduced considerably over time to 91 at the end of 6 months post insertion. (Figure 1). The mean haemoglobin which was 6.6g/dl at the time of insertion showed improvement and rose to 9.9g/dl by the end of 6 months post insertion.

Figure 1: Changes in bleeding pattern and Haemoglobin levels after treatment.



The subjective percentage reduction in menstrual blood loss was 14.86%, 58.62% and 79.16% at the end of 1st, 3rd and 6th month respectively. (Figure 2) None of the patients reported expulsion of LNG-IUS, while only one patient opted for hysterectomy after six months of treatment.

Figure 2: Subjective reduction in amount of blood loss



DISCUSSION

Most of the women in our study (46.58%) fell in the age group of 35-40 years and the mean age was 38.3±3.2 years. Similar results were reported by Gupta et al[6] and Mani et al[7] where the majority of the patients were in the age group of 31-40 years with mean age, 36.40±5.19 years and 37.5±5.1 years respectively. Majority of the patients were of AUB (L) [36%] followed by AUB (A) which were 30%. AUB due to ovulatory dysfunction was 16%. these findings are similar to the study conducted by Raghuwanshi et al in 2020, where AUB-L was found to be the most frequent cause of AUB accounting for almost 26.3% followed by AUB-A which was found in 24.0% of the cases and AUB-O was the

most common cause of AUB among non-structural causes being similar to our study.[8] Further, our findings are also supported by study done by Singh et al in 2017, who reported 30% cases in AUB(L) category and 29.6% in AUB(A) category.[9]

In our study, at the end of 6 months 40% of the patients had oligomenorrhoea followed by 22% of the patients who developed amenorrhoea and only merely 8% of the patients continued having intermenstrual spotting. Similar findings were also supported by Mani et al in 2022, who reported oligomenorrhoea and inter-menstrual spotting in 38.1% cases and amenorrhoea in 16.6% women.[10] These results were comparable to the study conducted by Desai et al where after 6 months of insertion of LNG-IUS, 22.5% of women had amenorrhoea and 7.5% of women continued to have HMB.[11] Our study observed no HMB after 6 months of LNG-IUS insertion. Kriplani et al reported 13.79% cases of amenorrhoea and 32.75% cases with intermenstrual spotting, 6 months post insertion.[12]

Post LNG-IUS insertion, symptomatic relief in menstrual pattern was evaluated (by PBAC scores) and it was seen that at the time of insertion, the mean PBAC score was 358 and at the first follow up visit the mean subjective percentage reduction of blood loss was 14.86% and 79.16% at end of 6th month. The mean Hb level before commencing treatment was 6.9 and it rose to 9.9 at the end of 6 months. In a similar study conducted by Kriplani et al and Mani et al the mean subjective percentage reduction of blood loss at the end of 6 months of post LNG-IUS insertion was 80% and 72.16% respectively, whereas the mean Hb at the end of 6 months also showed a rise.[10,12]

Patient satisfaction rate was fairly good, 94.6% at the end of 6 months usage. However, threads being felt by partner, and intermenstrual spotting were the only reported reasons for dislike. None of our patients reported expulsion of LNG-IUS. The result were almost similar to the study conducted by Mani et al, Dhamangaonkar et al and Desai RM where client satisfaction was 92.8%, 91.42% and 82.5% at the end of 6 months and 1 year respectively.[10,14,11] One patient (2%) in our study requested removal of LNG-IUS after 6 months of treatment and opted for hysterectomy, whereas in study conducted by Mani et al and Durga et al, 7.14% and 7.1% patients requested removal and opted for hysterectomy after six months of treatment. Dhamangaonkar et al however reported hysterectomy in 5.7% cases. Hence, our study has proved that Mirena is an excellent non-surgical alternative in AUB cases.

CONCLUSION

LNG-IUS has been found to be preferable non-surgical option in AUB women for effective management with exceptional patient satisfaction and compliance. It reduces the menstrual blood loss and helps improve anemia. It can be securely used in patients with prior cesarean section, myomectomy, obesity. It is also a very good option for women who have AUB and desire contraception. Side effects are typically mild, and in most cases patient reassurance is sufficient to promote continued use. Compared to hysterectomy or endometrial ablation, the LNG-IUS offers superior health-related quality of life outcomes and is more cost-effective. Therefore, the study concludes that the levonorgestrel-releasing intrauterine system is an excellent, non-surgical, reversible treatment option for menorrhagia that also preserves fertility.

Declaration by Authors

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Conflict of Interest: None

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