

Effectiveness and Safety of Levonorgestrel Intrauterine Device in Abnormal Uterine Bleeding, Adenomyosis and Perimenopausal Bleeding Patients

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ABSTRACT

Background: The Levonorgestrel-releasing intrauterine system was inserted in patients with conditions like Abnormal Uterine Bleeding (AUB), adenomyosis and Perimenopausal Bleeding (PMB). This study aimed to find the effectiveness and safety of the intrauterine device in AUB, adenomyosis and PMB. **Materials and Methods:** This observational study enrolled 100 patients with AUB, adenomyosis and PMB who had levonorgestrel IUD inserted for treatment between the years 2015 to 2022. The data has been collected from the Department of Obstetrics and Gynecology at Krishna Institute of Medical Sciences, Secunderabad and analyzed based on the Institutional outcome scoring form. The post-insertion responses, expulsion rates and clinical outcomes towards IUD were observed in patients after insertion. **Results:** The analysis of post-insertion responses showed a significant statistical *P* value of 0.001 which implies the effectiveness of IUD. This study resulted in a 90% positive clinical outcome which implies the safety of levonorgestrel IUD. The expulsion rate was also very low that was 5 out of 100 patients had the device expelled. **Conclusion:** The levonorgestrel IUD showed significant positive clinical outcomes in patients with AUB, Adenomyosis and PMB with low expulsion rates and can be considered a good alternative for conservative management of AUB, Adenomyosis, and perimenopausal bleeding.

Keywords: Intrauterine device, Abnormal uterine bleeding, Adenomyosis, Peri Menopausal Bleeding.

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INTRODUCTION

The levonorgestrel-releasing Intrauterine Device (IUD) is used in the treatment of AUB and as LARC (Long-Acting Reversible Contraceptive). It is an Intrauterine device that contains 52 mg of levonorgestrel (progesterone), released at a range of 20 mcg/day¹ and after five years it is decreased to half of its original value. IUD is removed by the end of the fifth year and can be replaced with a new one if necessary. The intrauterine device is inserted into the endometrial cavity of the patient. The horizontal arms of the device are folded and will be placed in the applicator tube. It is gently implanted in the uterus after the tube is introduced into the cervical canal. strings will be trimmed so that they don't protrude too far into the vagina and the length of the string is recorded.

Cramping, dizziness, fainting, or a slower-than-normal heart rate may occur at the time of insertion.^{2,3} This device is inserted in conditions like endometriosis, adenomyosis, and heavy menstrual bleeding. This device is contraindicated for conditions like uterine abnormality, pelvic inflammatory disease, abortion, postpartum endometritis, and acute cervicitis. The common side effects of this device include amenorrhea, bleeding or spotting between periods, heavy bleeding during the first few weeks after device insertion, abdominal and pelvic pain, headache, back pain, dizziness, nausea, tenderness of the breast and weight gain.⁴ AUB is described as irregularities in the menstrual cycle involving frequency, regularity, duration and volume of flow outside the pregnancy. IUD is used in types of AUB like AUB-Endometrial Hyperplasia (AUB-E), AUB- Ovulatory dysfunction (AUB-O), AUB-Leiomyoma (AUB-L), AUB-Adenomyosis (AUB-A).⁵ Adenomyosis is a condition in which the endometrium grows adjacent to the inner lining of the uterus, causing the uterine wall to grow in size causing heavy, painful, prolonged periods, and painful cramps.⁶



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Peri menopausal Bleeding (PMB) is defined as the time from which changes in the pattern of the menstrual cycle are observed one year after the last menstrual period.⁷ This study was focused on the effectiveness and safety of Levonorgestrel IUD in abnormal uterine bleeding, adenomyosis and perimenopausal bleeding patients.

MATERIALS AND METHODS

This study was conducted at the Department of Obstetrics and Gynecology, Krishna Institute of Medical Sciences (KIMS), Secunderabad after getting approval from the institutional ethical committee. It was a retrospective observational study with a sample size of 100 from the year 2015 to 2022 conducted in a tertiary care hospital. The brand name of the Levonorgestrel IUD used in this study was (MIRENA manufactured by Bayer Pharmaceuticals, USA).⁸ The data was collected from the KIMS hospital database). The institutional outcome scoring form included questions related to post-insertion side effects in 1 month, 6 months and 1 year. By following the answers of patients by contacting via phone we collected the information and gave outcome scoring. The Institutional Outcome Scoring form was used to get good, average and poor outcomes after insertion of the device in patients with AUB, Adenomyosis and PMB.

The inclusion criteria for the enrollment of female patients were between the ages 24 to 60 and with conditions like adenomyosis, AUB and PMB.

The exclusion criteria included confirmed or suspected pregnancy, abortion in the previous three months, renal dysfunction, liver dysfunction, malignant tumour, distorted uterine cavities and endometrial cancers like cervical cancer.

Statistical analysis

All the data collected were tabulated and categorized to apply statistical methods like frequency, percentage and one-way ANOVA to find the *p*-value. The data was collected by using patient reports.

RESULTS

In this study, we found that 57% of patients aged between 31 to 45, 39% were aged between 45 to 60, 2% were aged less than 30 and 2% were aged greater than 60. Table 1 represents that total of 100 patients was included in the study out of them 58% were AUB-E, 25% were AUB-A, 9% were AUB-L, 7% were PMB, 1% were AUB-C, *p*-value was found to be not significant. Our study implied that the most common condition among females was AUB-E.

Table 2 represents histopathological reports which imply that disordered Proliferative endometrium was most common in patients with 27%, 21% with proliferative endometrium, 20% with

secretory endometrium and 21% with other findings (polyps, nil curetting) among 100 patients.

Clinical findings implied that a bulky uterus was the most common finding (59%) and the uterus was normal in 41%. Table 3 represents USG findings with 9% fibroids, 28% thickened endometrium and 24% adenomyosis changes.

Table 4 outlines post-insertion side effects, at 1 month we found spotting (44%) was the most common side effect followed by no side effect after insertion (43%), regular normal bleeding (12%) and expulsion was found in 1% of patients.

Table 5 outlines post-insertion side effects at 6 months in which we found regular normal bleeding in 50% of patients, decreased frequency of periods in 38.1% of the population, spotting in 6.57%, expulsion in 2.63% and removal in 2.63%. *P* value was found to be significant.

Table 6 outlines post-insertion side effects at 1 year, decreased frequency of periods in 46.8%, regular normal bleeding in 28.1% and amenorrhea in 25% of patients. *P* value was found to be significant.

Finally, in this study, we found that IUDs were safe and effective in 90% of patients and in 10% of patients it was removed, expelled or showed no effect.

DISCUSSION

In this study, we found that 57% of patients suffering from conditions like PMB, AUB and Adenomyosis were between 31 to 45 years of age and 2% were less than 30 years of age and greater than 60 years of age. Most common condition females presented with were AUB-E and the least common were PMB and AUB-C. Similar observations documented by Shyamala Kaitala *et al.* 2022 reported that a greater number of patients were suffering from AUB- A and HMB and the least were AUB-L.⁹ The number of patients suffering from AUB and the age group observed in our study is as per the earlier observations reported by Pallavi C. Dhamangaonkar *et al.* 2015.¹⁰ The findings of our study reflect that among the patients presented with AUB, PMB and Adenomyosis histopathological conditions, disordered proliferative endometrium was most common and secretory endometrium was less common. In this study we found that in post-insertion side effects after 1, 6 and 12 months we found that spotting was more in 1st month when compared to the 6th month and 1-year, regular normal bleeding was less in 1st month increased in 6th month and again decreased after 1 year, Decreased frequency of periods after 6 months was found to be less when compared to 1 year, expulsion was seen after 1 month in 1% of patient and 2.63% of patients in 6th month and no expulsion after 1 year, removal of IUD due to severe side effects after 6th month of insertion was seen in 2.63% of patients. The results are similar to the results observed by Pallavi C. Dhamangaonkar *et al.* 2015, and Gayatri Anipindi, and Vani I 2017 who concluded that Amenorrhea was reported

Table 1: Outcomes after insertion of levonorgestrel IUD in patients with conditions like PMB, AUB-A, AUB-C, AUB-E, and AUB-L.

Diagnosis of Conditions	Frequency (Percentage)	Outcome*			p value
		Good	Average	Poor	
Peri menopausal Bleeding.	7 (7)	2 (28.6)	3 (42.9)	2 (28.6)	0.114
Abnormal Uterine Bleeding Type A.	25 (25)	19 (76)	3 (12)	3 (12)	
Abnormal Uterine Bleeding Type C.	1 (1)	1 (100)	0 (0)	0 (0)	
Abnormal Uterine Bleeding Type E.	58 (58)	30 (51.7)	23 (39.7)	5 (8.6)	
Abnormal Uterine Bleeding Type L.	9 (9)	4 (44.4)	5 (55.6)	0 (0)	
Total	100				

Note: *Followed questionnaire.

Table 2: Percentage of Histopathology Reports in Patients with PMB, AUB and Adenomyosis with no significant p-Value.

Histopathology Reports	Frequency (Percentage)	p Value
Disordered Proliferative Endometrium.	27 (27)	0.114
Proliferative Endometrium.	21 (21)	
Secretory Endometrium.	20 (20)	
Other Findings (Polyps, nil curettings).	21 (21)	
Not Done.	11 (11)	
Total	100	

Table 3: Percentage of USG Findings in Patients with PMB, AUB and Adenomyosis with no significant p-Value.

USG findings	Frequency (Percentage)	p Value
Fibroids	9 (9)	0.216
Thickened Endometrium	28 (28)	
Adenomyosis changes	24 (24)	
Normal Findings	39 (39)	
Total	100	

Table 4: Percentage and Outcome of Side effects at 1 month after the insertion of Intrauterine device in Patients with PMB, AUB and Adenomyosis with significant p-Value.

Post Insertion Side effects at 1 month	Frequency (%)	Outcome			p value
		Good (%)	Average (%)	Poor (%)	
Spotting	44 (44)	30 (68.2)	12 (27.3)	2 (4.5)	<0.001
Regular normal Bleeding	12 (12)	12 (100)	0 (0)	0 (0)	
Expelled	1 (1)	0 (0)	0 (0)	1 (100)	
No Effect	43 (43)	14 (32.6)	22 (51.2)	7 (16.3)	
Total	100	56 (56)	34 (34)	10 (10)	

Note: *Followed questionnaire.

Table 5: Percentage and Outcome of Side effects at 6 months after the insertion of Intrauterine device in Patients with PMB, AUB and Adenomyosis with significant p-Value.

Post-insertion Side effects at 6 months	Frequency (%)	Outcome			p Value
		Good(%)	Average (%)	Poor (%)	
Spotting	5 (6.57)	0 (0)	5 (100)	0 (0)	<0.001
Regular normal Bleeding	38 (50)	24 (63.2)	14 (36.8)	0 (0)	
Expelled	2 (2.63)	0 (0)	0 (0)	2 (100)	
Decreased Frequency of Periods	29 (38.1)	27 (93.1)	2 (6.9)	0 (0)	
Removed	2 (2.63)	0 (0)	0 (0)	2 (100)	
Total	76	51	21	4	

Note:*Followed questionnaire

Table 6: Percentage and Outcome of Side effects at 1 year after the insertion of Intrauterine device in Patients with PMB, AUB and Adenomyosis with significant p-Value.

Post insertion Response at 1 year	Frequency (%)	Outcome			p Value
		Good (%)	Average (%)	Poor (%)	
Amenorrhea	16 (25%)	16 (100)	0 (0)	0 (0)	<0.001
Decreased Frequency of periods	30 (46.8%)	4 (22.2)	14 (77.8)	0 (0)	
Regular normal Bleeding	18 (28.1%)	23 (76.7)	7 (23.3)	0 (0)	
Total	64				

Note: *Followed questionnaire.

in 73.3%, of heavy bleeding was found in 02.2% and spotting in 25% of patients after 1 year of insertion and Amenorrhea in 10% of patients at the end of 6 months and 40% at the end of 1 year respectively.¹⁰⁻¹² Overall, this study indicates that Levonorgestrel IUD is the safest and most effective with minimal side effects in conditions like AUB, Adenomyosis and PMB.

CONCLUSION

Levonorgestrel intrauterine device is effective and safe in conditions like Abnormal uterine bleeding, Adenomyosis and Peri menopausal bleeding with minimal side effects like spotting. The expulsion rate was also less when compared to other studies. The quality of life was improved in patients who were treated with IUD. To avoid surgery in AUB, Adenomyosis and PMB patients Levonorgestrel IUD was found to be safe and effective.

LIMITATIONS

The limitation of the study includes the involvement of a small number of patients which gave a limited overview of post-insertion side effects and effectiveness of Levonorgestrel IUD

in patients with AUB, Adenomyosis and PMB therefore further studies in this aspect involving a large number of patients with different age groups are necessary.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

AUB: Abnormal Uterine Bleeding; **PMB:** Perimenopausal Bleeding; **IUD:** Intrauterine Device; **LARC:** Long-Acting Reversible Contraceptive; **AUB-E:** Abnormal Uterine Bleeding-Endometrial Hyperplasia; **AUB-O:** Abnormal

Uterine Bleeding–Ovulatory Dysfunction; **AUB-L**: Abnormal Uterine Bleeding–Leiomyoma; **AUB-A**: Abnormal Uterine Bleeding–Adenomyosis.

SUMMARY

The intrauterine device is beneficial with minimal side effects, expulsion rate and increased compliance to the device in patients with abnormal uterine bleeding, adenomyosis and perimenopausal bleeding patients.

REFERENCES

1. Yu Y, Zhou Z, Wang L, Liu J. Effect of mirena intrauterine device on endometrial thickness, quality of life score, and curative effect in patients with perimenopausal abnormal uterine bleeding. *Comput Math Methods Med.* 2022; 2022:5648918. doi: 10.1155/2022/5648918, PMID 36238482.
2. Levonorgestrel (intrauterine route) proper use. Mayo Clinic Publications. Available from: <https://www.mayoclinic.org/drugs-supplements/levonorgestrel-intrauterine-route/proper-use/drg-20073437>.
3. Bhatt KG. Levonorgestrel intrauterine system insertion. In: Heath CB, Sulik SM, editors. *Primary care procedures in women's health: an international guide for the*

- primary care setting. Cham: Springer International Publishing; 2020:135-53. doi: 10.1007/978-3-030-28884-6_13.
4. Agarwal N, Chopra S. Mirena: just a contraceptive device? or A modality with diverse clinical applications! *J Fam Med Prim Care.* 2022;11(9):5031-7. doi: 10.4103/jfmpc.jfm_pc_2545_20, PMID 36505540.
5. Whitaker L, Critchley HOD. Abnormal uterine bleeding. *Best Pract Res Clin Obstet Gynaecol.* 2016;34:54-65. doi: 10.1016/j.bpobgyn.2015.11.012, PMID 26803558.
6. Bulun SE, Yildiz S, Adli M, Wei JJ. Adenomyosis pathogenesis: insights from next-generation sequencing. *Hum Reprod Update.* 2021;27(6):1086-97. doi: 10.1093/humupd/dmab017, PMID 34131719.
7. Perimenopausal bleeding and bleeding after menopause. American College of Obstetricians and Gynecologists [internet]. Available from: <https://www.acog.org/womens-health/faqs/perimenopausal-bleeding-and-bleeding-after-menopause>.
8. Learn About Mirena® IUD [internet] [cited 2023]. Available from: <https://www.mirena-us.com/>.
9. Kaitala S, Suvidha N, Lakshmi Durga KNV. A prospective study on the efficacy of levonorgestrel-releasing intrauterine device in abnormal uterine bleeding. 2022;14(9):1127-36.
10. Dhamangaonkar PC, Anuradha K, Saxena A. Levonorgestrel intrauterine system (Mirena): an emerging tool for conservative treatment of abnormal uterine bleeding. *J Midlife Health.* 2015;6(1):26-30. doi: 10.4103/0976-7800.153615, PMID 25861205.
11. Li L, Leng J, Jia Shuangzheng, Lang J. Treatment of symptomatic adenomyosis with the levonorgestrel-releasing intrauterine system. *Int J Gynaecol Obstet.* 2019;146(3):357-63. doi: 10.1002/ijgo.12887, PMID 31194884.
12. GayatrrAnipindi VI. Role of levonorgestrel releasing intrauterine device in management of heavy menstrual bleeding: A safe and effective option for all PALM COEIN variants. 2017;4(12):127-31.

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