ORIGINAL ARTICLE
Ginecol Obstet Mex 2024; 92 (6): 170-178.

https://doi.org/10.24245/gom.v92i6.9564

# Assessment of levonorgestrel releasing intrauterine system (LNG-IUS ) in women with heavy menstrual bleeding in a referral center.

## Evaluación del sistema intrauterino liberador de levonorgestrel (SIU-LNG) en mujeres con sangrado menstrual abundante

**Sandra Carolina Lizarazo Gutiérrez,[1] Maribel Páez Méndez,[2] José Fernando de los Ríos Posada,[3] Claudia Cristina López Ruiz,[4] Martha Carolina Cifuentes Pardo,[4] José Bareño Silva[5]**

**Abstract**

**OBJECTIVE:** To describe the clinical results obtained with patients treated with Levonorgestrel-releasing intrauterine system (LNG-IUS) for heavy menstrual bleeding, at the Del Prado Clinic, in Medellin, Colombia. Also, to report the degree of satisfaction, adherence, main side effects, and the percentage of patients who required hysterectomy.

**MATERIALS AND METHODS:** Observational, cross-sectional, analytical study, which included patients with heavy menstrual bleeding, treated between January and December 2012 in a reference center in Medellin, Colombia. The clinical results and satisfaction with the method were evaluated.

**RESULTS:** Two hundred and thirty-one patients were studied, with an age range of 30 to 55 years, with abundant menstrual bleeding. Before the placement of the system, 103 patients (44.6%) had not received any treatment. There was a statistically significant difference in the length of the menstrual cycles before and after LNG-IUS placement, in patients with cycles shorter than 24 days (mean difference 0.377; 95%CI: 0.302-0.451, 46.8% in comparison to 9.1%; p = 0.00). Thirty-two percent of the patients (N = 74) had amenorrhea. When evaluating the average days of bleeding and the PBAC score (Pictorial Blood Assessment Chart), there was a statistically significant difference before and after placement. The most common adverse effect was staining (20.3%). After the placement of LNG-IUS, 82.7% (n = 191) of the patients were satisfied or very satisfied, and only 18.6% underwent hysterectomy.

**CONCLUSION:** The outcomes of the study showed that the LNG-IUS significantly decreases blood loss in women with heavy menstrual bleeding, and it is a well-tolerated and accepted method.

**KEYWORDS:** Levonorgestrel-releasing intrauterine system (LNG-IUS); Heavy menstrual bleeding; Pictorial Blood Assessment Chart (PBAC); Hysterectomy.

**Resumen**

**OBJETIVO:** Describir los desenlaces clínicos de las pacientes atendidas en la Clínica del Prado Medellín, Colombia, a quienes se les insertó el SIU-LNG de 52 mg como tratamiento para cohibir el sangrado menstrual abundante. Además, reportar el nivel de satisfacción, el apego, los principales efectos secundarios derivados de su uso y el porcentaje de pacientes que requirieron histerectomía.

**MATERIALES Y MÉTODOS:** Estudio observacional, transversal y analítico al que se incluyeron pacientes con sangrado menstrual abundante tratadas entre enero y diciembre

[1] Obstetrician-Gynecologist, Minimally Invasive Gynecological Surgery.
[2] Obstetrician-Gynecologist, Women's Video Diagnostic Unit.
[3] Chief of the Minimally Invasive Gynecological Surgery Unit.
[4] Obstetrician-Gynecologist, Minimally Invasive Gynecological Surgery.
[5] Epidemiologist adviser, CES University.
Del Prado Clinic, Medellin, Colombia.

**Received:** February 2024
**Accepted:** May 2024

**Correspondence**
Sandra Carolina Lizarazo Gutiérrez
carinfiu@hotmail.com

**This article should be cited as:** Lizarazo-Gutiérrez SC, Páez-Méndez M, De los Ríos-Posada JF, López-Ruiz CC, Cifuentes-Pardo MC, Bareño-Silva J. Evaluación del uso del sistema intrauterino liberador de levonorgestrel (SIU-LNG) en mujeres con sangrado menstrual abundante en un centro de referencia. Ginecol Obstet Mex 2024; 92 (6): 170-178.

de 2012 en un centro de referencia de la ciudad de Medellín, Colombia. Se evaluaron los desenlaces clínicos y la satisfacción con el método.

**RESULTADOS:** Se estudiaron 231 pacientes con límites de edad de 30 y 55 años, con sangrado menstrual abundante. Antes de la inserción, 103 pacientes (44.6%) no habían recibido ningún tratamiento. Se encontró una diferencia estadísticamente significativa en la duración de los ciclos menstruales antes y después de la inserción a pacientes con ciclos menores de 24 días (diferencia de medias 0.377; IC95%: 0.302-0.451, 46.8% en comparación con 9.1%; p = 0.00). El 32% (n = 74) de las pacientes tuvieron amenorrea. Al evaluar el promedio de días de sangrado y puntaje PBAC (*Pictorial Blood Assessment Chart*) se encontró una diferencia estadísticamente significativa antes y después de la inserción. El efecto adverso más común fue el manchado (20.3%). Después de la inserción del SIU-LNG, 82.7% (n = 191) de las pacientes estuvieron satisfechas o muy satisfechas y solo a 18.6% se les practicó histerectomía.

**CONCLUSIÓN:** Los desenlaces de este estudio indicaron que el SIU-LNG disminuye, significativamente, las pérdidas sanguíneas en mujeres con sangrado menstrual abundante; es un método bien tolerado y aceptado.

**PALABRAS CLAVE:** Sistema intrauterino liberador de levonorgestrel (SIU-LNG); Sangrado menstrual abundante; Pictorial Blood Assessment Chart (PBAC); Histerectomía.

## BACKGROUND

Heavy menstrual bleeding is one of the most frequent reasons for consultation in the gynecological practice for women in reproductive age (between 5 to 30%); it is a common and debilitating problem, with high direct and indirect costs,[1-2] which affects quality of life.[3]

The standardization of evaluation tools to measure abnormal uterine hemorrhage is under development by the CROWN (Core Outcomes in Women's and Newborn Health ) initiative, with the aim of solving the generalized and unjustified variation in women's health reports.[4-5]

The International Federation of Gynecology and Obstetrics (FIGO) introduced in 2011 new terminology for heavy menstrual bleeding in women in reproductive age,[6] with the goal of avoiding poorly defined, or previously confused terms.[7-9] With this aim, they devised the acronym PALM COEIN: polyps, adenomyosis, leiomyomas, malignancy and hyperplasia , coagulopathies, ovulatory disorders, endometrial disorders, iatrogenic causes, and not otherwise classified.[10-11] The system facilitates a precise diagnosis and informs of the treatment options; whose first line is the physician, and which includes hormonal and non-hormonal ones. The levonorgestrel releasing intrauterine system (LNG-IUS) is among the first ones.[12]

While much relevant information is still unreported, there is evidence that confirms that LNG-IUS decreases bleeding. However, hysterectomy improves the quality of life of patients, without many adverse side effects, and the costs associated with the procedure are lower than with other options.[1] There is little information about specific populations, which makes it difficult to make treatment decisions in our population.[13-14] Thus, the goal of the study was to describe the clinical results of patients who had a 52 mg LNG-IUS placed as treatment for heavy menstrual bleeding, seen at the Del Prado Clinic in Medellin, Colombia. Another goal was to report the satisfaction, adherence, and main side

effects derived from its use, and the percentage of patients who required hysterectomy.

## MATERIALS AND METHODS

Observational, cross-sectional, analytical study, with a retrospective data-collecting phase, conducted between January and December 2012, at the Del Prado Clinic, in Medellín, which is a reference treatment center for patients with benign gynecologic conditions. *Study variables*: relevant clinical and demographic data for the analysis of the changes in the pattern of bleeding (calculated with the PBAC score), satisfaction (general perception of the patient), and final percentage of hysterectomies in patients with LNG-IUS. *Inclusion criteria*: women between 30 and 55 years with a diagnosis of heavy menstrual bleeding, who had an LNG-IUS inserted as treatment. *Exclusion criteria*: patients with a uterus larger than 12 cm, postmenopausal uterine hemorrhage, malignant, or pre-malignant lesions, submucosal myomas, endometrial polyps, pelvic inflammatory disease, non-uterine bleeding, and patients who did not accept to participate in the study.

Patients were contacted by telephone 5 years after the placement of a 52 mg LNG-IUS, to evaluate the symptoms and characteristics of the bleeding before and after said placement. The digital medical records were used as a secondary source. The PBAC score (Pictorial Blood Assessment Chart)[15-16] was used to categorize the severity of the heavy menstrual bleeding. This alternative semi-quantitative system uses a chart to objectively describe and quantify the amount of menstrual bleeding, and its relation to the number of towels or tampons used by the patients.[15,17]

After obtaining this information, the survey data was charted in Excel and processed in the SPSS V. 21 software.[18] A descriptive analysis of the sociodemographic and relevant clinical variables was made first, which was expressed as percentages for qualitative variables, and central tendency and variation for quantitative variables. Afterwards, a crossed analysis was made with the variables of interest, in order to reach the study goals. A before-and-after comparison was made with a paired Student t test, and significance was set at $p < 0.05$. The study was approved by the Ethics Committee of the CES University, and the Del Prado Clinic.

## RESULTS

Data was obtained from 231 patients. The age, body mass index, and parity are shown in **Table 1**. Before the system's placement, 42% (n = 97) patients had received oral contraceptives to treat bleeding, and 44.6% (n = 103) had not received any kind of treatment. Fifty-one patients reported having been absent from work due to the bleeding, and more than half of them, at some point suffered anemia.

When comparing the length of menstrual cycles before and after the system's placement on patients with cycles shorter than 24 days (46.8 *vs* 9.1%; p = 0.00, mean difference 0.377; CI95%: 0.302-0.451), a statistically significant difference

**Table 1.** Demographic and clinical characteristics of patients with abundant menstrual bleeding, treated with 52 mg LNG-IUS

| Characteristics | n = 231 Absolute frequency (%) |
|---|---|
| Mean age (SD) | 44.27(6.8) |
| Mean body mass index (SD) | 26.18 (4.3) |
| Mean parity (SD) | 2.05 (1.1) |
| Treatments before LNG IUS | |
| Tranexamic acid | 8 (3.5) |
| Oral contraceptives | 97 (42) |
| Injected contraceptives | 18 (7.8) |
| Other | 5 (2.2) |
| None | 103 (44.6) |
| Anemia diagnosis before the insertion of 52 mg LNG IUS | 130 (56.2) |
| Work absenteeism due to bleeding | 51 (22.1) |


https://doi.org/10.24245/gom.v92i6.9564

was found. For patients with cycles between 24 and 38 days there was no significant difference (50.6% *vs* 46.8% p = 0.40, mean difference 0.039; CI95%: 0.052-0.13). Thirty-two percent of the patients had amenorrhea. **Table 2**

Regarding the days of bleeding, a statistically significant difference was found, before and after the placement of the system: bleeding between 4 to 8 days, 46.3% vs 26% (p = 0.000, mean difference 0.203; CI95%: 0.118-0.289), and bleeding for more than 8 days 50.6 vs 10% (p = 0.000, mean difference: 0.407; CI95%: 0.332-0.482). **Table 2**

When evaluating the PBAC score, there were statistically significant differences, with a mean of 1900 in the pre-placement, and a mean of 748 in the post-placement (p = 0.000, mean difference 1.656; 95%CI: 1.381-1.932). There were also significant differences in the average length of the menstruation in days, with a mean of 10.37 days pre-insertion, and 3.94 days post-insertion (p = 0.000; mean difference 6.43; CI95%: 5.43-7.42). **Table 2**

The most frequently reported adverse effects were staining (20.3%), weight gain (17.3%), pelvic pain (16.5%), headache (13.3%), mastodynia (10%), hair loss (8.2%), acne (6.1%), and body hair increase (2.6%). **Figure 1**

Eighteen point six percent (n = 43) of the patients underwent hysterectomy indicated for either adverse effects, absence of improvement or worsening of bleeding, spontaneous expulsion, accidental extraction, or other causes (endometriosis, adenomyosis, malign tumor, myomatosis). **Figure 2**

The degree of satisfaction with the LNG-IUS was of 82.7% for satisfied or very satisfied, and 17.3% were dissatisfied or very dissatisfied. **Figure 3**

## DISCUSSION

The National Institute for Health and Clinical Excellence defines heavy menstrual bleeding as menstrual blood loss which interferes with physical, emotional, social, and material quality

**Table 2.** Changes in cycle characteristics before and after LNG-IUS insertion

| Outcome | LNG IUS | | p | Mean difference | 95CI% | |
|---|---|---|---|---|---|---|
| | Before | After | | | | |
| | Absolute frequency (%) | Absolute frequency (%) | | | | |
| Cycles (days) | | | | | | |
| Less than 24 days | 108 (46.8) | 21 (9.1) | 0.000 * | 0.377 | 0.302 | 0.451 |
| Between 24 and 38 days | 117 (50.6) | 108 (46.8) | 0.402 | 0.039 | -0.052 | 0.13 |
| More than 38 days | 6 (2.6) | 9 (3.9) | 0.000 | -0.013 | -0.045 | 0.019 |
| Irregular and variable cycles | 0 (0%) | 19 (8.2) | 0.000 * | -0.078 | -0.114 | -0.041 |
| Bleeding (days) | | | | | | |
| 4 to 8 days | 107 (46.3) | 60 (26) | 0.000 * | 0.203 | 0.118 | 0.289 |
| More than 8 days | 117 (50.6) | 23 (10) | 0.000 * | 0.407 | 0.332 | 0.482 |
| Less than 4 days | 7 (3) | 70 (30.3) | 0.000 * | -0.273 | -0.336 | -0.209 |
| PBAC: Mean (SD) | 1900.7 (1993.1) | 243. 9 (748.9) | 0.000 * | 1656.77 | 1381.5 | 1932.0 |
| Days mean (SD) | 10.37 (5.7) | 3.94 (5.2) | 0.000 * | 6.43 | 5.432 | 7.428 |

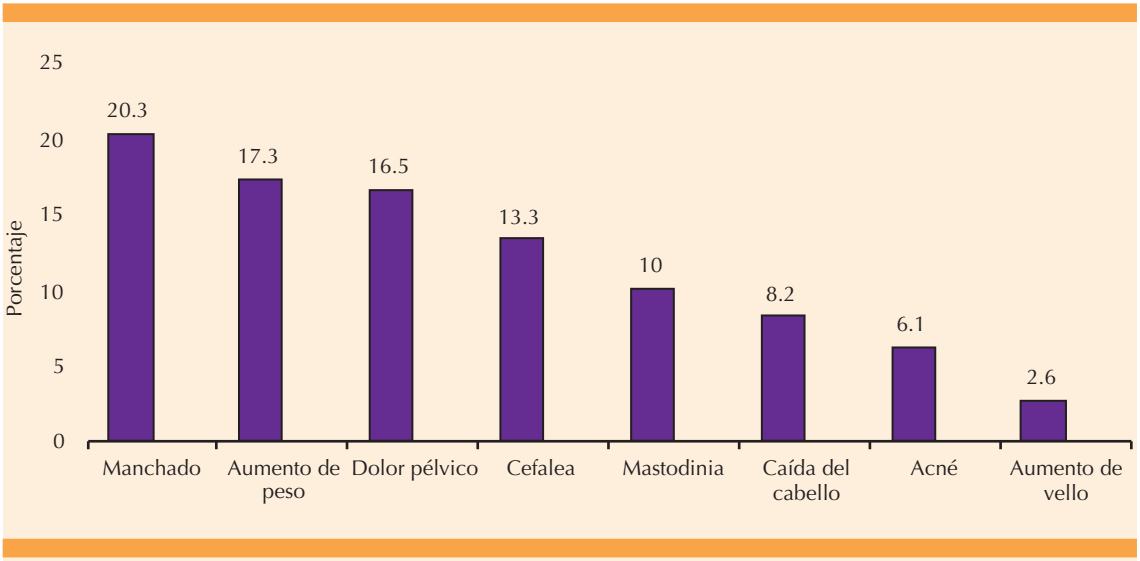



**Figure 1.** Main side effects reported with 52 mg LNG IUS .

of life, leading to assessment and treatment.[19] Despite the fact that the operational definition of heavy vaginal bleeding is bleeding over 80 mL, it doesn't have clinical utility in the treatment or prediction of adverse effects. This was evaluated in the study by Warner et al., who reported pain, mood changes, and the unpredictable start of periods, as commonly associated problems, more than absolute volume.[3]

Heavy menstrual bleeding represents an increase in the use of health care resources, including a high rate of surgical interventions. This leads to a decrease in work productivity and an increase in absenteesm.[20-21] A study made by Coté et al., with data from the National Health Interview Survey 1999, evaluated the effect of abnormal uterine bleeding on the use of health services by the 373 women who reported the problem, which led to more ambulatory and emergency medical visits, surgeries and prescriptions, than with women who reported mild bleeding.[2] In our study, 22% of the patients reported work absenteeism because of bleeding episodes. More than half of the patients showed anemia, which was reflected in medical expenses derived from the care given to the bleeding, and in losses associated to work productivity.

The PBAC (Pictorial Blood Assessment Chart) is a score that is used in research studies to try to quantify, in a more objective way, blood loss during menstrual periods, but some studies have not validated this method as an evaluation tool.[22] However, it has been used in other publications with precise results, so it can be a simple and economic tool, widely adopted in research and in clinical practice.[7,23] We used the PBAC in our study as the tool to establish with better precision the amount of bleeding, and thus, obtain more exact data from a statistical point of view.

According to NICE , the LNG-IUS is the most effective non-surgical treatment, despite the fact that the evidence to arrive at this conclusion is of low quality.[20] What is published here supports the outcomes as it shows the effectiveness of the treatment in patients with heavy menstrual bleeding.


https://doi.org/10.24245/gom.v92i6.9564

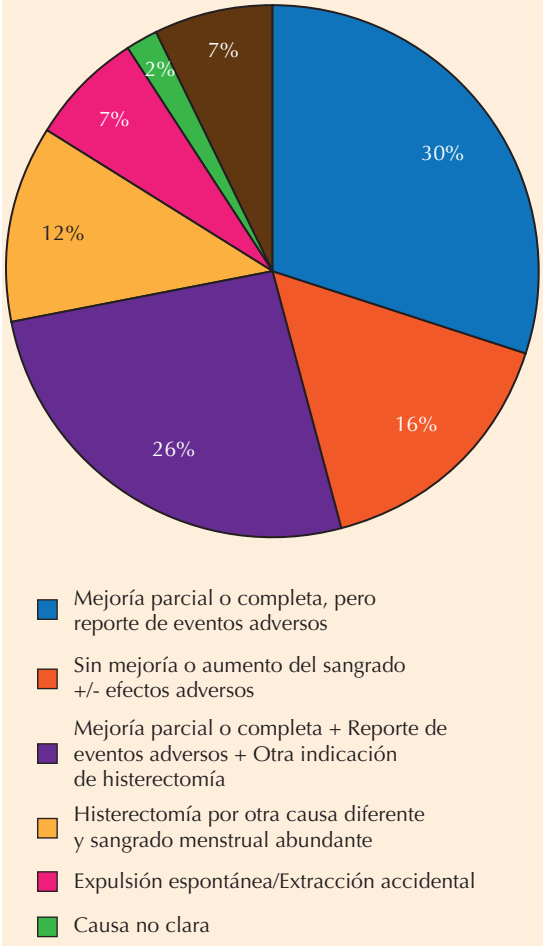



**Figure 2.** Indication for hysterectomy in the group of patients with treatment for abundant menstrual bleeding with 52 mg LNG IUS (n = 43).

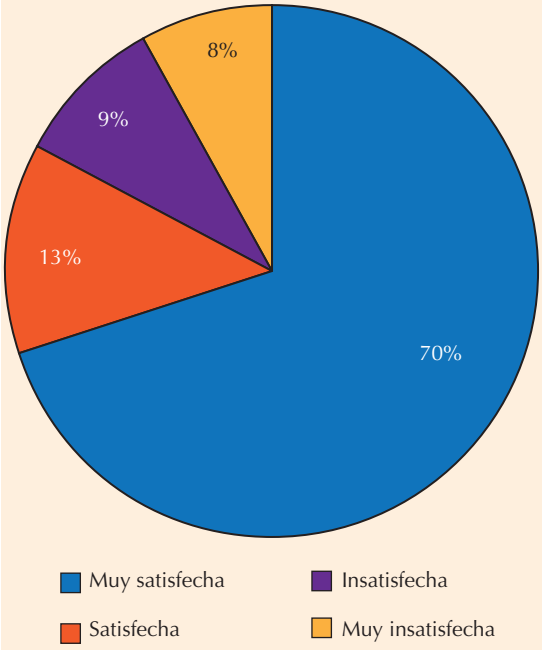



**Figure 3.** Percentual distribution of the degree of satisfaction with 52 mg LNG IUS for the treatment of heavy menstrual bleeding.

The LNG-IUS can be the first option for treatment in patients who don't have any identifiable condition, or who suffer from adenomyosis. Before the decision to accept the placement of the LNG-IUS, it is important to inform the patients that at least six cycles are required to show evidence of the benefit from changes in the bleeding pattern.[24]

Other medical treatment options are oral contraceptives, with limitations for patients at risk of venous thrombotic events, migraine with aura, and breast cancer. Progestins induce amenorrhea in 20 to 50% of those who receive them, but the response can be unpredictable, with some impact in the reduction of bone mineral mass with prolonged consumption. Tranexamic acid is also useful in acute treatment, without any effect in the length or regularity of the cycles.[20,25]

More than half of the patients in our study had received treatments before LNG-IUS, mostly combined oral contraceptives, and to a lesser extent, tranexamic acid, and injected contraceptives. At the time of the study, LNG-IUS is approved in Colombia as part of a benefit plan to treat patients with heavy menstrual bleeding; which is not associated with structural causes of the uterus, perhaps limiting the choice of this

method as a first option, in patients with some degree of myomatosis or adenomyosis.

The retrospective study by Mansukhani et al. assessed the efficacy of the LNG-IUS, and they found that staining was the main symptom at three months in 59.4% of the patients. At 6 months, 49.3% of the patients were asymptomatic, and at 18 months, 27.5% had amenorrhea. Only 14 patients required hysterectomy, due to symptom persistence, or the expulsion of the endoceptive. In our study, the rate of general satisfaction with the method was 80%.[15]

Pallavi et al. evaluated the efficacy of LNG-IUS in a conservative treatment for abnormal uterine bleeding, and they found that in 70 patients with a three-year follow-up, there was a decrease in blood loss (subjective measurement of the symptom as reported by the patient) of 80% of them at 4 months, 95% at one year, and amenorrhea in 100% of the patients at two years.[26-27] In our study, it was after 5 years of use that amenorrhea was reached in 32% of the patients.

Bitzer et al., in a systematic review of the bibliography of 17 studies which included 712 patients, and 10 non-randomized studies, which included 380 patients, reported a decrease in the PBAC score of over 70% within the first three months after the placement of the device, and the score continued decreasing during the first year of treatment, and it was maintained during the four years of its use.[27] Cim et al.'s study, which included the prospective evaluation with PBAC of 106 patients after the placement of the LNG-IUS, reported staining as the most frequent complaint at three months. At the end of the study, after 24 months, amenorrhea was reached with 17% of the patients, 51% reported infrequent cycles, 20% oligoamenorrhea, and 11% staining, with statistically significant differences between the results before and after the placement.[23]

We found in our study a statistically significant decrease in the length of the menstrual cycles, and in the days of bleeding, before and after the placement of the LNG-IUS. Almost half of the patients reached cycles between 24 and 38 days, but with a significant decrease in days of bleeding (less than 4 days), and the PBAC score.

Hysterectomy is still the most widely practiced gynecological surgical intervention in the world. At 60 years of age, 1 in every 60 women in the United Kingdom, and 1 in 3 women in the United States, have undergone this procedure.[28] While hysterectomy is the definitive treatment of abnormal uterine hemorrhage when other methods have failed. It is a major surgery that can be associated with severe risks of morbidity and mortality.[7,17]

A systematic revision by Matesson et al. (2012), compared hysterectomy with other alternative modalities of treatment for abnormal uterine hemorrhage. It included 236 patients treated with LNG-IUS and found an amenorrhea rate of 75% at 5 years. However, 42% discontinued its use because of intermenstrual bleeding, and abundant bleeding, which favored hysterectomy in relation with LNG-IUS as the final treatment to control bleeding in these patients. On the other hand, there were no significant differences in quality of life, pain, sexual health, and satisfaction.[29] The correct selection of patients reduces the failure rate with the method, and it also prevents an early removal of it.[16]

A systematic review published by Cochrane in 2016 compared the effectiveness, safety, and acceptance of the surgery with that of the medical treatment for abundant menstrual bleeding. When comparing hysterectomy with LNG-IUS, the hysterectomy group had a more objective control of bleeding, without evidence of a difference in quality of life. In that review, 46% of the patients assigned to LNG-IUS required


https://doi.org/10.24245/gom.v92i6.9564

hysterectomy,[1] unlike our study, where only 43 women out of 231 (18.6%) had to undergo the procedure. This shows a lower rate of hysterectomies that what is reported in previous studies, with a high percentage of satisfaction of the patients, and few reported side effects.

## CONCLUSION

This study results show that the LNG-IUS is an effective method to decrease abundant menstrual bleeding, with a high rate of satisfaction and tolerance. Only 18.6% of the patients had indication for hysterectomy due to lack of control of the bleeding, adverse effects, the apparition of other ailments, or expulsion. Thus, in adequately selected patients, it is an effective method for bleeding control, limiting the need for surgery, and its potential risks and complications. Further studies are needed to help define whether it is a cost-effective modality, and also prospective analyses that limit the probability of biases.

## AKNOWLEDGEMENTS

To the Del Prado Clinic for facilitating the information of the patients to effectively contact them.

## REFERENCES

1. Marjoribanks J, Lethaby A, Farquhar C. Surgery versus medical therapy for heavy menstrual bleeding. Cochrane Database Syst Rev 2016. https://doi-org/10.1002/14651858.CD003855.pub3
2. Côté PJ, Cumming DC. Use of health services associated with increased menstrual loss in the United States. Am J Obstet Gynecol 2023; 188 (2): 343-48. https://doi.org/10.1067/mob.2003.92
3. Warner PE, Critchley HO, Lumsden MA, Campbell-Brown M, et al. Menorrhagia II: is the 80-mL blood loss criterion useful in management of complaint of menorrhagia? Am J Obstet Gynecol 2004; 190 (5): 1224-29. https://doi.org/10.1016/j.ajog.2003.11.016.
4. Cheong Y, Cameron IT, Critchley HOD. Abnormal uterine bleeding. Br Med Bull 2017; 123 (1): 103–14. https://doi.org/10.1093/bmb/ldx027
5. Duffy J, Rolph R, Gale C, Hirsch M, et al. Core outcome sets in women's and newborn health: a systematic review. BJOG An Int J Obstet Gynaecol 2017; 124 (10): 1481-89. https://doi.org/10.1111/1471-0528.14694
6. Munro MG, Critchley HOD, Broder MS Fraser S, et al. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Int J Gynecol Obstet 2011; 113 (1): 3-13. https://doi.org/10.1016/j.ijgo.2010.11.011
7. Davies J, Kadir RA. Heavy menstrual bleeding: An update on management. Thromb Res 2017; 151: S70-S77. https://doi.org/10.1016/S0049-3848(17)30072-5
8. Munro MG. Practical aspects of the two FIGO systems for management of abnormal uterine bleeding in the reproductive years. Best Pract Res Clin Obstet Gynaecol 2017; 40: 3-22. https://doi.org/10.1016/j.bpobgyn.2016.09.011
9. Munro MG, Critchley HOD, Fraser IS. The two FIGO systems for normal and abnormal uterine bleeding symptoms and classification of causes of abnormal uterine bleeding in the reproductive years: 2018 revisions. Int J Gynecol Obstet 2018; 143: 393-408. https://doi.org/10.1002/ijgo.12666
10. Munro MG, Critchley HOD, Fraser IS. The FIGO classification of causes of abnormal uterine bleeding in the reproductive years. Fertil Steril 2011; 95 (7): 2204-2208.E3. https://doi.org/10.1016/j.fertnstert.2011.03.079
11. Munro MG, Critchley HOD, Fraser IS. Research and clinical management for women with abnormal uterine bleeding in the reproductive years: More than PALM-COEIN. BJOG An Int J Obstet Gynaecol 2017; 124 (2): 185-89. https://doi.org/10.1111/1471-0528.14431
12. Solnik MJ, Munro MG. Indications and alternatives to hysterectomy. Clin Obstet Gynecol 2014; 57 (1): 14–42. https://doi.org/10.1097/grf.0000000000000010
13. Palmara V, Sturlese E, Villari D, Giacobbe V, et al. Levonorgestrel-releasing intrauterine device in the treatment of abnormal uterine bleeding: a 6- and 12-month morphological and clinical follow-up," Aust. New Zeal. J Obstet Gynaecol 2013; 53 (4): 381-85. https://doi.org/10.1111/ajo.12097
14. Showstack J, Lin F, Learman LA, Hulley S, et al. Randomized trial of medical treatment versus hysterectomy for abnormal uterine bleeding: Resource use in the Medicine or Surgery (Ms) trial. Am J Obstet Gynecol 2006; 194 (2): 332–38. https://doi.org/10.1016/j.ajog.2005.08.014
15. Mansukhani N, Lin F, Learman LA, Hulley S, et al. Are women satisfied when using levonorgestrel-releasing intrauterine system for treatment of abnormal uterine bleeding? J Midlife Health 2013; 4 (1): 31. https://doi.org/10.4103/0976-7800.109633
16. Dueholm M. Levonorgestrel-IUD should be offered before hysterectomy for abnormal uterine bleeding without uterine structural abnormalities: there are no more excuses!. Acta Obstet Gynecol Scand 2009; 88 (12):1302-304. https://doi.org/10.3109/00016340903322776
17. Wheeler TL, Murphy M, Rogers RG, Bradley L, et al. Clinical practice guideline for abnormal uterine bleeding: hysterectomy versus alternative therapy. J Minim Invasive

Gynecol 2012; 19 (1): 81-88. https://doi.org/10.1016/j.jmig.2011.10.001

18. IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.
19. Whitaker L, Critchley HOD. Abnormal uterine bleeding. Best Pract Res Clin Obstet Gynaecol 2016; 34: 54-65. 2016. https://doi.org/10.1016/j.bpobgyn.2015.11.012
20. Côté I, Jacobs P, Cumming D. Work loss associated with increased menstrual loss in the United States. Obstetrics & Gynecology 2002; 100: 683-87. https://doi.org/10.1016/s0029-7844(02)02094-x
21. Liu Z, Doan QV, Blumenthal P, Dubois RW. A systematic review evaluating health-related quality of life, work impairment, and health-care costs and utilization in abnormal uterine bleeding. Value Heal 2007; 10 (3): 183-94. https://doi.org/10.1111/j.1524-4733.2007.00168.x
22. Reid PC, Coker A, Coltart R. Assessment of menstrual blood loss using a pictorial chart: a validation study. BJOG 2000; 107 (3): 320-22. https://org/10.1186/s12905-020-0887-y
23. Cim N, Soysal S, Sayan S, Yildizhan B, et al. Two years follow-up of patients with abnormal uterine bleeding after insertion of the levonorgestrel-releasing intrauterine system. Gynecol Obstet Invest 2018; 83 (6): 569-75. https://doi.org/10.1159/000480012
24. Heavy menstrual bleeding: assessment and management | Guidance | NICE. Published date: March 2018 Last updated: November 2018. https://www.nice.org.uk/guidance/ng88
25. Marnach ML, Laughlin-Tommaso SK. Evaluation and management of abnormal uterine bleeding. Mayo Clin Proc 2019; 94 (2): 326-35. https://doi.org/10.1016/j.mayocp.2018.12.012
26. 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. https://doi.org/10.4103/0976-7800.153615
27. Bitzer J, Heikinheimo O, Nelson AL, Calaf-Alsina J, et al. Medical management of heavy menstrual bleeding. Obstet Gynecol Surv 2015; 70 (2): 115-30. https://doi.org/10.1097/OGX.0000000000000155
28. Chen B, Ren DP, Li JX, Li CD. Comparison of vaginal and abdominal hysterectomy: A prospective non-randomized trial. Pak J Med Sci 2014; 3 (4): 875-79. https://doi.org/10.12669/pjms.304.4436
29. Matteson KA, Abed H, Wheeler TL, Schaffer JI, et al. A systematic review comparing hysterectomy with less-invasive treatments for abnormal uterine bleeding. J Minim Invasive Gynecol 2012; 19 (1): 13-28. https://doi.org/10.1016/j.jmig.2011.08.005


https://doi.org/10.24245/gom.v92i6.9564